# Training the Next Generation of Practitioners In Early Intervention and Telepractice: Three University Models

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## Abstract

The COVID-19 pandemic continues to shape the provision of family-centered early intervention services for children who are deaf or hard of hearing and their families. In programs, schools, and centers, direct in-person contact with families has been significantly curtailed as a means to limit the exposure to and spread of the virus. Emergency remote learning has led to an increase in telepractice, also referred to as tele-intervention, as the designated model of service provision. Most early interventionists, speech-language pathologists, and teachers of the Deaf were not sufficiently trained to suddenly implement emergency remote teaching or telepractice services. Service providers had no option but to forge ahead with the provision of services, often with limited or no prior knowledge and experience, using only telecommunications technology. Fortunately, however, some university training programs have integrated telepractice into their curricula and practica experiences for many years, and three of those programs are profiled here.

**Keywords:** university training, personnel preparation, graduate training, speech-language pathology, Deaf Education, family-centered early intervention, telepractice, tele-intervention

**Acronyms:** DHH = deaf or hard of hearing; LSL = listening and spoken language; SLP = speech-language pathologist; TDHH = teachers of the deaf and hard of hearing; TI = tele-intervention

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The COVID-19 pandemic has forced state early intervention programs, public schools, and other service providers to shift their models of service delivery and instruction to online, synchronous tele-intervention, telepractice, and distance learning services[1]. Whereas, emergency remote teaching and telepractice services helped to mitigate the spread of the virus, most early intervention providers, especially teachers of the deaf and hard of hearing (TDHH) and speech-language pathologists (SLP), lacked the necessary knowledge and skills to effectively deliver these services. Given the public health crisis, these professionals had to suddenly embrace the task at hand and become remote teachers and telepractitioners with little or no prior preparation.

For nearly two decades, the American Speech-Language-Hearing Association (ASHA) has recognized telepractice as a viable and appropriate service delivery model (ASHA, 2005a, 2005b). However, in a recent study, only 5% of respondents who were practicing speech-language pathologists reported using telepractice service delivery models prior to the pandemic (ASHA, 2020a). By May 2020, precautions brought on by Covid necessitated that 84.8% of speech-language pathologists were using telepractice service delivery models and more than half, 56%, found the experience to be challenging (ASHA, 2020b; Campbell & Goldstein, 2021). Likewise, most graduate training programs in Speech-Language Pathology and Audiology offered little or no instruction or practica in telepractice prior to the pandemic (Behl & Kahn, 2015; Grogan-Johnson et al., 2015; Wilson & Seal, 2015). Similarly, tele-intervention services have been shown to be quite effective and efficient when serving young children who are deaf or hard of hearing (DHH) and their families (Behl et al., 2017; Blaiser et al., 2013; Houston & Stredler-Brown, 2012; McCarthy et al., 2018). However, Jackson and colleagues (2015) found that most service providers with a Deaf Education background lacked sufficient training in the use of distance technology to deliver family-centered early intervention and other remote instruction, and the researchers posited that university training programs had to do more to incorporate these competencies into their curricula prior to graduation.

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[1]For the purposes of this article, the terms "tele-intervention" and "telepractice" will refer to the use of distance telecommunication technology to deliver family-centered services to children who are deaf or hard of hearing and their families.

Three university training programs, two in Speech-Language Pathology and one in Deaf Education, are presented as models of preservice preparation. Each of these programs have incorporated tele-intervention service delivery into their curricula, practica, and field-based experiences for over a decade. Although faculty continue to refine the academic content in each program as new technologies, policies, regulations, and digital resources evolve, the three university programs—the University of Akron, Utah State University, and Idaho State University—ensure that their graduates develop the competencies to serve children who are DHH through in-person sessions, tele-intervention, and hybrid models. With these competencies, graduates can tailor their service provision to meet the individual needs of each child and family on their caseload.

