Massachusetts Teachers of Deaf and Hard of Hearing Students:

A Mixed Methods Workforce Analysis

A Dissertation Presented

by

KYM PHELAN MEYER

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College of Education

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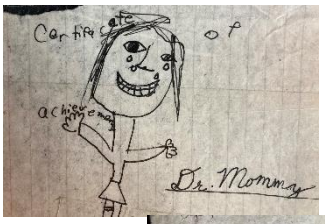
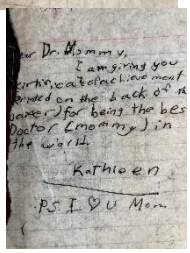
DEDICATION

To my unbelievably supportive family, this entire process and publication is dedicated to you. I wouldn't have this degree without your encouragement and understanding.

Eric – 35 years ago this week (you know the date), you showed up to the library without books, and have been my love and my light ever since. Thank you for being a wonderful partner in life and the best dad to “the them.” And for tacos. And for always picking up my favorite moscato without asking.





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ABSTRACT

MASSACHUSETTS TEACHERS OF DEAF AND HARD OF HEARING STUDENTS:

A MIXED METHODS WORKFORCE ANALYSIS

FEBRUARY, 2021

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Massachusetts has a severe shortage of teachers of the deaf and hard of hearing (TODHH) and there is only one deaf education graduate program in the six New England states. The purpose of this study was to survey every currently working teacher of deaf and hard of hearing (DHH) children in Massachusetts to understand the makeup of the Massachusetts deaf education workforce and gather teacher ideas for retention and recruitments of teachers of DHH children. This mixed-methods sequential explanatory design collected Phase One data through a statewide survey, identifying where Massachusetts teachers are working, how they decided to work in this field, the challenges they encounter, and satisfaction with different aspects of their work. Phase Two of the study used data learned from the survey to develop semi-structured interview questions of teachers of different demographic groups, using maximal variation sampling, including employment type (early childhood, elementary, secondary, itinerant), teacher deafness status (Deaf, hard of hearing, hearing), and the language of instruction (American Sign Language or spoken English). The data from both phases were

integrated to identify the reasons that bring teachers into deaf education, the challenges to becoming a certified TODHH in Massachusetts, identifying satisfaction level of different demographic groups of Massachusetts TODHHs, and collected ideas for recruiting and retaining TODHHs to address the teacher shortage. Barriers to recruitment identified that many hearing TODHHs learned of their profession by accident, usually when some chance encounter steered them toward deaf education. Teachers shared ideas for publicly promoting the profession. Retention issues addressed concerns of teachers not feeling supported and disparate pay issues between private schools for DHH students and public schools. A policy implications section connects research analysis to practice and implementation from federal, state, and local policy perspectives.

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INTRODUCTION

Separate schools that serve deaf and hard of hearing (DHH) children in Massachusetts report not having enough teachers of the deaf and hard of hearing (TODHHs) to serve their students. Massachusetts public schools also report not having the TODHHs they need to serve students in inclusive settings (D. Martin, personal communication, February 16, 2019; Meyer & Martin, 2019). An often-cited article in the deaf education literature "Demographics of Deaf Education: More Students in More Places" refers to DHH students increasingly educated across the continuum of educational placements (Mitchell & Karchmer, 2006; Mitchell, 2017). Regardless of the location of instruction, teachers who understand their unique needs are required to follow them.

> Because deafness is a low incidence disability, there is not widespread understanding of its educational implications, even among special educators. This lack of knowledge and skills in our education system contributes to the already substantial barriers to deaf students in receiving appropriate educational services. (U.S. Department of Education, 1992, p. 2)

The Task Force on the Teacher of the Deaf/Hard of Hearing Shortage was established in 2017 by the Massachusetts Commission for the Deaf and Hard of Hearing (MCDHH) Steering Committee, and is led by David Martin, PhD, Professor Emeritus of Gallaudet University. I participate as a member of this group. The Task Force is comprised of representatives of schools and programs for DHH children throughout the Commonwealth. During the 2017-2018 school year, the Task Force had four meetings, with two reports to the Steering Committee (of which a representative from the

Massachusetts Department of Elementary and Secondary Education attends) (D. Martin, personal communication, July 16, 2018). However, to date, the only documented evidence of the shortage is a national study completed by The Conference of Educational Administrators of Schools and Programs for the Deaf (CEASD), which surveyed self-contained schools for the deaf and programs that serve large numbers of DHH students who use sign language in school (Tucker & Fischgrund, 2018). Recently the Task Force sent a survey to every MA school including schools/programs for deaf students, public, charter, and private schools. The results showed that 32.5% of respondents had difficulty providing services with TODHHs within the past two school years. Twelve school districts (or 6% of the total 203 respondents) reported they had TODHH vacancies they were unable to fill at all during the 2017-2018 school year (Meyer & Martin, 2019). Beyond documenting that there is a shortage of TODHHs in Massachusetts, what do we do about it?

More students in more places

A number of publications have attempted to document the demographic data describing the heterogeneity of DHH students and where they are being educated (Mitchell, 2017; Shaver, et al., 2014; Mitchell & Karchmer, 2006; Cawthon, 2006; Mitchell, 2004; Holden-Pitt & Diaz, 1998). Researchers have culled data from documents such as the *Special Education Elementary Longitudinal Study* (*SEELS*) (Blackorby & Knockey, 2006), the *Gallaudet Research Institute Annual Survey of Deaf and Hard of Hearing Children* (Gallaudet Research Institute [GRI], 2011, which is no longer being collected), and the *Individuals with Disabilities Education Act Child Count* (U.S. Department of Education, 2017). The organizations that establish these documents have

different mandates and focuses—they count students with varying levels of hearing loss, identify hearing assistive technology used, try to figure out who communicates using American Sign Language and/or listening and spoken language, whether they have associated disabilities, and the location of where they are educated.

The demographics are explicit: DHH children are increasingly being educated in general education schools. The most recent federal Child Count reports that in Massachusetts 66.5% of special education students with a primary diagnosis of hearing loss are educated within regular education classrooms for some part of their school day, and 30.27% of these students are educated in separate schools (U.S. Department of Education, 2017). But we do not have information about how these students learn, language/communication methods used, whether they have additional disabilities, or use technology such as hearing aids or cochlear implants. TODHHs need to be knowledgeable about all these topics if they are to provide the students with an appropriate education. As DHH students are educated in dispersed locations, the specialized instruction needs to follow them.

Specialized teacher training

Special education is an all-encompassing training program for teachers of children with varying disabilities. Students who major in special education can be expected to work with children with a variety of needs, including students with autism spectrum disorders, learning challenges, and emotional disabilities. TODHH have a specific skill set unique to the needs of DHH students, which are not taught in other special education training programs. Understanding the nuanced needs of many of these children is beyond the scope of a special education teacher training program. There are a number of

knowledge and skills, practice documents, and guidelines which outline the specialized training of TODHHs to meet the needs of DHH students.

Beginning in the 1990's, the Council for Exceptional Children (CEC) and the Council for Education of the Deaf (CED) worked together to identify the knowledge and skills for new graduates of TODHH preparation programs (Easterbrooks, 2008a). In 2008, these organizations collaborated to revise the initial set and develop advanced sets of standards in order to provide effective instruction to DHH students (Easterbrooks, 2008a; Easterbrooks, 2008b), which are now considered two of the CEC Knowledge and Skill Specialty Sets (Council for Exceptional Children, 2018a; Council for Exceptional Children, 2018b).

> The Council for Exceptional Children (CEC) Specialty Sets delineate the essential knowledge and skills that beginning special education professionals must possess to be ready to begin their practice in specific areas.
>
> Programs will select the Specialty Set aligned to their program or use the common specialty sets which are used to inform the CEC Preparation Standards. This means that all special education preparation programs will use either the Initial or Advanced CEC Preparation Standards as informed by the appropriate Specialty Set as they develop their curriculum and create performance assessments to demonstrate that their candidates have mastered the standards. (Council for Exceptional Children, 2020, paragraphs 1 and 2).

CEC has a flowchart that delineates the Specialty Set that should be pursued for students with mild to moderate disabilities (*Individualized General Curriculum)* versus a single disability, such as *Deaf and Hard of Hearing* (Council for Exceptional Children, 2015). A comparison of the Knowledge and Skills standards of *Initial Specialty Set: Deaf and Hard of Hearing* standards with the *Individualized General Curriculum* standard indicates a single standard for special education teachers explicitly addressing hearing,

understanding the "effect of exceptionalities on auditory and information processing skills" (IGC.1.K8; Council for Exceptional Children, 2018c, p. 1).

Since deafness primarily impacts language acquisition, a number of the *Initial Specialty Set: Deaf and Hard of Hearing* standards address this critical aspect through a deaf education lens (Council for Exceptional Children, 2018a). Practicing TODHHs must be proficient in the languages of the students (spoken and natural sign languages) (DHH.5.S7; DHH.6.S3), knowledgeable in language acquisition and how it impacts literacy learning and development of DHH children (DHH.1.K3; DHH.1.K4; DHH.1.K5; DHH.1.S5; DHH.1.S1; DHH.2.K3; DHH.2.S3; DHH.5.K1; DHH.5.S5; DHH.6.K2; DHH.6.S3), family communication (DHH.1.S4; DHH.2.K2), implementing language instruction specifically for DHH students into literacy and academic areas (DHH.5.S; DHH.5.S8); and understanding the unique needs of students' DHH status and language proficiency into account when administering assessments (DHH.4.K2; DHH.4.S3: DHH.4.S6),

There are other domains specific to deaf education within this Initial Specialty Set, including understanding incidence, prevalence, and etiologies of hearing loss (DHH.1.K1; DHH.1.K2; DHH.7.S2), managing use of hearing assistive technology (DHH.2.S2), and understanding hearing level status and implementing strategies for stimulating and conserving residual hearing (DHH.1.S2; DHH.1.S3; DHH.5.S3; DHH.5.S4). In addition, TODHHs need to be knowledgeable in areas to support DHH students and their families, including early intervention (DHH.7.K2) and deaf education resources (DHH.7.S4), laws, policies, sociocultural and political forces unique to deaf education and DHH language acquisition (DHH.6.K1; DHH.6.K3), how and when to

incorporate DHH peers and role models (DHH.2.K2; DHH.2.S1), professional DHH networks and collaborating across DHH service delivery models (DHH.7.S3; DHH.7.S5), and understanding services and organizations specific for DHH people (DHH.7.K1).

The CEC-CED working group created advanced standards for TODHHs who are working on advanced preparation in their programs in deaf education (Easterbrooks, 2008b), which is now established as the *Advanced Specialty Set: Special Education Deaf and Hard of Hearing Specialist* (Council for Exceptional Children, 2018b). These advanced standards include understanding the policy and research implications related to deaf education (SEDHS.1.K1, SEDHS.5.S1, SEDHS.5.S2), mental health services for DHH students (SEDHS.4.S3), low incidence service delivery (SEDHS.7.S1), and understanding the standards for universal newborn hearing screening (SEDHS.5.K2), interpreters (SEDHS.5.K3), and needs of DHH students with additional disabilities (SEDHS.5.K4).

The National Association of State Directors of Special Education (NASDSE) published the third edition of their document, *Optimizing Outcomes for Students who are Deaf or Hard of Hearing: Educational Service Guidelines* (NASDSE, 2018). The revisions of this document brought together a national group of experts in the field of deaf education, incorporating members from state departments of education, universities, parent groups, educational interpreting programs, accrediting agencies, and representing teachers from inclusion programs for DHH students, as well as separate schools that instruct DHH students via bilingual-bicultural American Sign Language-English, and via listening and spoken language.

The NASDSE document not only reviews TODHH preparation, but also outlines the roles and responsibilities of a multidisciplinary team approach. This team needs to provide collaborative expertise to follow DHH children from diagnosis, through early intervention, continuing to monitor accessible language and education environments, and identify appropriate postsecondary transition services. In addition, beyond personnel preparation this document identifies best practices for evaluation, goals, services, and placement of DHH students.

Another document important to providing best practices in deaf education has roots in the education of blind students. In 1997, the American Federation of the Blind, together with stakeholders of organizations that served blind and visually impaired children, developed the Expanded Core Curriculum (ECC). The ECC includes nine areas of skill development which need to be explicitly taught to blind children, which "are typically learned incidentally by sighted children through observing role models" (Lohmeier, Blankenship & Hatlan, 2009, p. 104). These skills are specific to visual impairment, and needs to be taught in addition to the traditional academic core curriculum. The MA Department of Elementary and Secondary Education (MA DESE) promotes the ECC on its website of resources for students who are blind (MA DESE, 2012).

In the decade following publication of the ECC for blind students, the Wisconsin Department of Public Instruction and the Iowa Department of Education used this document to begin discussion of the need, and as a basis of drafting, expanded core curriculum guidelines for DHH students (Iowa Department of Education, 2013). In 2007, the Iowa Department of Education formed a workgroup, consisting of representatives

from regional Area Education Agencies (providing regional and inclusion services), and the Iowa School for the Deaf, to create *The Expanded Core Curriculum for Students Who Are Deaf or Hard of Hearing,* and was updated in 2013 (Iowa Department of Education, 2013).

As with the ECC for blind students, the ECC-DHH, as it is known, focuses on explicit instruction of skills which are unique to DHH students. The ECC content areas include audiology, career education, communication, family education, functional skills for educational success, self-determination and advocacy, social-emotional skills, and technology. Acquisition of these skills is identified in four levels of competence development: early, emerging, intermediate, and advanced (Iowa Department of Education, 2013).

To determine how widely this document is currently disseminated, I reviewed all the state department of education websites in the U.S. As of December 2018, there are 12 states that include the ECC-DHH on their public department of education websites or through other state supported organizations fiscally supported by their education department (such as state schools for the deaf or regional technical centers for low incidence disabilities): FL, GA, ID, IA, KY, MI, OH, OR, TX, VA, WV, and WI. Massachusetts DESE does not yet link to the ECC-DHH. These guidelines further demonstrate the unique needs of DHH students which are not addressed in other professional preparation programs.