### Telepractice and eLearning Laboratory, Audiology and Speech Center, School of Speech-Language Pathology and Audiology, University of Akron (Akron, OH)

The Telepractice and eLearning Laboratory (TeLL) was established in 2011 within the Audiology and Speech Center in the School of Speech-Language Pathology and Audiology at the University of Akron. Graduate students participating in the TeLL develop knowledge and clinical competencies in meeting the listening and spoken language needs of young children who are DHH through family-centered early intervention services while, at the same time, learning to deliver services through in-person, telepractice, and hybrid models. In 2012, the Graduate Studies Program in Listening and Spoken Language (GSPLSL), a personnel preparation grant (Houston, 2012-2018, H325K120356) funded through the Office of Special Education Programs (OSEP) at the U.S. Department of Education, was established to provide specialized training to graduate students in meeting the communication needs of young children who are DHH. The goal was to ensure that students could deliver appropriate services whether the families chose in-person services, synchronous telepractice sessions, or a hybrid model. With the establishment of GSPLSL, two new courses were added to the curriculum for graduate students funded on the grant. The first course focused on the foundational knowledge and skills of meeting the listening and spoken needs of young children who are DHH, and the second course was devoted to the delivery of telepractice services.

Building on the success of the GSPLSL, a second personnel preparation grant was funded in 2021 (Houston & Meibos, H325K210083, 2021-2026) by OSEP in the U.S. Department of Education. This new funding establishes the Interprofessional-Hearing Early Access Response Through Telepractice (I-HEART) Project. At a minimum, the I-HEART Project will train 30 graduate students, 20 in Speech-Language Pathology and 10 in Audiology. The primary goals of the project are focused on students learning to work interprofessionally to serve young children who are DHH and their families through telepractice,

in-person, and hybrid models. Students selected to participate in the project have specific competencies that are required to be mastered in interprofessional practices such as those delineated by the Interprofessional Education Collaborative (2016). Those competency areas are described as follows:

- Values/Ethics: Work with individuals of other professions to maintain a climate of mutual respect and shared values;
- Roles/Responsibilities: Use the knowledge of one's own role and those of other professions to appropriately assess and address the healthcare needs of patients and to promote and advance the health of populations;
- Interprofessional Communication: Communicate with patients, families, communities, and professionals in health and other fields in a responsive and responsible manner that supports a team approach to the promotion and maintenance of health and the prevention and treatment of disease; and
- Teams & Teamwork: Apply relationship-building values and the principles of team dynamics to perform effectively in different team roles to plan, deliver, and evaluate patient/population-centered care and population health programs and policies that are safe, timely, efficient, effective, and equitable.

Similarly, the students obtain competencies in evidence-based practices that support the delivery of family-centered early intervention (ASHA, n.d.a; n.d.b); Moeller et al., 2013; NCHAM, 2021) and those that support listening and spoken language outcomes for children who are DHH (AG Bell Academy of Listening and Spoken Language, 2022). The Nine Domains of Knowledge are:

- History, Philosophy, and Professional Issues
- Education
- Emergent Literacy
- Hearing and Hearing Technology
- Auditory Functioning
- Spoken Language Communication
- Child Development
- Parent Guidance, Education, and Support
- Strategies for Listening and Spoken Language Development

And finally, the students must achieve competencies in telepractice service delivery, and those competencies are delineated in five domains: (a) Speech-Language Pathology and Audiology, (b) Ethical, Legal, and Reimbursement Policies, (c) Technology Used for Telepractice Service Delivery, (d) Practice: Delivering Telepractice Services, and (e) Sustainability. These five domains are further explored in Table 1. (These competencies were adapted from ASHA's Telepractice Knowledge and Skills; 2005a; ASHA's Telepractice Portal, n.d.b; as well as from Brennan et al., 2010; Houston, 2013; Lowman, 2017; Lowman et al., 2022; Richmond et al., 2017; McCarthy, 2013; Walker, 2015.)

The I-HEART Project co-directors and other faculty will continue to refine these telepractice competencies as new policies are implemented, changes to licensure occur, new technology platforms are developed, and when innovative digital resources are created and published. (For a more thorough discussion of telepractice competence, please see Lowman et al., 2022.)