Other professionals cannot fill the gap

While there is some overlap with other special education teacher preparation programs, the CEC-CED standards, the NASDSE guidelines, and the ECC-DHH were all

developed with experts in the field of deaf education, which indicates best practices for supporting DHH students. In a letter to the editor of the *American Annals of the Deaf*, Marlatt (2014) addressed concerns that, due to the closure of deaf education teacher training programs and the TODHH shortage, school administrators would decide that DHH children would be increasingly served by speech-language pathologists, educational audiologists, and general special educators, which do not have the same training as TODHHs.

A review of the CEC Knowledge and Skills documents for initial and advanced special education teacher preparation outlines knowledge of general curriculum and accommodations for students with disabilities, but does not specifically address what is needed for the heterogeneous DHH population (Council for Exceptional Children, 2018c). As indicated above, the unique needs of DHH students are outlined in the CEC deaf education specialty set (Council for Exceptional Children, 2018a; Council for Exceptional Children, 2018b).

Communication disorder programs require that speech-language pathology and audiology graduates meet criteria for working with adults and children with hearing loss, outlined by the *Knowledge and Skills Required for the Practice of Audiologic/Aural Rehabilitation* document (American Speech-Language-Hearing Association, 2001), which is generally taught in a single aural rehabilitation course. There are resources which delineate the roles and responsibilities comparing TODHHs and speech-language pathologists (American Speech-Language-Hearing Association, 2004; Joint Committee of the American Speech-Language-Hearing Association and the Council on Education of the Deaf, 2004), comparing TODHHs and educational audiologists (Meyer, 2017), and

comparing all three professions (Educational Audiology Association, 2018). However, these resources address that the roles are complementary; neither a speech-language pathologist nor an educational audiologist can replace a TODHH. The TODHH shortage will impact how DHH students are educated, since teachers with other certifications and related service providers will not have the same background knowledge and training, but will still be providing service delivery when a TODHH cannot be located.

The Communication, Language, and Deaf/Hard of Hearing Division (DCD) is a special interest group of CEC and wrote a position statement, titled *Teachers of Students Who are Deaf or Hard of Hearing: A Critical Resource Needed for Legal Compliance* (Jackson, Paulson & Raschke, 2017). This document further establishes

> Although there is a high level of variation in service delivery across education settings, the specialized instruction and support from TODHHs remains the preferred model to meet the specific language, communication, academic and social needs of students who are DHH. DCD recognizes that TODHH as the expert educational team member and service provider qualified to promote and provide these services. DCD recommends that all Local Education Agencies (LEAs) ensure the services of credentialed TODHHs, in order to appropriately meet the needs of students who are DHH, as required by IDEA and ADA (Jackson, Paulson & Raschke, 2017, p.1).

Documentation of the TODHH shortage

In 2015, DESE commissioned a Massachusetts specific study to investigate teacher supply and demand over ten years (Levin, et al., 2015), and predicted a continued shortage of special education teachers. TODHHs and teachers of other low incidence populations (e.g., blind, low vision) were not mentioned in the report. The U.S. Department of Education publishes a nationwide listing of teacher shortage areas, going back to 1990. Massachusetts reported shortages of TODHHs almost every year, except for four school years: 2011-2012, 2014-2015, 2015-2016, and 2017-2018 (Department of Education, 2017). The Massachusetts Teacher of the Deaf/Hard of Hearing Shortage

Task Force was created in 2017, so when this omission was first discovered by Task Force members, there was confusion, as no one knew why a shortage was not reported to the U.S. Department of Education. Members of the Task Force who are employed by schools for DHH students noted that they have had historical teacher shortages. The Task Force investigated this omission (Meyer & Martin, 2019), which will be described shortly. But those of us working with DHH are aware of the challenge that there are not enough TODHHs to support the students who require their services.

The Conference of Educational Administrators of Schools and Programs for the Deaf (CEASD) is an organization of deaf education schools and programs throughout the United States which use sign language during classroom instruction. Over the past decade, CEASD has completed three surveys of its member schools (Tucker & Fischgrund, 2018). These surveys, conducted in 2008, 2012 and 2018, addressed the national TODHH shortage, as well as the quality and skill set of teachers needed in schools for the deaf throughout the country. The results of the most recent survey are consistent with the previous two surveys and showed there were not enough teachers in many geographical areas, including rural locations, areas with a small Deaf community, and was "especially acute" in regions where there was no nearby TODHH preparation program (Tucker & Fischgrund, 2018).

There is another organization, OPTION (not an acronym, but is always written in capital letters [B. Hecht, personal communication, May 10, 2019]) which oversees deaf education schools and programs in the United States that teach children through listening and spoken language (LSL). A similar survey of OPTION schools' TODHHs shortages was completed by Fischgrund & Tucker (2018), the same authors that completed the

CEASD survey. The results of this study found that 67% of teachers were prepared in the same state as the school they are working in; 2% of the working teachers graduated from online programs. The program directors surveyed indicated that finding teachers who have the skills to teach through LSL has been challenging, and that several schools are in states without LSL teacher preparation programs (Fischgrund & Tucker, 2018).

Both surveys addressed the number of teachers leaving and the need to replace teachers between 2018-2021. The CEASD survey determined that 392, or 19.3% of the total TODHH workforce at signing CEASD schools, would need to be filled over those three years (Tucker & Fischgrund, 2018). The OPTION survey identified that 125 new spoken language teachers would be needed to fill vacancies over the same time period (Fischgrund & Tucker, 2018). Survey results did not include TODHHs that are employed by local school districts or regional programs that are not members of CEASD or OPTION.

Dolman (2010) and Luft (2019) reported on the national crisis of teacher preparation closures, reductions in graduates of these programs, and how that will impact filling teacher vacancies. Table 1 outlines the findings of their studies over time.

Table 1. ***Decline of Deaf Education Graduates and Teacher Training Programs Since 1982***

Year	Deaf Education graduates	Deaf Education teacher training programs
1982	1,680[a]	81[a]
2009	737[b]	62[b]
2020	300 (expected)[c]	56[c]

Note. [a]Dolman, 2010. [b]Luft, 2019. [c]"Deaf Education Teacher Preparation Programs" (n.d.) (Retrieved May 10, 2020).

Purpose of the Study

TODHHs in Massachusetts are required to have master's degrees in deaf education in order to be licensed. In 2014, Massachusetts changed the requirements and created two separate TODHH licenses for teachers who intend to work with students who use sign language or spoken language only (Table 2). This license designation was for new TODHHs seeking an initial license. Teachers with older "undesignated" licenses (i.e., *Children with Special Needs: Audition, Children with Sensory Handicaps: Audition, Teacher of the Deaf,* or *Teacher of the Deaf or Hard of Hearing*) could maintain their current license, or choose to follow the requirements to meet the new licensure requirements. While there is considerable overlap between the two different licenses, the ASL/TC license has an additional requirement of passing the Sign Language Proficiency Interview (SLPI), which requires the teacher candidate to attain a high language of sign language proficiency prior to receiving licensure (MA Department of Elementary and Secondary Education, 2014).

Table 2. ***Massachusetts TODHH Licenses***

Language/Communication Mode	Applicable MA TODHH license
American Sign Language (ASL), signing exact English, total communication	ASL/TC
listening and spoken language (LSL), spoken English	Oral/Aural

However, many public schools and schools for DHH children across the Commonwealth have indicated that they have unfilled TODHH positions, or unmet consultative or direct service needs, which has been confirmed by 2019 survey completed by the Task Force on the Teacher of the Deaf/Hard of Hearing Shortage (D. Martin, personal communication, February 15, 2019). There are two other significant issues

which impact TODHHs working in Massachusetts. First, there is only one brick and mortar TODHHs graduate program in New England, located at Boston University (a private institution whose program expertise is supporting teachers who pursue ASL/TC certification). Second, there is an issue of not accepting reciprocity of teacher certification from other states, requiring incoming teachers to take the Massachusetts Tests for Educator Licensure (MTEL) teacher assessments, regardless of certification in other states or teaching experience. Massachusetts does not appear to be successfully recruiting TODHHs from other states, nor are we producing enough teachers from the in-region program to meet demand (D. Martin, personal communication, July 16, 2018). While there are a few out of state on-line TODHHs graduate degree programs, and other New England universities who offer deaf education endorsement programs for their bachelor's level teachers (e.g., New Hampshire, Connecticut), we do not have a sense of how they will impact the need, or whether they will be certified in our state. As such, the MCDHH Task Force on Teacher of the Deaf Shortage was created to understand the scope of this issue.

In order to identify the numbers of Massachusetts licensed TODHHs, I contacted Craig Weller, Supervisor of Data Analysis and Reporting at the MA Department of Elementary and Secondary Education (MA DESE). Mr. Weller indicated that there was a disparity between the total number of licensed teachers with this certification, and the number of teachers entered in the Education Personnel Information Management System (EPIMS) database. The EPIMS

> collects demographic data and work assignment information on individual *public school educators* [emphasis added]. This information enables Massachusetts to comply fully with the No Child Left Behind Act by accurately reporting on highly qualified teachers. The EPIMS data also will be used to perform greatly needed

> analysis on our educator workforce that, over time, will identify high need areas, evaluate current educational practices and programs, and assist districts with their recruiting efforts. (MA Department Elementary and Secondary Education, 2017)

An initial discussion with Mr. Weller indicated that the EPIMS database identified that 92 individuals were working overall, and, of that number, 61 were working as classroom teachers (the rest were working as administrators or other non-instructional personnel). Having insight into the numbers of certified TODHHs, I was certain that this number was too low. Further discussion with Mr. Weller indicated that EPIMS only tracks teachers working in public schools, and not in MA approved private special education schools. Mr. Weller provided the following information of licensed teachers of deaf/hard of hearing students through the 2019-2020 school year (Table 3):

Table 3. ***Current Massachusetts TODHH License Designations***

License Designation	Active DESE licenses[a]	DESE waivers[b]
Children with Special Needs: Audition	66	
Children with Sensory Handicaps: Audition	12	
Teacher of the Deaf	1	
Teacher of the Deaf and Hard of Hearing	175	
Teacher of the Deaf and Hard of Hearing [ASL/TC]	89	6
Teacher of the Deaf and Hard of Hearing [Oral/Aural]	62	1
Teachers holding both ASL/TC and Oral/Aural licenses	8	
Total active/waived licenses through the end of the 2019-2020 school year	**413**	**7**

Note. Greyed out cells above indicate older license names, which are still active.

[a]C. Weller, personal communication, March 6, 2020

[b]C. Weller, personal communication, July 16, 2020.

It is evident that the Commonwealth does not have a clear idea of where teachers of the deaf or hard of hearing are working, where they obtained their graduate degree, how they became certified, or whether they are actually working in an environment under which they are certified. Johnson (2004), in his research on teacher preparation in deaf education, stated that knowing where DHH students are being educated, pinpointing the qualification of the TODHHs and identifying

> …the particular abilities, interests, and instructional needs of those teachers and students….would help teacher preparation programs recruit the teachers that are needed rather than simply accept those individuals who indicate an interest in becoming teachers of deaf and hard of hearing students, as now generally occurs (Johnson, 2004, p. 81).

In order to recruit new teachers, or create graduate programs for such a low incidence population, it may be important to understand where teachers are currently working, find out where they trained, learn about their certification experiences and ask the basic question: why did they decide to become TODHHs in the first place?

Operationalized definitions

It is important that we have a common understanding of terminology as we go through this journey. Hearing levels are measured by an audiologist and the level is described, generally, by four "degree" categories: mild, moderate, severe, and profound. In general, those having mild, moderate, and severe ranges of hearing are described as being *audiologically hard-of-hearing*. For people who have a profound degree of hearing, they are described as *audiologically deaf* (with a lower case "d"). Each of these degrees of hearing levels has a varying impact on the listening, language and learning needs of developing children (Anderson & Matkin, 1991). Degree only refers to the hearing level itself; it does not refer to how that person communicates.

If someone refers to themselves has being *culturally Deaf* (with an upper case "D"), they identify with being part of the Deaf community using ASL and being part of a thriving social group. ASL is used by the Deaf community in the United States and in English-speaking parts of Canada. A culturally Deaf person could either be audiologically deaf, or audiologically hard-of-hearing; a specific degree of hearing is not a requirement to identify oneself as part of the Deaf community (Padden & Humphries, 2005).

Students with hearing loss are specifically defined in two areas in the Individuals with Disabilities Education Act (IDEA). *Deafness* is described as hearing levels so significant that a student would not be able to access spoken language easily even with the use of amplification devices. *Hearing Impairment* is described as hearing loss that is not covered under the description of deafness (34 C.F.R. §300.8). While these are the terms described in the statute, the current terminology used by people with hearing loss and the professionals that work with them is *d/Deaf and hard of hearing* (DHH).

There are different communication methods and approaches used with DHH students throughout the United States. In Massachusetts, the languages used by teachers working with DHH children in most schools for the deaf and in public schools, are *American Sign Language* (ASL) and/or *listening and spoken language* (LSL) (referring to using spoken and written languages, including English).

For ease of reading (and to mirror what is written in deaf education journals and in academia), the acronyms in Table 4 will be used:

Table 4. ***Acronyms Used Within This Dissertation***

Term/Phrase	Acronym
d/Deaf or hard of hearing (referring to a group of students with diagnosed hearing loss, regardless of language used)	DHH
teacher of the deaf/hard of hearing	TODHH
American Sign Language	ASL
listening and spoken language	LSL
cochlear implants	CI
Hearing Assistive Technology	HAT
Child of a Deaf Adult (refers to having Deaf parents)	CODA

The reader of this dissertation may notice the use of "identity-first," or "disability-first language" (e.g., *deaf children*) instead of "people-first language" (e.g., *children who are deaf*).

> Many guides on disability language and etiquette may likely emphasize using person-first language, except, perhaps, when discussing certain disability cultural groups that explicitly describe themselves with disability-first language. Thus, while it is generally a safe bet to use people-first language, there are members of certain disability groups in the US who prefer not to use it, such as the American Deaf community and a number of Autistic people/Autistics. The basic reason behind members of these groups' dislike for the application of people-first language to themselves is that they consider their disabilities to be inseparable parts of who they are. (Syracuse University Disability Cultural Center, 2014)

The seventh edition of the *American Psychological Association Publication Manual* has a section titled "Choosing Between Person-First and Identify-First Language" (American Psychological Association, 2020, p. 137), which refers to the use of identity specific language within scientific papers. Identity-first language is common within the DHH community and DHH academic circles and will be used throughout this dissertation.

CHAPTER 2

LITERATURE REVIEW

Deaf education and the need for TODHHs with different language expertise can appear confusing to those who do not have a background in the socio-political evolution of language instruction for DHH children, and understanding the benefits and limitations of HA and CI technologies. This literature review provides some background of how deaf education and technologies have evolved over time and what is needed to be addressed going forward.

Introduction

Across the U.S., there is a significant shortage of TODHHs who are experts in providing services in ASL and in LSL. Decisions about communication modality for DHH students are made by parents, usually long before their arrival at school. DHH children are being diagnosed earlier through universal newborn hearing screening and are using more HAT, which includes hearing aids, CIs and classroom listening technologies (previously referred to as FM systems). Many of these students communicate exclusively through LSL and, due to federal education policies, are educated in their local public schools, which must include appropriate support and related services. Not every child enrolled in public school needs access to a TODHH, however, there are many who do require a TODHH, who may or may not have one available to them.

Just owning or being fit with HAT does not automatically make LSL accessible for every DHH student. Inconsistent use, not having access to appropriate early intervention, and comorbid diagnoses can prevent age-appropriate spoken language acquisition. There are still deaf children who arrive at school without age-appropriate

receptive/expressive spoken language. ASL, as a visual language, can provide full access to these children. In some cases, parents may choose a bilingual-bimodal (i.e., ASL-English) approach to language acquisition, even if their child uses HAT or has some auditory access.

Children who acquire a solid first language, whether a spoken language or a signed language, will have the best outcomes (Hall, Levin & Anderson, 2017; Gulati, 2014; Davidson, Lillo-Martin & Chen Pichler, 2014; Boons, et al., 2012; Geers & Hayes, 2011). Different modalities (spoken and signed languages) will be addressed here, but not debated. Both have value and it is up to parents, after they receive accurate information about accessible language acquisition, to determine what is appropriate for their child and family. This section will outline historical information and current research following children from the identification of hearing loss, addressing language acquisition and entry into school and will show how the TODHH shortage is impacted for students using both languages and in every educational environment across the educational continuum.

Historical Beginnings of U.S. Deaf Education

Deafness and language acquisition have been mentioned going back to the writings of Socrates and Aristotle. Prior to the 20th century, it was common for deaf people to not have an established language, particularly if they were isolated from other deaf people. There are historical accounts of groups of DHH people growing up in a region developing local, natural sign languages, such as Martha's Vineyard Sign Language in the 17th and 18th centuries (Groce, 1985). The first systematic recorded attempt to teach deaf children occurred in the 16th century by Jerome Cardan in Italy, and Pedro Ponce de Leon in Spain using a combination of speech and fingerspelling (Nover,

2017). In 1755, the first public school for the deaf was established in Paris, where a "language of signs" was used (developed by Abbé de l'Epée) and, soon after in Germany, the oral method was used in a school established by Samuel Heinicke. For many years, Heinicke and de l'Epée engaged in bitter debate over which method was better. Around the same time, Thomas Braidwood developed his own oral methods to teach deaf children to speak and started a school in England, which his own son ran for many years (Nover, 2017; Babbidge, et al., 1965).

In 1814 Thomas Hopkins Gallaudet, a minister in Hartford, CT, was working with the deaf daughter of a neighbor, Dr. Mason Cogswell. At that time, there were 84 deaf school-aged children living in the state of Connecticut, but were no educational options for these students in the United States (Bravin, 2017). Cogswell raised money to send Gallaudet to England to learn the Braidwood (oral) method and then the plan was he would travel to Paris to study de l'Epée's (sign language) methods. It was Gallaudet's intention to combine the two methods, however, Braidwood refused to teach Gallaudet once Braidwood found out about his plans. During this same time, the successor to Abbé de l'Epée's school, Abbé Sicard, brought two of his successful deaf students (Jean Massieu and Laurent Clerc) to London for a lecture tour. After meeting these gentlemen, Gallaudet decided to abandon his idea of studying the Braidwood method and went to Paris to study with Sicard (Babbidge, 1965; Nover, 2017). After studying the French method for a few months, Gallaudet brought Clerc back with him to Hartford, where the first school for the deaf was opened in the United States in 1817, the Connecticut Asylum at Hartford for the Instruction of Deaf and Dumb Persons (now known at the American School for the Deaf) (American School for the Deaf, nd). Clerc was the first deaf teacher

of the deaf and manual communication was taught to the students (Bravin, 2017; Babbidge, et al., 1965).

Over the next 50 years, residential schools for the deaf were established in many states and some were modeled after the Hartford school, using sign language. Regional visual languages, such as Martha's Vineyard Sign Language evolved into ASL, as residential schools for the deaf were created and students moved there from isolated locations to be educated (Bravin, 2017; Groce, 1985). In 1843, Horace Mann and Samuel Howe (director of the Massachusetts School for the Blind, now known as the Perkins School for the Blind) visited schools for the deaf in Germany and came back enthusiastic for incorporating the oral method they saw into deaf education. In 1866, a donor, John Clarke, offered the state of Massachusetts money to open a residential school what is now known as Clarke School for Hearing and Speech in Northampton, MA (Babbidge, 1965). In those days, children, often as young as age five, traveled long distances from their families, living in these residential schools, in order to receive an education.

The first U.S. day school for the deaf opened in 1869, the Boston School for Deaf-Mutes (now known as the Horace Mann School for the Deaf and Hard of Hearing), which taught language using the oral method (Boston City Archives, 2017). Boston likely had a larger number of children with hearing loss within traveling distance, which allowed for the opening of a "local" school with heterogeneous groupings of students. Day schools were also opened throughout Chicago at the beginning of the 1900's (Babbidge, 1965).

An international change in the approach to teaching language, from sign language to spoken language, for DHH children occurred following the Second International

Congress on Education of the Deaf, which met in Milan, Italy in 1880. The majority of delegates were from France and Italy, and this group passed several resolutions, which read (English translation):

> (1) given the incontestable superiority of speech over signs in restoring deaf-mutes to society, and in giving them a more perfect knowledge of language that the oral method ought to be preferred to signs; and
> (2) considering that the simultaneous use of speech and signs has the disadvantage of injuring speech, lipreading, and precision of ideas, that the pure oral method ought to be preferred. (Moores, 2010, p. 309).

All Massachusetts schools taught DHH students using spoken language until 1970, when The Learning Center for Deaf Children, a day school, was established (Meehan & Ballard, 2018). Prior to 1970, Massachusetts students who used sign language travelled to Hartford, CT to attend American School for the Deaf. These earliest signing schools for the deaf used a mixture of sign language and speech, with ASL used as the language of instruction beginning in 1989 (Meehan & Ballard, 2018). Schools that incorporate ASL as the language of instruction, and teach English as a second language, are known as bilingual-bicultural schools. The first schools for the deaf to use a bilingual ASL-English approach around 1989 were California School for the Deaf, Indiana School for the Deaf, and The Learning Center for Deaf Children (now known as the Marie Philip School at The Learning Center for the Deaf) in Framingham, Massachusetts (Meehan & Ballard, 2018).

The development of technology and research in language learning has continued to impact the educational programming for children of various hearing levels over the last few decades. Today, Massachusetts families have access to both ASL and spoken language educational opportunities for their DHH children.

Early Identification Through Universal Newborn Hearing Screening

Hearing loss is considered "low-incidence." For babies born in a well-baby nursery, hearing loss occurs in 1 to 3 newborns per 1000 births. In the neonatal intensive care unit (where sick infants are cared for), the prevalence of hearing loss is 2 to 4 per 100 births (American Academy of Pediatrics, 1995). This does not take into account children who lose their hearing after they passed their newborn hearing screening. Only 1.1% of children in special education have hearing loss as a primary disability (U.S. Department of Education, 2017); this number does not include students with hearing loss not enrolled in special education, but are enrolled in schools and receive accommodations on 504 plans.

The Joint Committee on Infant Hearing (JCIH) is comprised of representatives encompassing medical, audiological and deaf education groups which have a professional interest in identification and intervention of hearing loss in children. In 1994, due to the member organizations' concerns that DHH children were not accessing language while hearing levels went undetected, the JCIH recommended that states implement universal newborn hearing screening (UNHS), which indicates that all babies are screened, regardless if they have syndromes or medical issues that knowingly caused hearing loss. This screening and follow up was recommended to follow the 1-3-6 Principle, as stated in the Healthy People 2010 initiative:

> newborns must be screened by one month. If the child does not pass a screening, then a comprehensive evaluation of hearing must be completed by three months. If the child is found to have reduced hearing, then intervention should be started by age six months (U.S. Department of Health and Human Services, 2010).

The most recent JCIH position statement recommends when states have already met the 1-3-6 Principle, to consider setting a new target of 1-2-3 months (screening

completed by one month of age, audiologic diagnosis completed by two months of age, and early intervention initiated no later than three months of age) (Joint Committee on Infant Hearing, 2019, p. 4).

Intervention connects families with the state's Early Intervention providers and could mean working on spoken language development, using hearing aids and/or starting language intervention with ASL, as determined by parent choice. The intervention timeline was based on Yoshinaga-Itano and colleagues' research, which showed that infants whose hearing loss was identified and intervention begun by age six months had better language and developmental outcomes than intervention begun after six months of age (Yoshinaga-Itano, et al., 1998).

Prior to the implementation of UNHS, the average age of identification for profoundly deaf children in the US was two-and-a-half years (Commission on Education of the Deaf, 1988) and less severe hearing levels often was generally diagnosed by five years old (Russell, et al., 2013). In those days, many states followed a high risk registry protocol, providing newborn hearing screening only if the baby was at risk for developing hearing loss. Infants were identified as high risk if they were placed in the special care or intensive care sections of the newborn nursery or presented any of the indicators that were known to interfere with typical hearing development, listed by the Joint Committee on Infant Hearing Screening (e.g., in utero infections, such as toxoplasmosis, craniofacial anomalies, or evident syndromes) (Meyer & Wolfe, 1975). However, retrospective studies found that using a high risk registry missed approximately half of the children born with hearing loss (Pappas, 1983).

The U.S. Maternal and Child Health Bureau provided the first federal grants to encourage statewide newborn hearing screening programs (Johnson, et al., 2011), which means that every baby born in a hospital would have their hearing screened. These first Universal Newborn Hearing Screening (UNHS) programs were established in Rhode Island, 1989; Hawaii, in 1990; and Colorado, in 1993 (Morton & Nance, 2006). In 1998, Massachusetts passed its own UNHS law (Commonwealth of Massachusetts, 1998; Liu, et al., 2008). Dr. Martha Morris, epidemiologist at the MA Department of Public Health, revealed that since 2003, the Massachusetts UNHS Program has identified nearly 3,000 cases of permanent infant hearing loss, at an average rate of 212 cases per year, or 2.8 cases per 1,000 live births (M. Morris, personal communication, May 29, 2018). UNHS programs have been created in all 50 states, and data are collected on screening and pass rate of all children. This information is publicly available and maintained by the National Center for Hearing Assessment and Management at Utah State University (National Center for Hearing Assessment and Management [NCHAM], 2018).

Technology and Its Impact on Deaf Education

With the adoption of UNHS, DHH children are using HAT in the form of digital hearing aids or CIs at earlier ages. These devices provide greater access to sound; however, often general educators believe that this technology allows DHH children to hear perfectly, in the same way that glasses correct vision. Hearing loss creates distortion in the ear, which cannot be remediated with HAT devices; DHH children who use HAT will always be listening through a distorted auditory system. Unlike a glasses analogy, hearing technologies do not correct hearing, nor do children with HAT function auditorily similar as children without hearing loss. When students are participating in

regular education settings, using LSL, the majority of them will use a HAT device in order to auditorily access the curriculum. There is increasing evidence that many DHH students use hearing aids or CIs at schools for the deaf, even when ASL is the language of instruction (Gallaudet Research Institute, 2011).

The CI assessment process has several requirements which determines whether a child is eligible to be a candidate and receive the surgical procedure. These requirements include that the child has hearing loss in the profound range, minimal benefit from traditional hearing aids, and imaging that shows a present cochlea and cochlear nerve. The Food and Drug Administration (FDA) first approved CIs for use in adults in 1984. The agency approved them for use in children as young as age two in 1990, and in children as young as 12 months in 2002 (Sampaio, et al., 2011). In 2020 the FDA approved CIs for children as young as 9 months of age (Food and Drug Administration, March 17, 2020).

While CIs provides greater access to sound than hearing aids, there is no guarantee of a particular result. The speech perception and deaf education research literature discusses gaps when comparing children with CIs to hearing peers, and the variability of CI outcomes (see also Russell et al., 2013; Boons, et al., 2012; Geers & Hayes, 2011; Niparko, et al., 2010; Marschark, et al., 2007). For example, there are many children with CIs who are able to understand spoken language without looking at their communication partner's face (e.g., speechreading), and their spoken language scores are on par with hearing children. Other children, who may have been implanted at the same time, with the same device, may not be able to use their hearing for anything other than auditory awareness (i.e., just knowing that sound is happening, but not being able to

understand speech), which is not sufficient for learning spoken language. Longitudinal studies will continue to help us understand about outcomes in pediatric cochlear implantation as technology continues to improve (Russell, et al., 2013) however language acquisition and monitoring are the responsibility of the child's clinical and education teams in schools, which should include TODHHs as a team member. Unlike the "glasses analogy," these teachers also understand that hearing aids do not correct hearing. This perspective is absent from special education teacher preparation, yet central to TODHH training, and critical to the learning needs of children who use these technologies.