Prior to the start of classes in August of each year, grant scholars attend a mandatory three-day intensive workshop focused on telepractice. Students learn the basic knowledge and skills of telepractice service delivery, from the types of technology used to planning and executing simulated telepractice sessions with their peers. Students assigned to the TeLL, during their in-house rotation, attend a weekly clinical seminar designed to support their telepractice clinical experience. Students discuss cases, troubleshoot technology challenges, and collaborate on developing digital activities to support the treatment goals addressed in their sessions.

**Table 1**

*Telepractice Service Delivery Core Competencies: Interprofessional-Hearing Early Assessment Response Through Telepractice (I-HEART Project)*

| DOMAIN | PURPOSE |
|---|---|
| Domain 1: Speech-Language Pathology & Audiology | Knowledge and skills related to identification, assessment, and treatment of hearing and speech-language disorders across the lifespan. |
| | Competencies/Goals:<br>1. Students remain in good standing within their plan of study and/or discipline—both academically and clinically.<br>2. Students demonstrate how to use appropriate assessment and treatment knowledge and skills, depending on the diagnosis.<br>3. Students continue to gain competence and independence across the Big Nine clinical areas as defined by the American Speech-Language-Hearing Association (ASHA). |
| Domain 2: Ethical, Legal, & Reimbursement | Knowledge and skills related to ethical, legal, and reimbursement issues, mandates, and responsibilities related to telepractice. |
| | Competencies/Goals:<br>1. Students will demonstrate knowledge and skills related to telepractice service delivery models as defined by the American Audiology Association (AAA).<br>2. Students will demonstrate knowledge and skills related to Health Insurance Portability and Accountability Act of 1996 (HIPAA), Family Educational Rights and Privacy Act (FERPA), the Health Information Technology for Economics and Clinical Health Act (HITECH), and other federal laws and policies related to telepractice service delivery.<br>3. Students will demonstrate the knowledge and skills of state policies and licensure requirements related to telepractice service delivery.<br>4. Students will demonstrate the knowledge and skills regarding informed consent of clients and families when providing telepractice services.<br>5. Students will demonstrate the knowledge and skills related to ethical practice within telepractice as defined by ASHA, AAA, and the American Telemedicine Association (ATA)—as well as other related sources.<br>6. Students will demonstrate the knowledge and skills related to Medicare, Medicaid, and third-party reimbursement for telepractice services. |
| Domain 3: Technology Used For Telepractice Service Delivery | Knowledge and skills specific to the selection, set-up, use, and troubleshooting of teleconferencing/telepractice equipment and connectivity. |
| | Competencies/Goals:<br>1. Students will demonstrate the knowledge and skills to effectively plan and select telepractice equipment that will meet the service delivery needs of the populations served.<br>2. Students will demonstrate the knowledge and skills to set up telepractice equipment for successful service delivery.<br>3. Students will demonstrate the knowledge and skills to troubleshoot telepractice equipment (e.g., computer, monitor, audio, video, etc.) when problems occur.<br>4. Students will demonstrate the knowledge and skills to effectively troubleshoot connectivity/bandwidth issues that may occur.<br>5. Students will demonstrate the knowledge and skills to effectively use telepractice equipment for the delivery of telepractice services.<br>6. Students will demonstrate the knowledge and skills to connect other peripheral devices to the telepractice equipment for use in clinical assessment and treatment sessions. |