Language Acquisition

Hearing aids and later, CIs, as indicated in the previous section, allow many DHH children the auditory access in order to acquire spoken language. However, it is important to emphasize these technologies do not produce magical outcomes. To learn how to use sound input, in order to acquire spoken language, a child needs aural rehabilitation, a term for systematic auditory training (American Speech-Language-Hearing Association, 2001). Cochlear implants are sound implants: they are neither "language implants" nor "learning implants." While many children use this sound to develop spoken language and to acquire learning through listening, these are not guaranteed outcomes for all children. The research is clear that outcomes are variable across all CI users (Russell, Pine & Young, 2013; Boons, et al., 2012; Geers & Hayes, 2011; Niparko, et al., 2010; Duchesne, Sutton & Bergeron, 2009; Marshark, Rhoten & Fabich, 2007).

There is an abundance of LSL research to show that for children who consistently use their technology and are instructed using structured responsive language modeling techniques (Eng, n.d.) and conversational exchanges (VanDam, Ambrose & Moeller,

2012; Romeo, et al., 2018) their spoken language acquisition trajectories can mirror hearing children (Svirsky, et al., 2004), but will be delayed (occurring in a typical language acquisition trajectory, but later than age appropriate norms), rather than disordered. If the goal, however, is a fluent first spoken language, then the assumption cannot simply be to put a child with hearing technology in proximity of hearing people and expect that the language acquisition process will occur without intervention. ASL acquisition mirrors typical spoken language trajectory acquisition, if language instruction is implemented with fidelity and by fluent users of the language, not just a teacher who "knows some sign language" or simply labels items in the environment (Mayberry & Squires, 2006).

There is increasing research on the phenomenon of Language Deprivation Syndrome, which is the concept of a DHH child never developing an established first language. Mayberry & Lock's (2003) neurolinguistics research

> …indicate that the onset of language acquisition in early human development dramatically alters the capacity to learn language throughout life, independent of the sensory-motor form of the early experience. (p. 369)

The recent psychology and psychiatry literature addresses serious mental health concerns of deaf teens and adults who did not acquire an established primary language (either spoken or visual language) (Pollard & Fox, 2019; Szarkowski, 2019; Hall, Levin & Anderson, 2017; Glickman, 2016; Gulati, 2014).

Language acquisition is the most basic need for DHH students. Whether the family has selected ASL or LSL as their child's primary language, the TODHH is trained to provide the expertise in how to implement accessible language acquisition instruction and accessible education to a DHH student. A collaborative professional framework of a TODHH, special educator, speech-language pathologist (SLP), educational audiologist

(EdAud), and deaf parents mentors for can occur as soon as early intervention service delivery. An SLP is generally responsible for language intervention in public schools and is trained to work with a variety of students with language disorders. If appropriate language acquisition interventions are put into place, the DHH child's language may only be delayed. However, if systematic language intervention is not implemented according to evidence-based practices, the resultant language delay can result in language deprivation and disordered language (Szarkowski, 2019). The team approach is needed to determine how to consistently monitor the language acquisition of DHH students.

DHH children need fluent language models, systematic language learning instruction and parent coaching to be able to acquire a solid first language, regardless if the family has selected LSL and/or ASL as their child's primary language. Qualified and certified TODHHs, who are knowledgeable in supporting language learning, need to be a member of interdisciplinary early intervention and educational teams to monitor appropriate language trajectories for DHH children.

Current State of Education of DHH Students in Massachusetts

Since the creation of UNHS in Massachusetts, an average of 220 children under six months of age are annually diagnosed with hearing loss (M. Morris, personal communication, May 29, 2018). From this very early age, TODHHs who specialize in early childhood are needed to collaborate with speech-language pathologists to work on language acquisition of these children (regardless if the families choose to use sign language, spoken language, or both, to communicate). Once these children reach school-age, there is a need to implement the curriculum in an accessible way.

Each year, the federal government collects data from states on all students with IEPs, which can be viewed by disability category. Through this information, we know that the majority of DHH students are educated in public schools. The most recent national data for school-aged students (ages 6-21) was published for the 2016-2017 school year, which shows that students with hearing loss comprise 1.1% of all students with disabilities on IEPs. In Massachusetts, the incidence of hearing loss for school-aged students on IEPs is .8%. These national data show that 88% of students with hearing loss are being educated in regular schools, and of those, 61% are educated in regular education classrooms for more than 80% of the school day. (U.S. Department of Education, 2017). The Massachusetts data indicated in the 2016-2017 school year, of the total 1,057 DHH students on an IEP over age six, 66.8% were educated in regular schools (U.S. Department of Education, 2017). The data also show that 53% of Massachusetts early childhood students (ages three to five) with hearing loss are educated in inclusive settings (U.S. Department of Education, 2017). The students who are educated in specialized programs in our state may be attending regional approved private special education schools (such as Beverly School for the Deaf, Clarke School for Hearing and Speech, Marie Philip School at The Learning Center for the Deaf, or Willie Ross School for the Deaf), a public day school (Horace Mann School for the Deaf and Hard of Hearing), or collaborative deaf education programs (known by their acronyms EDCO, CAPS, SEEM and READS) (MA DESE, 2015). Regardless whether a student participates in an inclusive setting or in a special placement for DHH students, the teacher needs be knowledgeable about what a child with hearing loss needs in order to learn.

TODHHs – Highly Specialized Training To Meet Students' Needs

> As the field of special education has evolved to a more inclusive approach to meeting the needs of students, TODHHs often find themselves in the position of explaining why their specific qualifications are critical to achieving positive outcomes for students who are DHH (Jackson, et al., 2017, p. 3).

Having a strong understanding of the impact of hearing levels and technology is only the beginning of the education of the DHH student. The National Association of State Directors of Special Education (NASDSE) have convened work-groups over the past 25 years to publish three editions of the *Students Who are Deaf or Hard of Hearing Educational Service Guidelines* in 1994, 2006, and 2018 (C. DeConde-Johnson, personal communication, October 6, 2018; NASDSE, 2018). This document is comprehensive in that it outlines the multidisciplinary team approach needed for successful instruction of diverse DHH students.

As outlined in Chapter 1, the Council for Exceptional Children (CEC) and the Council on Education of the Deaf (CED) have determined the knowledge and skills standards for TODHHs to effectively teach DHH students. The CEC-CED standards are used by deaf education teacher preparation programs to develop curriculum, in conjunction with state requirements for initial preparation (Easterbrooks, 2008a) and advanced preparation (Easterbrooks, 2008b) for TODHHs. In response to schools not consistently using TODHHs for the instruction of DHH children, the CEC Division of Communicative Disorders and Deafness recently published a position statement *Teachers of students who are deaf or hard of hearing: A critical resource needed for legal compliance* (Jackson, et al., 2017). This document states that the TODHHs are "prepared to meet the unique needs of, and provide specialized instruction" (p. 3), which addresses

the areas in the CEC-CED standards and is also outlined in the NASDSE Guidelines (NASDSE, 2018).

Due to the low incidence nature of hearing loss, and the lack of experience school districts have in servicing this population, the Office of Special Education and Rehabilitative Services (OSERS) wrote the *Deaf Student Educational Service Policy Guidance* (1992), which was implement by the Office for Civil Rights. This policy guidance requires that the IEP team:

> (iv) Consider the communication needs of the child, and in the case of the child who is deaf or hard of hearing, consider the child's language and communication needs, opportunities for direct communications with peers and professional personnel in the child's language and communication mode, academic level, and full range of needs, including opportunities for direct instruction in the child's language and communication mode; and
> (v) Consider whether the child requires assistive technology devices and services. (20 U.S.C. § 614(d)(3)(B))

However, implementation of the *Deaf Student Educational Service Policy Guidance* (now included within IDEA as the *Consideration of Special Factors* (2004)) in IEPs throughout the United States is variable and is not included in Massachusetts IEPs (Luft & Amiruzzaman, 2018). As such, there are anecdotes of cognitively-typical DHH children who do not develop appropriate language acquisition trajectories, or worse, do not acquire a solid first language, because the school team does not have, or consult with, an expert in DHH students.

Other professional graduate training programs, such as special education or speech-language pathology, might have a single class or a course on deafness, which is not adequate to meet the language and learning needs of all DHH children. However, Martlett (2014) indicates these professions are increasingly taking over the responsibilities of TODHHs. A recent phone call with a Massachusetts special education

administrator confirmed this. This rural administrator admitted that even when the IEP team felt that a TODHH would be the most appropriate educator, the team instead recommended a special education teacher, because they knew they would have difficulty finding a TODHH to provide the service, and did not want to be out of compliance with the IEP (Anonymous, personal communication, October 5, 2018). DHH children need a team working with them, which may include speech-language pathologists and special educators, but the unique skills and training of TODHHs should not be erased in the process.

A literature search was initiated to find a list which compares TODHH licensure requirements across states. When that search did not yield the information needed, inquiries were made to CEC and CEASD, as well as through personal contacts in deaf education. These contacts all reported that this information is not compiled.

TODHH Training in Massachusetts

References to the shortage of TODHHs have been made throughout the decades for children who predominantly learn through ASL (Tucker & Fischgrund, 2018) and for those who learn through LSL (Lenihan, 2010; Marvelli, 2010). A number of reports have addressed the serious issue of closures of deaf education teacher preparation programs over the last thirty years (Commission on Education of the Deaf, 1988; Johnson, 2004; Dolman, 2010; Luft, 2019) at “an alarming rate” (Marlatt, 2014, p. 484).

Prior to 2015, Massachusetts had two deaf education teacher preparation programs, which were the only training programs in New England. The teacher preparation program between Clarke School for the Deaf and Smith College in Northampton, MA was formally established in 1926, although Clarke School had been

providing “on the job,” in-service, and summer teacher training opportunities since the 1800’s (Marvelli, 1973). Clarke School for the Deaf is one of the oldest continuing “oral” (now known as listening and spoken language) schools for DHH children, and the teacher preparation program reflected that communication approach. Dr. Alan Marvelli, the long-standing director of the Clarke-Smith partnership, documented the history of the teacher preparation program in his doctoral dissertation from the University of Massachusetts-Amherst (Marvelli, 1973). In 2015, five years after Marvelli’s retirement, Smith College decided to shutter the teacher training program (Kolchin-Miller, June 25, 2015).

The teacher preparation program at Boston University was established in 1961 as an “oral” program using spoken English. The focus was changed to a sign language teacher training program, when Dr. Robert Hoffmeister, a CODA, was hired to direct the department in 1979 (Katz, 2000). The *BU DeafEd* program (as it is colloquially known), continues today as a robust Bilingual-Bicultural American Sign Language-English program, and is currently the only brick and mortar deaf education training program in New England.

Table 5 shows that, despite the US numbers of DHH students receiving special education services increased from 1990-2015, the numbers of TODHHs declined, and those graduating from these two programs remained constant (although it is unknown how many of these newly minted teachers remained in Massachusetts or in New England). Since 2014, through the 2018 (the most recent year data are available), the number of DHH students in Massachusetts increased each year, for both early childhood (ages 3-5) and school aged groups (ages 6-22). 2015 was the last year the Clarke-Smith deaf education program graduated teachers, Currently, those who want to attend a local

brick and mortar institution for a deaf education graduate degree in New England, have the Boston University program as their only option.

Table 5. ***Total DHH Students enrolled in Special Education in the U.S. and Massachusetts, Compared with TODHH Graduates from the Same Years (where data are available)***

Year	DHH students (U.S. DOE)	TODHHs graduated (nationally)	Massachusetts DHH students		TODHHs graduated (Massachusetts)
			ages 3-5	ages 6-21	
1990-1991	59,211[1a]	791[b]	Not	available	25[b] (BU=10; Smith=15)
2014-2015	67,884[d]	598[c]	175[d]	1,044[d]	28[c] (BU=11; Smith=17)
2016-2017	65,465[e]	Not available	185[e]	1,057[e]	8 (BU graduates)[g]
2017-2018	64,812[h]	Not available	200[h]	1,098[h]	10 (BU graduates)[g]

Note. [a]U.S. Department of Education (1991). [b]Programs for Training Teachers (1991). [c]Programs for Training Teachers (2015). [d]U.S. Department of Education (2015). [e]U.S. Department of Education (2017). [f]Data for TODHH graduates have been collected triennially, however only 12 teacher preparation programs reported data for 2017, so the total number was not included (D. Mullervy, personal communication, August 6, 2018). [g]A. Lieberman, personal communication, March 29, 2019. [h]U.S. Department of Education (2018).

Special Education and TODHH Shortage Research

There has been a long-term, significant special education teacher shortage throughout the United States (U.S. Department of Education, 2017). To address the overall special education teacher shortage throughout the United States, there are scores of journal articles and doctoral dissertations which focus on adequate preparation for new

educators, alternative pathways to teacher certification (and whether they are a good idea), mentoring, job satisfaction/efficacy, burn-out/attrition, in an attempt to retain special education teachers in the classroom. Within this research, there have been attempts to address the shortage by investigating the attrition, "burn-out," and satisfaction rates of new and experienced teachers and identifying the needs of teachers who have been termed "leavers" (those who exit public school teaching) versus "movers" (those who change positions) (Edgar & Pair, 2005; Billingsley, 2004). Quite a few studies have attempted to pin down the myriad of factors responsible for teachers not moving from their positions, schools, districts or leaving the profession altogether. The Learning Policy Institute, a think tank, has synthesized this research and published research and policy briefs to help states address the teacher shortage, including "Taking the Long View: State Efforts to Solve Teacher Shortages by Strengthening the Profession" (Espinoza, Saunders, Kini & Darling-Hammond, 2018). Despite decades of this published research, we still have a national shortage of special education teachers.

Prior to the late-20th century, DHH students were educated in a centralized school for the deaf model of instruction (Padden & Humphries, 2005). Following the passage of IDEA, and the implementation of the Least Restrictive Environment (LRE) requirement, decisions about educational placement are made according to the *Continuum of Alternative Placements* (2004). As a result, DHH children are found in dispersed educational environments, often as the only deaf child within a single school (Cawthon, 2006; Oliva, 2004). Instruction from a TODHH is still needed for many of these students, and the placement changes have only made service delivery more challenging.

TODHH shortage is at critical levels as documented by the Council of Educational Administrators of Schools and Programs for the Deaf (CEASD), an accreditation organization of schools for the deaf (Tucker & Fischgrund, 2018; Fischgrund & Tucker, 2018), the Council of Education of the Deaf, which accredits TODHH training programs (Luft, 2019), as well as federal government tracking of teacher shortages by state. In the most recent federal document from 2004 through 2018 there were only three school years (2011-2012; 2014-2016; 2017-2018) where the state of Massachusetts did not report a TODHH shortage (U.S. Department of Education, 2018). It is unknown why those recent years did not report a shortage, since the Task Force on the Teacher of the Deaf/Hard of Hearing Shortage, established by the Massachusetts Commission for the Deaf and Hard of Hearing (MCDHH) Steering Committee, was established in 2017, as indicated in Chapter 1. This Task Force was established by MCDHH and DESE to address the TODHH shortage that is being reported to them by schools for the deaf and public school districts. A survey sent out by this committee to school districts and schools/programs for deaf students, found that for the 2016-2017 and 2017-2018 school years, 40 districts/programs (32.5% of respondents) reported difficulty implementing TODHH services of at least three months. Twelve respondents indicated that they were unable to find a TODHH at all (Meyer & Martin, 2019).

TODHH Workforce Research

In order to address teacher shortages, it is important to understand the Massachusetts TODHH workforce to identify the current state of the profession and challenges these teachers face. The body of research of working TODHHs in the United States is limited, and none of the published research addresses these low incidence

teachers working in Massachusetts. In addition, no published research comprehensively looks at TODHHs in multiple working environments or varied communication methods in a single state. The articles which addressed the TODHH workforce research included qualitative, quantitative and mixed methods research.

Workforce Research: Beginning TODHHs

Few research studies have focused on the needs of TODHHs at the very beginning of their careers. Two studies, Guteng (2005) and Peneston (2012), assessed how TODHHs in their first years of teaching felt they were able to meet the needs of their DHH students. Guteng (2005) completed a qualitative phenomenological study which attempted to describe the lived experience and concerns of new TODHHs. Five first year TODHHs who taught in southwestern states were recruited. Two participants were itinerant teachers (teachers that travelled between school districts) and three taught in self-contained classrooms. The itinerant teachers taught in both rural and urban environments (since their work required them to move between different schools). The three self-contained classes were also located in both rural and urban environments. While there was mention of self-contained teachers using sign language, the language use of each teacher with their DHH students was not explicitly described. In addition, the number of students that the TODHHs were responsible for was not included. The TODHHs were interviewed in three phases over several weeks. Research questions were added and modified after each interview. These semi-structured interviews addressed why they became a TODHH, their professional experiences and to reflect on professional concerns and what could be done to address these concerns. To further validate the information shared, Gutang shadowed the teachers for two full days and took field notes.

He used a within-case analysis, treating each participant as a case, to determine within-case themes and patterns. Once the within-case analysis was complete, he used cross-case analysis to identify common patterns and categories across cases. Results indicated there were common challenges for the majority (described as at least three out of five) of these new teachers, although there were examples specific to itinerant and self-contained teachers. These common challenges included administrative issues (e.g., finding locations to teach students [itinerants], lack of planning time with general educators, and lack of mentor support); concerns about working with general education teachers (e.g., itinerants identified concern about their unwillingness to allow modification of the students' curriculum; self-contained teachers identified the lack of mutual support and interest in sign language and Deaf culture); student behavior problems; school and district policies (e.g., filing paperwork, copying, funding and borrowing materials); and working with parents (e.g., educating them about realistic expectations, and frustrated with the parents' lack of communication with their DHH children). The suggestions to improve these issues were, in some cases, specific to the itinerant versus self-contained service delivery, but included collaborating with administration to address the mentoring and training needs where the students were located.

The qualitative information collected by Guteng (2005), read with Peneston's (2012) quantitative survey dissertation, provides a broad perspective of early teacher experiences. Peneston (2012) focused on TODHHs who worked less than five years, examining these beginning teachers' experiences in their deaf education teacher preparation programs, their perceptions of preparedness to teach DHH students, and supports provided by their district and school. Sixty-two teachers in an 11-state area in

the northern midwest and southwest areas of the United States, who taught DHH students for less than five years and were certified as a TODHHs in the state they were employed, participated. These teachers completed a researcher-created online survey of 123 items in the areas of teacher background, teacher perceptions in preparedness to teach, deaf education teacher preparation program instruction, and perceptions of the supports provided by their district and school. Using bivariate correlational analysis and multiple linear regression analyses, results of their own preparedness to teach indicated that overall they felt least prepared using a variety of communication modes (with Cued Speech being the least area of preparedness for this variable), working with students with multiple disabilities, supervising and scheduling interpreters and aides, teaching at a school for the deaf, and course content in deaf education settings. Addressing support provided by the school and district, teacher responses only slightly agreed that their district and school provided adequate resources or adequate professional development related to behavior and classroom management. Responses also indicated teachers were asking for more opportunities to participate in team teaching, did not feel that they had enough opportunities to observe other classrooms, and identified that time at the beginning of the school year and professional development with an in-service focus related to deaf education issues were inadequate. This study provided insight as to suggestions for deaf education teacher training programs to support the working teacher's perception of lack of instruction, as well as what schools can do to provide additional support for their beginning teachers so that retention can occur.

Workforce Research: National and Regional Surveys on TODHH Job Satisfaction

A few studies attempt to survey a national or regional group of TODHHs on issues such as job satisfaction or efficacy. Meadow (1981) attempted one of the earliest qualitative surveys on this topic, focusing on the level of job satisfaction and career motivation on professionals who worked in deaf education settings (which included TODHHs), compared to teachers of students without disabilities. Participants were recruited from attendees of the annual Eastern Regional Conference for Educators for the Deaf in PA, and from those who worked at Kendall Demonstration Elementary School in Washington DC. One hundred three (43%) of the 240 participants were classroom teachers (the other half were other employees of deaf education settings, including administrators, audiologists, counselors, and teacher aides), and 17% of the respondents had hearing loss themselves. The respondents completed the Maslach Burnout Inventory (MBI), a demographic sheet, and a supplemental sheet related to career motivation and job satisfaction (specific to deaf education settings). At that time, the MBI was a 25-item survey using a Likert-type scale, which measured four dimensions of burnout for a variety of occupations: emotional exhaustion, depersonalization, personal accomplishment, and personal involvement (current versions of the MBI have 22 items). Meadow compared the 103 participants who were TODHHs with "teachers of non-handicapped students" (unpublished data from the test administrators, referred here as general education teachers). A t-test identified that TODHHs scored significantly higher emotional exhaustion than general education teachers, but were not significant for the other dimensions. Analysis of variance testing compared dimensions of burnout by school role and by work environment. Scores reached significance for TODHHs related

to emotional exhaustion in connection with their job and for those who work in residential schools related to “depersonalizing” their students (this dimension of testing was not defined within the journal article, and was used in quotes in the discussion of the results). Meadow discussed that the key to prevention of stress is to build support systems for TODHHs and for all those who work with DHH children. However, Meadow’s study focused on a broad group of professionals who work with DHH children, not just TODHHs.

Luckner and Hanks (2003) conducted a mixed method study of job satisfaction perceptions of a national sample of TODHHs, and recently completed a replication study with the same instrument (Luckner & Dorn, 2017). Both studies used the Job Satisfaction of Teachers of Students who are Deaf or Hard of Hearing survey and responses were collected online. The Luckner and Hanks (2003) study was completed by 610 TODHHs and over 74% of these respondents had a master's degree or higher. Teachers working in general education schools comprised 55% of the responses, and itinerant TODHHs were the largest group responding at 35% of the total. The Luckner and Dorn (2017) survey was completed by 495 TODHHs with some reported demographics similar to the 2003 results: 75% had a master's degree or higher, 50% worked in general education schools, and itinerant teachers were still the largest responding group at 41% of the total. Language and communication methodology demographics were described in this second study, with spoken language being the most used at 66%, total communication at 48%, ASL at 31%, and 1% used cued speech. The location of respondents was not described in either study. Survey construction information was included in the first study (Luckner & Hanks, 2003) and how the survey

was modified in the second (Luckner & Dorn, 2017). The original survey had 59 items, a demographic section, and open-ended questions asking about job satisfaction. The survey was updated for the latest study with minor wording changes, adding two items to the demographic section and adding some job-related items to reflect current trends, resulting in a 65-item questionnaire. The actual survey was not included in either paper. In both studies (Luckner & Hanks, 2003; Luckner & Dorn, 2017), the quantitative and qualitative results were analyzed separately, and then the qualitative responses were compared to the quantitative responses. In both studies, the majority of TODHHs indicated they were satisfied in the "job as a whole." Negative trends were evaluated by looking at the ten items that participants most often identified as "dissatisfied" or "very dissatisfied" in both studies. In the 2017 replication study, these 10 items contained seven of the negatively identified items listed in the 2003 study. In the 2017 replication study, an ANOVA compared ratings for job overall across work settings; analyses were not statistically significant across settings, which was similar to the 2003 study. Analysis across language/communication methods used was not included. The description of qualitative analysis process was not included in the 2003 study, but was explicit in the 2017 paper; the researchers used the constant comparison method of data analysis to create categories. Qualitative responses were similar across the two studies. For the open ended question asking about enjoyable aspects of their job, the dominant theme was the gratification that TODHHs have from working with students. Related to challenging aspects of the job, open ended responses were more diverse, and mirrored the causes of dissatisfaction in the quantitative data (e.g., state assessment tests for DHH students, providing DHH students with DHH role models, and professional development related to deaf education). Both the

2003 and the 2017 studies overwhelmingly identified that TODHHs were positive about their jobs. The authors addressed each item in the negative trend, with some suggestions to rectify these problematic situations.

Garberoglio, Gobble, and Cawthon (2012) also attempted to survey a national sample of deaf educators, with a quantitative online survey that evaluated TODHH's efficacy, or "belief that teachers have on their capacity to make an impact on student's performance" (p. 367), different than the perspective of job satisfaction. Participants included 296 teachers from 80 different deaf education settings across the U.S., who worked with at least one deaf student. Eighty-five percent of the respondents used ASL or a mixture of ASL or sign language combined with other communication methods, and less than 14% used oral only methods. This suggests that itinerant teachers of DHH students who participate fully in general education settings were under-represented, which is consistent with Cawthon's (2006) work that DHH students in inclusion settings (and their teachers) are difficult to locate for survey research. TODHHs completed this survey, which contained three parts: demographic data, the Teacher Sense of Efficacy Scale (TSES) and the short version of the Collective Efficacy Scale (CE-Scale), which asked participants to select Likert-type scale responses. The 24 item TSES measures three subscales; efficacy in student engagement, efficacy in instructional strategies, and efficacy in classroom management. The 12 item CE-Scale measures collective efficacy beliefs held by teachers at their educational setting. Correlational coefficients were computed between the overall TSES scores, subscale scores, and school-level variables of interest. Multiple regression analysis was completed to investigate whether perceived collective efficacy in the school setting predicted teachers' sense of efficacy beyond

participant demographic characteristics. These results indicated that the teachers' perceived collective efficacy of the school setting had the only significant relation with teachers' overall sense of efficacy. Collective efficacy beliefs of deaf education school settings support that administrator training and professional development overall are needed for TODHHs to be able to do what is needed to support their students and continue to feel positively about their work.

Workforce Research: Itinerant TODHHs.

There has been increased need to understanding the needs of itinerant teachers' practice and preparation, since more DHH students are included in their neighborhood schools. Research in this area is emerging and includes quantitative, qualitative and mixed method studies.

Luckner and Miller (1994) completed one of the earliest survey studies on itinerant TODHHs. Three hundred nineteen researcher-created paper questionnaires were received from itinerant TODHHs from 48 U.S. states, which represented suburban (46%), urban (28%), and rural (26%) settings. The survey consisted of demographic information, and asked them to identify characteristics of itinerant teaching and provide information about a sample student. Responses on how they spent their week varied considerably including obtaining and adapting materials, providing direct service to students, consulting to general education teachers, and considerable amounts of driving. Itinerant TODHHs who responded to this survey indicated that their caseload was determined primarily by geographic region and they averaged driving 178 miles between schools per week. They also reported to work with a variety of students, who vary in age, school setting, level of functioning, and who have additional disabilities. While the

majority of TODHHs felt that itinerant services were effective for their students, 14% of the respondents reported an itinerant model was not appropriate for a student on their caseload. This study provided a basic understanding of what itinerant teachers do in their daily work.

Luckner and Howell (2002) found that itinerants were learning most of their skills on the job, and, through qualitative interviews, attempted to collect information to identify the itinerant content and experiences that should be included in TODHH preparation programs. Twenty-five working TODHHs in one western state participated in a three phase interview process. In addition, teachers were asked to provide demographics of one anonymous sample student who was representative of students on their caseload. There were eight pre-determined interview questions, which were then followed up with addition clarification questions. Responses were transcribed and during a constant comparison process themes were developed and similarities and differences were identified. All respondents reported that the single most important aspect of their job was consulting with parents and general education teachers. TODHHs were evenly divided identifying the part of their job that had the greatest impact on students, between teacher/parent consultation and providing direct instruction to students. These participants provided suggestions of what TODHH preparation programs should offer, including: training about DHH students with multiple disabilities, troubleshooting experience with HAT, organizational skills related to scheduling and time management, and student teaching experience as an itinerant.

Foster and Cue (2009) conducted a mixed method study to identify the roles and responsibilities of itinerant teachers, updating the work done by Luckner and Miller

(1994). Surveys were completed by 210 itinerant TODHHs from 20 states. To gather qualitative data, a focus group of eight itinerant teachers was conducted and two teachers were observed at their schools, and then interviewed. On the survey, teachers were asked to list up to ten of the "most important tasks" that they do as an itinerant, where they learned that skill, and asked whether that skills should be included in a TODHH preparation program, or be a professional development topic. The researchers analyzed 1,304 tasks suggested by the itinerant teachers, and coded them into seven categories: working with students (with five sub-codes, which addressed student academic and social emotional needs); working with regular class teachers; planning, assessment, and record keeping; coordination, meetings and scheduling; working with parents; providing technical support; and identifying skills and qualities needed in an itinerant. Only 17% of respondents said they learned the skills they do every day through their teacher preparation program, compared with 65% who learned on the job. The survey results were consistent with the interview transcriptions and field notes.