**Table 1 continued**

| DOMAIN | PURPOSE |
|---|---|
| Domain 4: Practice: Delivering Telepractice Services | Knowledge and skills related to the selection of clients, implementation of assessment and intervention practice in a tele-environment, progress monitoring, and setting considerations. |
|  | Competencies/Goals:<br>1. Students will demonstrate the knowledge and skills for selecting clients who are appropriate for telepractice service delivery.<br>2. Students will demonstrate the knowledge and skills for obtaining appropriate informed consent and maintaining confidentiality and privacy of patient contact and interactions within telepractice service delivery.<br>3. Students will demonstrate the knowledge and skills to complete appropriate audiological, speech, or language assessments through telepractice service delivery models.<br>4. Students will demonstrate the knowledge and skills to provide family-centered early intervention through telepractice service delivery models.<br>5. Students will demonstrate the knowledge and skills of adult learning practices when providing parent coaching and other assessment or treatment activities through telepractice service delivery models.<br>6. Students will demonstrate the knowledge and skills to set up the professional's telepractice space or setting, especially in the layout of the equipment, lighting, and audio that are adequate for telepractice service delivery.<br>7. Students will demonstrate the knowledge and skills to advise the client/parents on appropriate set up and in-home setting for optimal telepractice service delivery.<br>8. Students will demonstrate the knowledge and skills to develop digital materials to be used in the assessment and treatment of hearing, speech, and language disorders. |
| Domain 5: Sustainability | Knowledge and skills related to building and sustaining a telepractice model. |
|  | Competencies/Goals:<br>1. Students will demonstrate the knowledge and skills to conduct a needs assessment to determine the feasibility of a telepractice program.<br>2. Students will demonstrate the knowledge and skills to conduct outreach to community stakeholders related to telepractice service delivery.<br>3. Students will demonstrate the knowledge and skills to develop a business plan to support a telepractice service  program.<br>4. Students will demonstrate the knowledge and skills to effectively evaluate telepractice program service delivery and outcomes |

Since the TeLL was launched, the commitment to telepractice has permeated the graduate program. Faculty now discuss how a client with a specific diagnosis (e.g, hearing loss, fluency disorders, voice disorder, speech or language delays, etc.) can be served through in-person, telepractice, and hybrid models. All graduate students complete at least one semester of telepractice experience in the Audiology and Speech Center clinic with additional experiences gained through community placements, such as the local children's hospital, public schools, and private practices.

### Utah State University Interdisciplinary Graduate Training Program for Deaf Education, Speech-Language Pathology, and Audiology Students (Logan, UT)

The Listening and Spoken Language (LSL) graduate training program at Utah State University (USU) is a comprehensive interdisciplinary program for Deaf Education, SLP, and Audiology students to gain skills and competencies in providing family-centered, evidence-based services for children who are DHH to learn to listen and talk. Students from all three disciplines take many of the same LSL courses, attend a weekly interdisciplinary seminar together, and work alongside one another to complete practicum experiences every semester of their graduate program. Audiology and SLP students participate in the LSL program as an *emphasis*, consisting of extra coursework and practicum in addition to completing all requirements associated with the core Audiology or SLP programs of study. The LSL Deaf Education program is not an emphasis but is a full stand-alone Master of Education and Teacher Licensure program. The Deaf Education program is available to campus-based students and to distance students, contingent upon distance students having access to an approved practicum site. The Audiology and SLP programs are accredited by the American Speech and Hearing Association and the LSL Deaf Education program is accredited by the Council on Education of the Deaf. Since 2012, the USU program has provided students

with tuition support funded through the Office of Special Education Programs (OSEP) personnel preparation training grants at the U.S. Department of Education.

The fundamental philosophies and priorities of the Interdisciplinary LSL Deaf Education program were guided by, and carefully mapped to, the national standards for teacher preparation and the principles of evidence-based practices outlined by the Council for Exceptional Children (CEC) and the Council on Education of the Deaf (CED) national standards for serving children who are DHH and their families (2018/2019). The LSL coursework was also informed by the knowledge and skills recommended by the Division for Early Childhood (DEC) personnel standards (2017) and by Moeller et al. (2013) specific to serving children ages birth to three who are DHH and their families. The program is routinely evaluated to ensure the nine domains critical to LSL development, identified by the Alexander Graham Bell (AGBell) Academy for Listening and Spoken Language are effectively embedded in the curriculum. The priorities emphasize (a) family-centered services founded on trust and assurance that the provider will take the time to learn the parents' priorities for their child and to understand what is important to them and their family; (b) use of parent coaching to support development across environments and daily routines aligned with the family's needs and preferences; (c) culturally competent services that address the diverse cultural and linguistic needs of children who are DHH and their families, including Deaf Culture and continuum of family preferences; (d) a comprehensive understanding of the auditory hierarchy and the use of effective LSL strategies to maximize auditory perception development; (e) priorities in development language and literacy foundations that are fundamental to all other aspects of a child's academic experiences; (f) an understanding of audiology and hearing technology concepts; and (g) goal-oriented, data-driven services through interdisciplinary collaboration.