Klewin, Morris, and Clifford (2004) completed a rapid ethnography study, completing in-depth interviews about itinerant TODHHs and the work they do. Ten teachers, from suburban school districts in two eastern states, and an additional 22 general educators who were familiar with the itinerants' work, were selected for interviewing. Observations of the itinerants' work day, interviews with the general education teacher about their perceptions of the itinerant teacher's work, and two semi-structured interviews with each of the itinerant TODHHs were conducted, as well as analyzing archival data (e.g., copies of schedules, school district policy documents, etc.). Researchers used the constant comparative method of analysis and triangulation (cross-

checking information with the itinerant, with others who work with the itinerant, and with other sources). Based on these analyses, a number of themes emerged which identified the positives and challenges/barriers to itinerant teaching, which included the variation of school settings, demands on the itinerant's time, having resources across school sites, maintaining human contact, and supporting the goals of the deaf education program. The conclusion by these researchers is that itinerant TODHHs are successful when they can seamlessly weave all the parts of their job together in order to be connected to their school and students.

Recent research on itinerant teachers continued to document how these TODHHs use their time and provide services. Luckner and Ayantoye (2013) conducted a study to update their knowledge of the practices and preparation of itinerant teachers. The mixed method survey, which assessed characteristics of itinerant teaching, included Likert-type scoring questions and open-ended questions. The qualitative section of this survey was originally developed for Luckner and Miller (1994) and was revised for this study. The researchers surveyed 365 itinerant TODHHs, requesting demographic information. In addition, teachers were asked to provide demographics of an anonymous student on their caseload (similar to Luckner and Miller, 1994), which was selected in a purposeful structure (i.e., putting the names of students in alphabetical order, then selecting the fourth student from the top of the list). The majority of itinerant teachers who responded worked in suburban settings (49%), and the rest split between urban and rural areas. Similar to previous studies (Luckner & Miller, 1994; Luckner & Howell, 2002; Foster & Cue, 2009), the TODHHs who are still working reported that their teacher preparation program largely did not prepare them adequately for work as an itinerant. These

researchers noted that despite the widespread use of the itinerant model, there was no research on best practices.

Antia and Rivera (2016) attempted to document current best practices for itinerant TODHHs as part of a five-year longitudinal study of 197 DHH students who attended general education programs in Arizona and Colorado between 2002 and 2007. They identified research questions related to itinerant service delivery, how decisions are made about the amount of service time provided to each student, and whether there was a relation between students' achievement scores in one school year and the direct academic instruction offered by the itinerant TODHH in the subsequent school year. They conducted detailed mixed method case studies of 25 randomly selected students who were selected using a stratified random sampling process to ensure representation across grades, ethnicity, and hearing losses (however, the researchers did not have IRB permission to collect demographic information on the TODHHs themselves). Percentage of students receiving direct academic instruction in one or more subject areas and percentages receiving direct nonacademic instruction (e.g., self-advocacy, study skills) were calculated over a five-year period. Standardized academic achievement data were collected for all students. To examine the relation between student academic achievement in one year and direct academic instruction the subsequent year, the researchers converted these students' standardized achievement scores for math, reading, and language into Normal Curve Equivalents, and then performed chi-square tests. Students who scored low in reading and language achievement were the most likely to receive instruction in those areas from an itinerant TODHH the following school year. Students who scored low in math were only slightly more likely to receive math instruction from a

TODHH the following year. The case studies included interviews of the student, classroom teachers, itinerant TODHH, and interpreters when applicable. All teachers interviewed were asked two specific questions about TODHH services: How did you decide this student needed the amount of time you are providing? and Given the amount of time you have with this student: how well do you feel you can meet the student's needs? The responses to these questions were transcribed and coded by the researchers. The researchers found that majority of DHH students in the sample received instruction in one or more academic areas from a TODHH. The qualitative interview indicated that many factors influenced decisions about service delivery time provided to DHH students including achievement data, classroom performance, and other support the student was receiving (i.e., time from a speech-language pathologist). In a few instances, itinerant teachers felt obligated to continue to see some students because it was convenient to do so. The quantitative data confirmed that some high performing students received direct instructional support and some low performing students did not. Antia and Rovera (2016) noted in their summary "although IDEA clearly defines how a student qualifies for special education services, there are no guidelines available to assist with the determination of appropriate education service time" (p. 301) related to itinerant TODHHs.

Workforce Research: TODHHs in a single state

Only one study could be located focusing comprehensively on TODHHs working in a single state. Peshlakai (2016) attempted a survey of all itinerant TODHHs working in regional cooperatives throughout Arizona for her doctoral dissertation, to identify their roles and responsibilities, professional development activities, and perceptions and

attitudes toward their work. However, this study did not include comparative perceptions of teachers working in sign language or self-contained environments. Arizona State School for the Deaf and Blind established five cooperatives around the state, which provides itinerant services to public schools. Itinerant TODHHs were asked to complete a modified version of the 2007-2008 Schools and Staffing Survey (SASS), a 25 question quantitative instrument which addressed different aspects of their job and their perceptions and attitudes of itinerant teaching. Two open-ended questions were added for teachers to elaborate on their satisfaction or dissatisfaction, and analyzed as a mixed methods study. At the time of the survey, there were 59 itinerant TODHHs working in the five Arizona cooperatives; 43 of these teachers returned the survey (a 73% response rate). Similar to previous studies on TODHHs, overall these teachers were satisfied in their jobs, but were challenged by paperwork, and the limited amount of resources available to them.

Research Purpose

The TODHH shortage is apparent in Massachusetts, as evidenced by the establishment of the MCDHH Task Force, and reported needs by schools for the deaf and school districts throughout the Commonwealth. How do we solve this problem?

We do not know the backgrounds and work settings of TODHHs who are already working in Massachusetts. This research will identify the current nature of the Massachusetts TODHH workforce in all settings and language instruction methods. The following questions will guide the design of the study: How did they choose to enter their profession? Where did they train? Where are they working (itinerant, school for the deaf or for a school district)? How did they decide to work with students with different

language immersion (ASL or LSL)? What issues did they encounter to become certified as a TODHH?

Research Questions

- What are the reasons that bring teachers into the field of deaf education?
- What are the challenges to becoming a certified TODHH in Massachusetts?
- What is the level of satisfaction for different subsets of Massachusetts TODHHs (teacher experience, deafness status, job responsibility, employment setting) in their work?
- What ideas do current TODHHs working in Massachusetts have to address the shortage in our state?

Collecting data on these questions may help us understand the next steps of how to begin to systematically tackle the TODHH shortage in the Commonwealth.

CHAPTER 3

METHODOLOGY

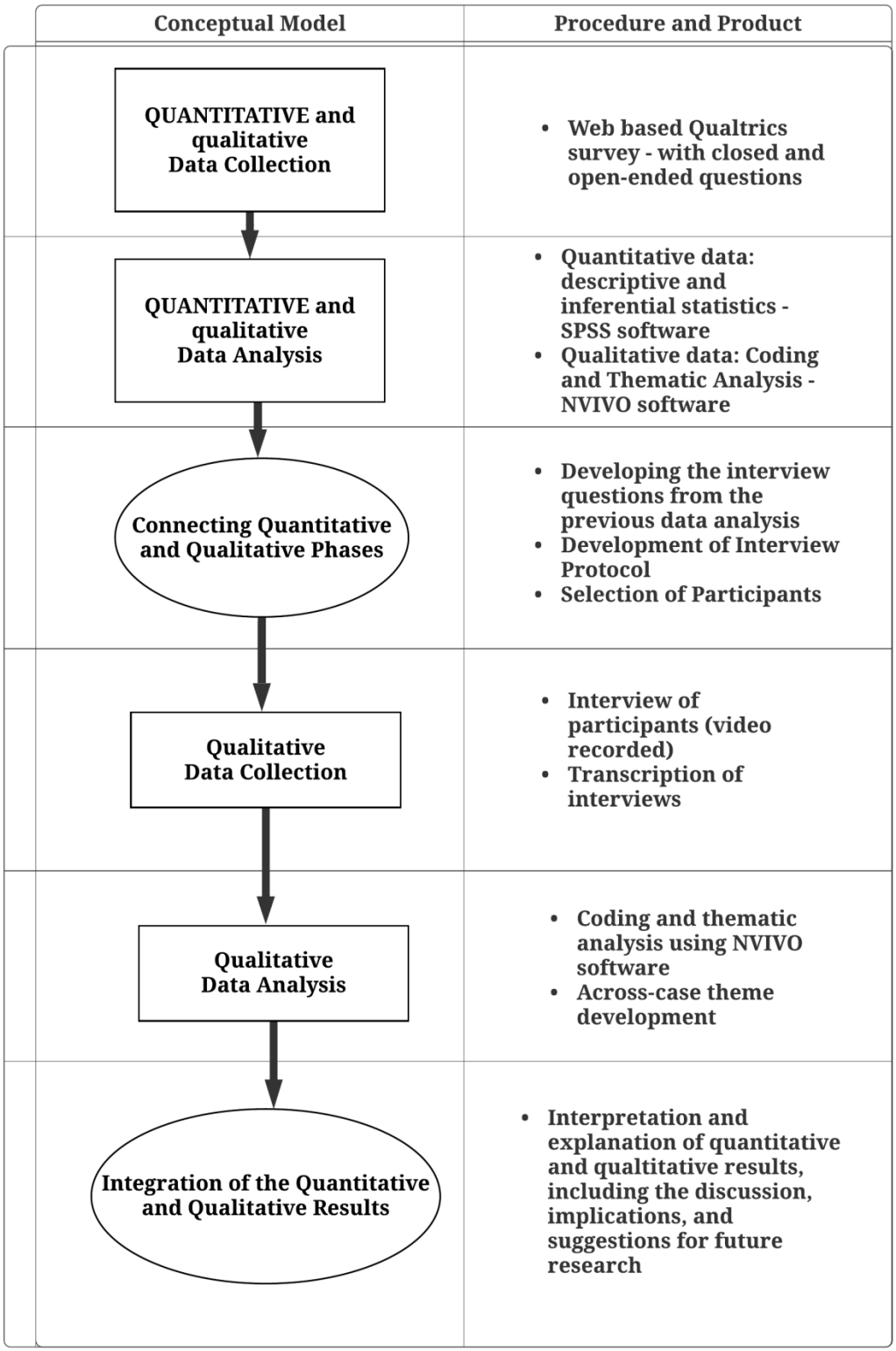
The purpose of this study is to analyze the current Massachusetts TODHH workforce to explore the issue of the significant teacher of the deaf shortage. To address the research questions, a Mixed-Methods Sequential Explanatory Design has been selected (Figure 1). This design approach necessitates collecting and analyzing quantitative data, and then qualitative data in two consecutive phases within one study (Ivankova, Creswell & Stick, 2006; Creswell & Plano Clark 2007). The design of this study was modified to ask additional open-ended questions within the survey which address the research questions. Ivankova (2015) describes that the priority element of data collection and analysis in mixed methods research should be visually represented by capitalizing the quantitative/qualitative priority. As shown in Figure 1, capitalizing QUANTITATIVE places the priority on the survey's quantitative data collection and analysis, however, the qualitative information survey responses are also used to develop questions for the interview phase of the study.

Phase One

Quantitative and Qualitative Data Collection.

In 2003, Luckner and Hanks surveyed a national sample of deaf education teachers on the perceptions of their employment. Luckner and Dorn repeated this research in 2017, updating the Job Satisfaction of Teachers of Students who Are Deaf or Hard of Hearing survey. Dr. Luckner agreed to allow the survey to be used for this

Figure 1. ***Conceptual Model of the Mixed Methods Sequential Explanatory Design (Ivankova, 2015; Ivankova, Creswell & Stick, 2006)***



research. Demographic questions were added to meet the needs of deaf education knowledge in Massachusetts. Questions were added or modified to address the research questions. In this study, the quantitative data will take priority, as indicated in the conceptual model of the Mixed-Methods Sequential Explanatory Design (Ivankova, Creswell & Stick, 2006; Ivankova, 2015) (Figure 1).

Participant Selection

The intention was to survey all teachers who are working with DHH children in Massachusetts, regardless of setting or communication methodology. Respondents needed to either be: a) employed as a teacher working with DHH students in Massachusetts, regardless of their certification area (i.e., they may not have TODHH certification) or b) certified in Massachusetts as a TODHH, regardless if they are currently working with DHH students. Teachers do not need to actually live in the Commonwealth, but must be employed or certified here. I have been in contact with Craig Weller, Supervisor of Data Analysis and Reporting at the Massachusetts Department of Elementary and Secondary Education (DESE). According to DESE, as of October, 2019, 413 individuals were licensed in Massachusetts as a TODHH (C. Weller, personal communication, March 6, 2020). However, this number did not include teachers who have retired or stopped working as a Massachusetts teacher, and remain licensed.

The websites of Massachusetts public school districts that had known TODHHs were searched, and publicly available email addresses of those teachers were added to a database. Email addresses were added as more TODHHs are located. An email list for administrators of deaf education schools and day programs throughout Massachusetts was also created to request distribution of the survey to their teaching staff (e.g., Beverly

School for the Deaf, The Learning Center for the Deaf, Clarke School for Hearing and Speech, Willie Ross School for the Deaf, etc.). In addition, a "Community Partners" list was developed to share the survey with teachers of the deaf and hard of hearing that they might be familiar with (e.g., Deaf and Hard of Hearing Program at Boston Children's Hospital, MA Commission for the Deaf and Hard of Hearing, Boston University Deaf Education Ed.M. program administrators, etc.).

Instrument

The Job Satisfaction of Teachers of Students who Are Deaf or Hard of Hearing questionnaire was created to investigate job satisfaction by a national sample of 608 teachers (Luckner & Hanks, 2003). The original questionnaire consisted of three sections. The first section gathered demographics and requested information about the respondent's professional setting. The second section consisted of 59 statements, scored on a 4-point Likert-type scale: 1. Very Dissatisfied, 2. Dissatisfied, 3. Satisfied, 4. Very Satisfied. The third section consisted of

> open-ended questions asking respondents to comment on challenging and enjoyable aspects of their jobs. Also, respondents were asked to predict how long they thought they would continue working in the field. Finally, the teachers were asked to add additional comments if they desired. (Luckner & Hanks, 2003, p. 8)

In a later publication, this survey was updated by the lead researcher and replicated with a national sample of 495 teachers (Luckner & Dorn, 2017). Another section was added to the original survey, which explained the purpose and provided consent (as this newer version was collected online, rather than a paper version as the previous questionnaire). The demographic and open-response sections were updated and included. The quantitative section contained 65 items in the updated version, which focused on job aspects, with a 4-point Likert satisfaction scale. The researchers determined the

Cronbach's alpha of this instrument was .84, which suggests that the test items have a high internal consistency.

John Luckner, EdD agreed to share this instrument for the basis to survey Massachusetts TODHHs. Questions were reviewed to be determined as relevant to Massachusetts teachers, work locations and research questions. The instrument developed for this study contained 47 of the questions from the Luckner and Dorn (2017) survey. Open-ended questions were added to the survey to allow respondents to respond more in-depth to research questions.

Survey Pilot Process

Once IRB approval was received, the survey piloting process began. An email was sent to six TODHHs (five were hearing; one was Deaf), requesting assistance to pilot the survey (see APPENDIX A). These contacts each had more than 15 years of experience in deaf education, and all lived outside of New England (California, Florida, Georgia, Colorado, and Utah) to ensure that the pilot survey would not be accessed by potential research subjects. Four had worked as TODHHs in Massachusetts schools at some point in their career. Two were professors in deaf education teacher preparation programs, and one was a PhD candidate in deaf education. Four participants responded to the request for piloting assistance, and their feedback was incorporated into the final survey.

Survey Distribution Procedure

An Excel spreadsheet was created, which included contact information of all schools and collaborative programs specifically for deaf children and all known TODHHs working in public schools, available from school district websites or publicly

available web searches. Teachers and administrators were asked to share the survey with other teachers working in Massachusetts, with the goal being a "snowball sample" (Mertens, 2010), to attempt to access non-contacted TODHHs around the state. All administrators of DHH schools and programs were contacted directly by email, with an offer that I could attend a staff meeting to discuss the research and answer any question that teachers have about filling out the survey.

A “Community Partners” list was created of non-educational agencies in Massachusetts which serve DHH children. These agencies also received a request, asking if they would be willing to help distribute the survey. I participate on a state-wide deaf education committee and a teacher shortage subcommittee jointly run by the Massachusetts Commission for the Deaf and Hard of Hearing (MCDHH) and the Massachusetts Department of Elementary and Secondary Education (DESE). The members of these committees were supportive about distributing the survey. A DESE representative indicated initially that DESE would be able to distribute the survey directly to school special education directors. However, the representative indicated later that DESE does not distribute surveys from graduate students, but would provide me with email addresses to distribute the survey myself (L. Viviani, personal communication, February 19, 2020).

The survey was created in Qualtrics and the link distributed from my UMASS email account. The email list was created from the information indicated above and was distributed directly to 76 TODHHs (whose email addresses were publicly available), 492 Massachusetts special education directors of public and charter schools (from the DESE list), and 47 Community Partners, which also included group listervs (e.g., MassDeafTerp

and MA DHH Professionals). During each phase of the distribution, 615 emails were sent through this database. In addition, study flyers were shared with targeted Facebook groups (Voice of the Deaf Community in Massachusetts; Itinerant Teachers of the Deaf; Teachers of the Deaf and Hard of Hearing) and on Twitter. For these broader distributed groups, the survey link was not included, but participants who met the criteria on the flyer were instructed to send me an email and the link was sent to them.

Dillman, Smyth, and Christian (2014) recommended a five-contact strategy to encourage the highest response rate to surveys. They noted that the different strategies should have varying wording to the participants to elicit their interest and involvement in the survey. Their outline of this strategy is noted in Table 6. Description of how data collection was implemented is found in the third column of Table 6. The survey was distributed on February 5, 2020 and closed on April 1, 2020.

At the end of the survey, participants were asked to voluntarily submit their email address to participate in a semi-structured interview, to provide additional qualitative data. People who submitted email addresses were entered in a drawing for a $50 gift card. The data from the quantitative and open-ended survey questions were analyzed according to the process below. From these results, interview questions were developed to investigate questions resulting from the data, as well as probing questions to further answer the research questions.

Table 6. ***Survey Distribution Strategy (Dillman, Smyth, and Christian, 2014)***

Strategy	Time Frame	Modification for this study
Pre-notice letter (e.g., informing participants that they will get a survey to complete)	Prior to the survey commencing	Schools for the deaf were contacted with the request to present information about the survey during a regularly scheduled staff meeting. Presentation dates were scheduled for six different DHH schools between February 6 and March 20, 2020 (and scheduling was in process of discussion with several other schools/programs)
Questionnaire mailing		The questionnaire was emailed to all school for the deaf administrators, public school teachers on file, "snowball" Community Partners, and special education directors. Completed February 5, 2020
Thank you reminder	One week following questionnaire mailing	This phase was not implemented
Replacement questionnaire	14 days following the thank you reminder	Email sent to all school for the deaf administrators, public school teachers on file, "snowball" Community Partners, and special education directors. Completed February 28, 2020
Final reminder	10 days following the replacement questionnaire.	Email sent to all school for the deaf administrators, public school teachers on file, "snowball" Community Partners, and special education directors. Completed on March 20, 2020

Extenuating Circumstances

The survey was initially distributed on February 5, 2020 to email addresses in my database, as well as to every special education director in Massachusetts public and charter schools, from a database supplied by DESE. Schools and programs for DHH students were all contacted with the intention of explaining the study to their teachers and answer their questions. Six presentations were initially scheduled and discussions were occurring with other programs around mutually agreeable dates. Reminder emails were sent to all email addresses on February 28, 2020.

On March 11, the 2019 novel coronavirus ("COVID-19") was declared a worldwide pandemic by the World Health Organization, and Massachusetts Governor Charlie Baker initially closed schools from March 16-April 6, 2020 (MA Office of the Governor, 2020, March 15). On March 25, 2020 Governor Baker issued a second Order, closing schools through May 4 (MA Office of the Governor, 2020, March 25). On April 21, 2020 Governor Baker's third Order closed physical schools for the duration of the 2019-2020 school year (MA Office of the Governor, 2020, April 21).

At the time of the March 11 Order, only four of the originally scheduled presentations were completed, and the rest were cancelled by the schools. To make the information as evenly accessible throughout the state, I created a video using the original presentation PowerPoint. The video was presented in American Sign Language, with voiceover in spoken English, and captioned, to be accessible to all hearing, hard of hearing and deaf teachers (Meyer, 2020, March 16). This presentation was distributed to every administrator of schools/programs for DHH students (including the schools previously visited), letting them know they could share it with their staff. The video link was also shared in the final reminder email sent to all distribution addresses on March 20, 2020.

Research within the Boston Public Schools (BPS), which includes Horace Mann School for the Deaf, requires an additional IRB process. This separate IRB process requires that the university IRB approval be part of the BPS IRB application. BPS has three separate research application windows: October 1-31; February 1-28; June 1-20 (Boston Public Schools, 2020). The University of Massachusetts IRB was approved December 12 and, subsequently, the BPS IRB was submitted within the February, 2020

application window. However, due to the COVID-19 crisis, BPS research applications were put on hold for the 2019-2020 school year, and I made the decision to close the survey on April 1, 2020. A review of the surveys indicated that 179 people (out of 187, or 95%) started the survey prior to the March 16 school shutdown.

Phase One – Quantitative

The quantitative data were downloaded from Qualtrics and analyzed using the IBM SPSS 26 Statistical Software Package (IBM Corp., 2019) and analyzed using descriptive and inferential statistics. Analysis of variance (ANOVA) were conducted to determine if the dependent variable of job satisfaction is impacted differently by the independent variable groups: teacher deafness status (D/deaf, hard of hearing, hearing); employment type (itinerant, early childhood, elementary, secondary), employment setting (school for the deaf, public school, collaborative), and years of teacher experience.

Phase One – Qualitative

The qualitative answers from the survey were analyzed using NVivo 12 software (QSR International Pty Ltd., 2018). Open set answers were uploaded verbatim into the software. For the initial coding, I read all of the text and created an initial set of nodes (i.e., identifying significant words and short phrases that address the question asked or the topic discussed). A coding protocol and codebook was developed (Appendix C) and shared with the Coder 2. Within the coding protocol, the following instructions were emphasized: *These nodes are suggestions. If you have other nodes you think fit better, please code them as such, and keep track of your questions in a memo, which we will discuss.* Coder 2 for this section of the analysis was a doctoral candidate who recently

defended her PhD in deaf education at a Midwestern university, had experience coding qualitative data, and experience with NVivo 12 software.

Qualitative responses to the following open-set questions, which address the research questions, were analyzed (Table 7):

Table 7. ***Open Set Survey Questions Analyzed***

File name	Question asked
Q49-ChallengePassingMTELs	What were your challenges passing the MTELs and becoming certified in Massachusetts?
Q54-HowMuchLongerIntendToWork	How much longer do you intend to work as a teacher with deaf/hard of hearing children? (provide a time period: months or years)
Q55-ReasonsLeaveTeaching	What will be the likely reason that you will leave teaching in a Massachusetts school?
Q56-RecruitmentIdeas	We are experiencing a teacher of the deaf shortage. What ideas do you have for recruiting people into our field?
Q57-UnansweredQsOrExplanations	Is there anything you would like to include, that wasn't asked? (Or if you would like to expand on a previous answer)

Coder 2 and I completed asynchronous coding, where we used the codebook to code the text separate from each other, and then I merged the files to compare them (Duke University, 2019). At the end of this initial coding process, the Coder 2 returned her coded file ("saved as" with the new date), back to me. I merged the two files (my codes and from Coder 2) in a new project in NVivo.

Phase Two

In Phase Two of this Mixed-Methods Sequential Explanatory Design, semi-structured interview questions were developed to further explore the quantitative analysis and qualitative themes identified in Phase One.

Participant Selection

Respondents interested in being interviewed about their experiences working as a TODHH in Massachusetts included their email address at the end of the survey. Maximal variation sampling, which is purposefully selecting individuals that differ on some characteristic (Ivankova, 2015), was used. Participants including email addresses were asked to complete a brief additional survey, which asked to select the demographics that applied to them (Table 8).

Table 8. ***Demographic options selected by interview participants***

Employment Type	Teacher Deafness Status	Language of Instruction
Early Childhood Elementary Secondary Itinerant	Deaf Hard of Hearing Hearing	American Sign Language Spoken English

The email addresses for each of these variable groups were put into an Excel list, and one email for each variable was randomly selected, using the Excel function (=RANDB) (Random number between) to randomly select a number, which corresponded to the email address of each attribute. The selected teacher was then contacted via email. They were informed that they were selected for an interview and could respond if they wanted to participate or not. If the teacher did not want to participate, then another email address was randomly selected using the same process.

Interviews

Based on the results of the quantitative and qualitative survey results, semi structured interview questions were developed to address the research questions. The interview questions (Appendix D) were shared with interviewees prior to the scheduled interviews. Participant interviews were conducted via the Zoom online videoconferencing

platform and were recorded. For TODHHs who were Deaf or hard of hearing, the interviews were conducted in the communication methodology of their choosing (e.g., American Sign Language, spoken English, or any combination led by their preference). I am fluent in ASL and regularly participate in meetings with Deaf colleagues without an interpreter. Video-collected data were necessary for all participants – to accurately and fully capture data of interviews conducted in American Sign Language (Anderson, et al., 2018) and to ensure complete understanding and accurate transcription of teachers using spoken English due to my own reduced hearing. Questions were developed from the results of the survey. These questions were emailed to participants prior to the scheduled interviews. Questions were generally asked in the order presented, but a semi-structured interview process was conducted. Participants were encouraged to expand on their comments and additional questions were asked for clarification. Interviews took place over five weeks in June and July, 2020.

Phase Two Coding Process

Interviews conducted in spoken English were transcribed verbatim by Scribblr (wwwscribblr.ai). The interview conducted in ASL was transliterated into spoken English by me. Questions about translation were clarified directly with the Deaf teacher.

Notes were taken during each interview. Following each interview, a half hour was set aside for reflection and additional note writing. Once transcripts were received from the transcription company, every interview was watched again while reading the transcript to ensure accuracy in the transcription. Identifying information was redacted from the transcript to protect anonymity. Following this confirmation process, each transcript was read twice at minimum. While reading, significant words and short phrases

were highlighted and memos written in the margins that addressed the topic discussed. These notes and phrases were transferred into an Excel spreadsheet, one column for each interview participant. Following each interview, as notes for each participant were added to the spreadsheet, comparisons, patterns, and ideas for combining codes into broader categories were noted across participants. Following the final interview, the entire spreadsheet was reviewed and additional combining of these patterns and codes took place. Codes that were common across participants were identified and grouped under headings within the same spreadsheet. From these codes, "themes" or broad patterns of meaning across coded data were identified which tied groups of codes together (Nowell, et al., 2017; Braun & Clarke, 2006).

To develop the interview codebook, the spreadsheet and printed interviews were shared with Coder 2, the same person who coded the qualitative survey responses in Phase One. These codes were discussed via a Zoom call prior to NVivo coding. The coding protocol, originally developed for the survey, was updated with interview information and followed again. Coder 2 was encouraged to identify additional codes as she coded the interviews. The protocols and codebooks are located in Appendix C. Coder 2 and I followed the same process as the Phase One qualitative analysis: completing asynchronous coding, where we used the codebook to code the text separate from each other, and then I merged the files in a new NVivo project to compare them.

CHAPTER 4

This mixed-methods sequential explanatory study was conducted in two sequential phases: a survey and follow-up interviews. Analysis of the quantitative and the qualitative data were completed separately, and then merged to address the research questions. They are presented separately in this chapter.

Quantitative Analysis

Quantitative analysis of the survey included descriptive statistics of demographic information of teachers across Massachusetts who were teaching DHH students, as well as licensed TODHHs who were no longer teaching DHH children. Demographics of current teachers, holding any teaching license, were explored further. Analysis of the teacher satisfaction section of the survey was compared across demographic variables.