To ensure students develop breadth of competencies, the program includes both synchronous and asynchronous coursework as well as practicum placements each semester in various service delivery settings, such as the classroom, individual therapy, early intervention, parent-infant toddler groups, and the audiology clinic. Deaf education and SLP students also have at least one full semester of providing services of using a tele-intervention (TI) mode of delivery, with most students having a TI placement for two full semesters. Long before the COVID-19 pandemic forced educators to provide emergency virtual services, the USU-LSL graduate training program was providing TI to families of children who are DHH in a variety of locations across the United States. Students at USU learn the TI model can provide easier access for parents to receive services regardless of their location, may offer more flexibility around work schedules, and can provide specialized services from trained providers who understand LSL strategies and priorities.

In addition to experiencing the positive aspects of the TI model, students must also recognize the potential challenges in a TI delivery and the adaptations and competencies that facilitate successful services. Similar to center-based or in-person services, students must learn to build and maintain trust and rapport as they help guide parents in promoting their child's development within daily routines and according to family priorities (Early Childhood Technical Assistance Center, 2017). However, many students initially express trepidation or a lack of confidence in knowing how to promote a strong parent-professional relationship via a virtual connection. To prepare students for their TI placement, the use of role-play between students and supervisors is a strong training tool for TI sessions. For example, guidance and practice in using question prompts that promote conversation to build the relationship rather than those that prompt single-answer or yes/no responses can facilitate student readiness for their first TI session. This can be particularly valuable given there are not the same contextual cues or conversation-starters in a TI session that are typically available with in-person services, such as commenting on how beautiful the home is or a photo on the wall. In addition to building rapport, students learn these initial conversations are informative to learning about family activities, daily routines, or other priorities that can be incorporated into intervention plans. Similarly, students must learn to be good listeners and be mindful of their non-verbal behaviors. Although these skills are equally essential for in-person services, poor development in both expressive and receptive communications may be more noticeable or distracting when providing TI services than are apparent when parents and providers are in the same physical space. With parent permission, TI sessions that are recorded can facilitate valuable opportunities for students to engage in self-reflective learning as they and their supervisors watch the recording, and make time-stamped observations using a program such as GoReact (i.e., taking note of their body language, attentiveness, facial expressions, conversational effectiveness, or other verbal and non-verbal behaviors that may positively or negatively impact the TI session).

Priorities of goal-oriented, family-centered services are the same whether delivering services via TI or in-person. Students must learn the coaching model (Rush & Shelden, 2019) and prepare for sessions that match the family's naturally occurring routines in the home and are flexible in making seamless adaptations to those plans when necessary (NCHAM, 2021; Poole et al., 2020). In fact, at USU the documents developed for early intervention preparation are referred to as *Family Session Planning Guides* rather than lesson plans to reinforce the concept of family-focused services and not implementation of rigid or pre-determined lesson plans. The need to be flexible, with skills to adapt the session focus, is emphasized in the TI practicum since many families may wish to engage in sessions while on vacation, at the park, or other various non-traditional locations. This can be intimidating for some students as they experience the necessity of developing strong competencies in auditory perception, speech, and language development hierarchies and the ability to think on their feet as they adapt their coaching strategies

consistent with the session details or circumstances. Yet, within a short time, most students report this variability in TI services to be highly enjoyable as it promotes rich and authentic learning experiences.

To provide goal-oriented services, students must develop skills and competencies in administering and interpreting standardized, non-standardized, and curriculum-based assessments, and then interpreting findings to provide individualized instruction specific to the needs of each child. Assessment can be challenging when using a TI mode of delivery (see Blaiser et al., 2022 in the present monograph), however, developing competencies in obtaining appropriate assessment data in TI services is critical to graduate training experiences. Students learn strategies for collecting and using language samples to monitor growth across developmental domains, using electronic versions of standardized assessments, and other developmental checklists or curriculum-based assessments. In other words, delivering services using a TI model does not preclude the priorities for collecting data and providing data-driven services. Students gain skills in recognizing how assessment data, combined with their breadth of knowledge in effective service delivery, clinical judgement, and a diagnostic teaching approach, can facilitate partnering with parents to implement services that are developmentally appropriate and address the needs and priorities of each child and family.

Supporting parents in understanding, managing, and troubleshooting their child's hearing technology is also an important component of being a service provider for children who are DHH and their families. Providing hearing technology support through a virtual connection may seem daunting to students or professionals who are new to a TI model of delivery, however, students quickly learn they can be highly successful in providing support in hearing technology management through the virtual connection. For example, students should be prepared with similar listening check or troubleshooting materials on their end as those being used by the parents. Having a listening tube or stethoscope along with a mock hearing aid to use as demonstration can offer parents more specific and effective guidance than attempting to verbalize instructions without any visual support. There are also many picture and video materials available on manufacturer websites that provide training and guidance. Students are cautioned that simply advising the family to check the manufacturer website is not consistent with a family-centered approach, as the volume of electronic resources available to families can be overwhelming, with challenges in finding the information specific to their child's technology. Parents may similarly benefit from guidance in understanding the importance of creating an optimal acoustic environment, including suggestions and strategies specific to their child, home, and family. This guidance can occur as seamlessly and effectively using a virtual connection as can occur with in-person services.

For all practicum experiences at USU, students are placed with master-level Deaf Educators or SLP's who either provide the direct services or they provide nearly 100% supervision as students deliver services. This model supports students in developing the breadth and depth of skills outlined in national standards for professional competencies. Deaf education, SLP, and audiology students learn together as a collaborative cohort and develop discipline-specific skills to serve children who are DHH and their families in providing in-person or TI services. Including TI in graduate student training is essential to ensure future professionals gain competencies to effectively serve families who benefit from the TI model.

### Idaho State University Speech-Language Pathology Graduate Program (Meridian, ID)

Because a substantial proportion of Idaho is considered rural, it is necessary to train students in the Idaho State University (ISU) Speech-Language Pathology graduate training program best practices related to telepractice. ISU's American Speech-Language Hearing Association (ASHA) accredited program, enrolls approximately 60 SLP graduate students each year in two in-person cohorts (Meridian and Pocatello) and one online cohort.

In 2015, the ISU HATCH (Helping Adults Talk to Children) Lab developed a telepractice-based curriculum for students and professionals who were serving children who are DHH. This curriculum was developed to be an interactive supplement to the free online curriculum offered by the National Center for Hearing Assessment and Management (www.ti101.org). The HATCH lab curriculum focused on family coaching as a central tenet to the telepractice curriculum, with interactive, asynchronous opportunities to experience and compare the effectiveness (or non-effectiveness) of different coaching techniques.

Since Spring of 2020, there has been a needed shift to integrate telepractice across coursework, clinical practicum, and research for the entire SLP program. ISU has highlighted the following ways to integrate telepractice across three primary areas: coursework, clinical experiences, and research. Key competencies identified for graduate students using telepractice include ability to:

- navigate and effectively use a variety of technology platforms;

- identify key aspects of assessment and intervention for a variety of clinical populations;

- use technology and resources to effectively meet assessment and intervention needs;

- integrate interprofessional and family collaboration into service delivery; and

- find, evaluate, and adhere to current best practice guidelines for the profession.

### Coursework

Telepractice has been integrated into the SLP graduate curriculum as part of graded activities. Coaching and reflection assignments are given and concentrated

instruction and discussion time are allotted in courses for telepractice assessment and invention issues students may face. Students learn about equipment/setup (including greenscreen, microphones/headsets, etc.), presentation of materials (slide sharing so presenter remains on the main screen), engaging activities, working with facilitators to elicit speech sounds in children, and behavior management. Instead of focusing on one teleconferencing platform, the ISU program supports students' exploring and experiencing the fundamentals of platforms in general. This is particularly important when professionals will be responsible for providing services to clients within different districts or organizations that may have chosen different platforms for a variety of reasons.

Coursework specific to working with children who are DHH has been developed for providers using telepractice and/or in itinerant models. For example, students explore case studies that use telepractice as a way to virtually connect for interprofessional teaming. Students also have the opportunity to observe in different classroom settings via telepractice to provide comments/feedback. Students involved with ISU's Helping Adults Talk to Children (HATCH) Lab have been exposed to the process of data collection measuring the effectiveness of telepractice with young children who are DHH. In one study, families received weekly educational courses to support child language (Blaiser et al., 2016; Weitzman & Blaiser, 2018). Results of these studies demonstrated high satisfaction with families who participated (i.e., of seven families who piloted the project, 100% rated satisfaction as *high* or *very high*).

### Clinical Experiences

Students provide services to clients throughout the lifespan via telepractice. To obtain additional clinical expertise prior to serving clients, students participate in Simucase (virtual case studies), lab meetings dedicated to telepractice training, and collaborative efforts to identify and share resources for telepractice for different clinical populations. Clinical faculty developed role play activities for students to rehearse key aspects of assessment and intervention via telepractice (Woods et al., 2021). SLP students participate in a Telepractice Showcase to share creative methods they developed/implemented within sessions to facilitate client participation, motivation, and efficiency and effectiveness of therapy. These clinical resources and demonstrations are shared with students and faculty and with the statewide preceptors who may have been required to integrate telepractice into service delivery without training.

For intervention for children who are DHH, telepractice often needs to encompass auditory access through hearing technology (i.e., wearing the correct hearing technology, the ability to troubleshoot connection through bluetooth, correct settings of FM/DM system) through collaboration with an educational/clinical audiologist and/ or Teacher for the DHH. Graduate students learn how to modify and enhance visual cues for children who are DHH (particularly in speech production intervention) such as making the camera screen as big as possible. In-person facilitators have been useful in providing additional

models and feedback to the SLP such as correct/incorrect productions of high frequency sounds that are not always heard via Zoom.

### Research

ISU's graduate students have opportunities to participate in research examining assessment and intervention protocols via telepractice. For example, ISU's HATCH and Child Language Labs have been examining the effectiveness of language sample collection and analysis via Zoom for school-age children with and without language impairments as well as preschool children who are DHH. Faculty are investigating telepractice as a way to increase intensity of service delivery with children with Speech Sound Disorders with hearing children and children who are DHH.

Telepractice has become commonplace for many providers, many of them who initiated practice without warning and/or training. With telepractice integrated into coursework, clinical experiences, and development of evidence-based clinical best practice, a future generation of clinicians will have the tools to provide high-quality services to individuals with communication disorders regardless of their geographic location.

### Conclusion

The COVID 19 pandemic has taught us a great deal about how we, as a society, can tolerate a worldwide health crisis. Because of emergency remote teaching and learning, professionals had to quickly pivot to online platforms to deliver early intervention, instructional, or clinical services. More importantly, the viability of these online platforms and the effectiveness of tele-intervention and telepractice service delivery models for diagnostic, treatment, and intervention services have been proven, with favorable results for most populations served. As we look forward, the demand for tele-intervention and telepractice services will continue to grow and expand. University training programs will need to do more to integrate telepractice-related content, practica, and competencies into their curricula so that new graduates will be fully prepared to seamlessly move between in-person to telepractice service delivery whenever it is required. These three university programs have developed models for other universities to follow.

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