Demographics of Massachusetts teachers of DHH students

DESE reports that as of October, 2019, 413 individuals were licensed in Massachusetts as a TODHH (C. Weller, personal communication, March 6, 2020). However, this number also includes teachers who have retired or stopped working as a Massachusetts teacher and continue to be licensed. The intention of this study was to capture the Massachusetts population working with DHH students, including licensed TODHHs and teachers directly teaching children, but held a different (non-deaf education) teaching license, as well as attempting to locate licensed TODHHs who were no longer teaching.

One hundred-eighty-six people began the survey, and 177 continued through to the questions of current employment. These 177 participants included licensed TODHHs (currently teaching and not) and classroom teachers of DHH students, who were not

licensed in deaf education. Of this group, 148 participants indicated that they have a degree in deaf education, which represents 36% of the total active Massachusetts TODHH licenses. Table 9 provides the demographic information from participants who began the survey.

One hundred-fifty-two participants indicated they graduated with degrees in deaf education (or were currently enrolled in a deaf education preparation program). Teachers who did not have a degree in deaf education reported receiving university degrees in the following majors: linguistics, communication disorders, early childhood education, elementary or secondary education, English as a second language, special education, moderate disabilities, or severe disabilities.

Table 9. ***Demographics: All Survey Participants***

	Responses	**Percentage of total**
Gender		
Female	160	90.4%
Male	12	6.8%
Self-Describe/non-binary	5	2.8%
Deafness status		
Deaf	20	10.3%
Hard of Hearing	7	4%
Hearing	150	84.7%
Race - US Census categories		
Asian	2	1.1%
Black/African American	1	.6%
White	170	96.6%
Two or more races	3	1.7%
Ethnicity - US Census categories		
Hispanic/Latino	5	2.8%
Non-Hispanic/Latino	171	97.2%
Highest degree earned		
Bachelor's degree	8	4.5%
Master's degree	147	83.1%
Educational specialist/CAGS	14	7.8%
Doctorate	8	4.5%

Table 10 further explores the educational background of survey participants, and the licensure and tuition funding support information from respondents who have a degree in deaf education. The 80 TODHHs who received funding/tuition waivers to attend graduate school, were then asked if funding were not available would they have paid tuition or taken loans to receive a graduate degree in deaf education? Only 33 teachers of this group indicated they *definitely would* have taken on personal debt to become a teacher of DHH students if funding was not available.

Table 10. ***Demographics: survey participants' education background***

	Responses	**Percentage of total**
Was teaching degree obtained from a Massachusetts university?		
Yes	100	56.5%
No	77	39.5%
Do you have a degree in deaf education?		
Yes	148	83.6%
No	25	14.1%
Currently enrolled in a deaf education graduate program	4	2.4%
These questions were only asked of teachers with a deaf education master's degree: **What Massachusetts deaf education license do you have?**		
DHH (no language/communication mode listed)	49	26.8%
DHH: ASL/TC	52	28.4%
DHH: Oral/Aural	31	16.9%
Licensed TOD in another state	20	10.9%
Currently enrolled in a DeafEd grad program	4	2.2%
Requested/Received a DESE DHH waiver	6	3.3%
Not DeafEd licensed in any state	21	11.5%
Did you receive funding to become a TODHH?		
Yes	80	53.3%
No	70	46.7%

Responses regarding participant TODHH licenses from Table 10 were compared with licensure data provided by DESE in Table 3 to determine the percentage of total licenses represented by survey participants (Table 11).

Table 11. ***Total DESE licenses compared to survey responses***

DESE License Designation	DESE licenses active through 2019-2020	Survey responses	% responses/ active licenses
Children with Special Needs: Audition	66	49	19%
Children with Sensory Handicaps: Audition	12		
Teacher of the Deaf	1		
Teacher of the Deaf and Hard of Hearing	175		
Teacher of the Deaf and Hard of Hearing [ASL/TC]	89	52	58%
Teacher of the Deaf and Hard of Hearing [Oral/Aural]	62	31	50%
Total "newer" license designations (since 2015)	**151**	**83**	**55%**
Teachers holding both the ASL/TC and Oral/Aural licenses	8	Not asked	
Total <u>all</u> licenses through the 2019-2020 school year	**413**	**132**	**32%**

Note. Greyed out cells above indicate older license names, which are still active.

In total, 32% of teachers with any DESE TODHH license designation participated in the survey. TODHHs with "older" license designations comprised 19% of the total obsolete licenses. Fifty-eight percent of TODHHs with the ASL/TLC license completed the survey as did 50% of the TODHHs with the Oral/Aural license. Teacher responses with these "newer" licenses comprised 55% of total TODHHs licensed since 2015. This was a forced-choice survey question, so it is unknown if any of the participants had both

the ASL/TC and Oral/Aural licenses. In addition, DESE's records indicate that seven people are teaching on TODHH waivers and six responded to the survey.

Addressing the research question, *What are the reasons that bring teachers into the field of deaf education?* 61% had personal experience with a DHH person that influenced their decision. I wanted to learn at what point in their lives these TODHHs realized that they wanted to be teachers (in general) (Figure 2) and when they wanted to be teachers of DHH students (Figure 3). The average age respondents indicated they wanted to be teachers was about 16 ½ years old and the age they knew they wanted to be teachers of DHH students was 21 years old. A paired sample t-test indicated there was a significant difference between average ages for these life decisions (t_{165} = -9.749, p < 0.001).

Figure 2. ***Participant ages when they knew they wanted to be a teacher***

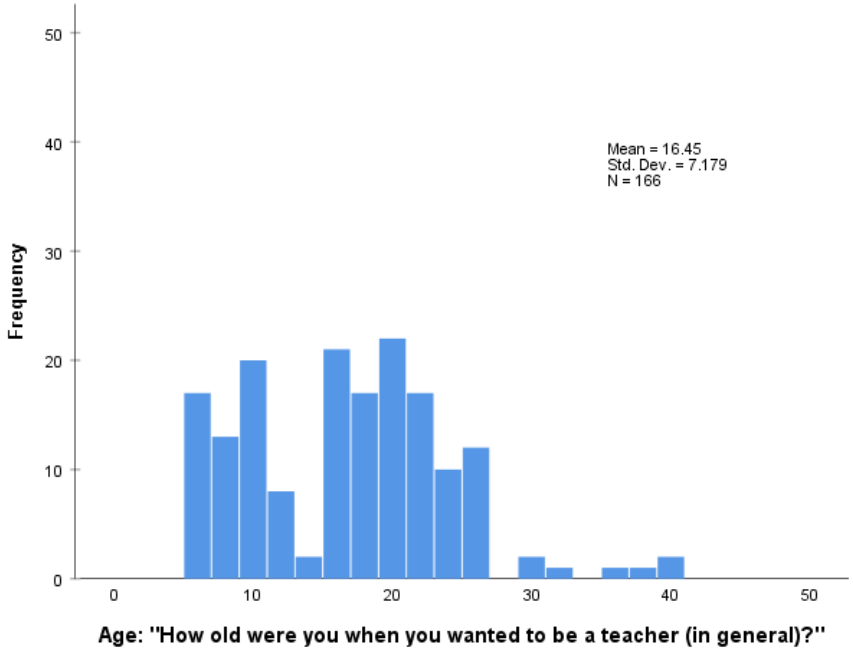
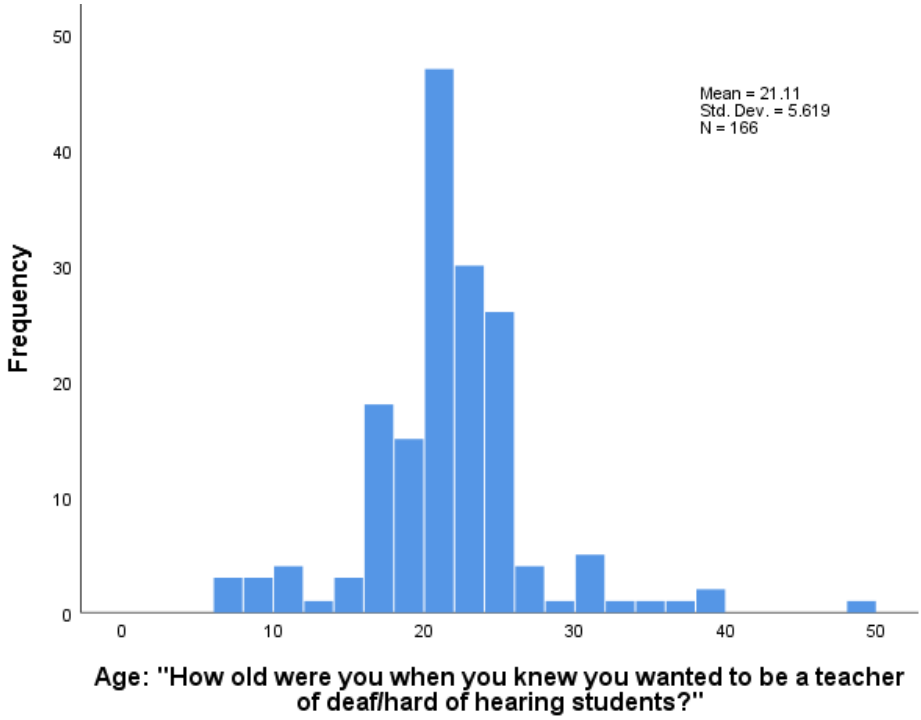


Figure 3. ***Participant ages when they knew they wanted to be a teacher of deaf students***



Teachers identified the university deaf education teacher preparation program from which they graduated/are a current student (Table 12). Boston University (which trains teachers using a bilingual ASL-English approach) and Smith College (now closed; focusing on listening-spoken language teacher training), represent half of all Massachusetts TODHHs. Nearly 80% of Massachusetts TODHHs graduated from a physical university, located within the northeast/mid-Atlantic region. Of the 26 different deaf education teacher preparation programs represented, seven are currently closed, including four in the northeast region (Deaf Education Teacher Preparation Programs (n.d.)). These shuttered programs represent 32% of all Massachusetts TODHHs.

Table 12. ***Deaf Education Teacher Preparation Programs Represented in 2019-2020 MA Workforce***

Deaf Education Teacher Prep Program	Responses	Percentage of total
Massachusetts universities		**50.6%**
Boston University	41	27.3%
Smith College*	35	23.3%
Northeast universities (outside MA)		**14%**
New York (Columbia; Hunter; NTID; Canisius*; NYU*)	20	
University of Hartford (CT)*	1	
Mid-Atlantic universities		**14.6%**
Gallaudet University (Washington DC)	10	
Bloomsburg University (PA)	2	
McDaniel College (MD)	10	
Southern universities		**2%**
Flagler (FL)	1	
University of TN-Knoxville	2	
Midwestern universities		**8%**
Illinois State	3	
Ball State (IN)	1	
Washington University (MO)	2	
Ohio (University of Cincinnati*; Kent State)	4	
Michigan State	2	
Western universities		**6%**
University of Arizona (AZ)	2	
Lewis & Clark College (OR)	1	
California (San Jose State*; USC*; CSU Northridge)	7	
Online		**4%**
Fontbonne University (MO)	2	
St. Joseph's University (PA)	4	

Note. *TODHH teacher preparation program that is closed/no longer accepting students

After completing demographic information, survey participants were asked to identify their current employment setting. For TODHHs who were not currently teaching DHH school-aged students, the survey asked what kind of job they were currently doing and then the survey ended. Teachers reported that they were: teaching only hearing students or post-secondary transition students, working as a school administrator or teacher's aide, retirement, or left the education field completely. Table 13 indicates the 34

respondents who were no longer teaching DHH school-aged students, and the DESE license they reportedly held.

Table 13. ***Licensed TODHHs but not currently teaching preschool through secondary DHH students***

MA DESE DHH teaching license	Teach hearing students	Transition	Administrator	Teacher Aide	Retired	Other	TOTAL
DHH (no language specified)	1	1	4	0	1	3	**10**
DHH: ASL/TC	0	1	5	0	1	5	**12**
DHH: Oral/Aural	1	0	0	0	0	3	**4**
Licensed TOD in another state	0	2	2	0	1	2	**7**
DESE DHH waiver	0	0	0	1	0	0	**1**
TOTAL	**2**	**4**	**11**	**1**	**3**	**13**	**34**

Current teachers of DHH students

One hundred and nineteen current teachers of DHH students (with any DESE licensure) continued to answer questions about their current teaching situation; however, questions could be skipped so responses for each question could be lower.

Employment demographic information for current teachers of DHH students is summarized in Table 14, including their deaf education degree status, employment type, and information about their employment and caseload.

Table 14. ***Employment Demographics of Current Massachusetts Teachers of DHH students***

	Number	Percent
Has a degree in deaf education		
Yes	101	88.6%
No	11	9.6%
Currently enrolled in a deaf education program	2	1.8%
Employment type		
Early Childhood	13	10.9%
Elementary	25	21.0%
Secondary	37	31.1%
Itinerant (working in multiple buildings in a single district)	17	14.3%
Itinerant (working in multiple school districts)	27	22.7%
Agency Employed By		
School for the deaf	72	62.1%
Local public school	28	24.1%
Collaborative	13	11.2%
Other (private agency, independent contractor)	3	2.6%
Full/Part Time Employment		
Full-Time	98	84.5%
Part-Time	18	15.5%
Calendar Year Position		
10-months	59	50.9%
11-months	46	39.7%
12-months	11	9.5%
Caseload (total number of students)		
1-6	24	20.7%
7-12	26	22.4%
13-18	10	8.6%
19 or more	56	48.3%
Caseload (direct service delivery)		
1-6	40	35.3%
7-12	31	27.4%
13-18	14	12.4%
19 or more	28	24.8%
Caseload (consultation to General Education teachers)		
1-6	21	18.1%
7-12	16	13.8%
13-18	4	3.4%
19 or more	25	21.6%
No consultation to General Education Teachers	50	43.1%

A breakdown of current teachers by job responsibility and the teacher's own reported deafness status is found in Table 15.

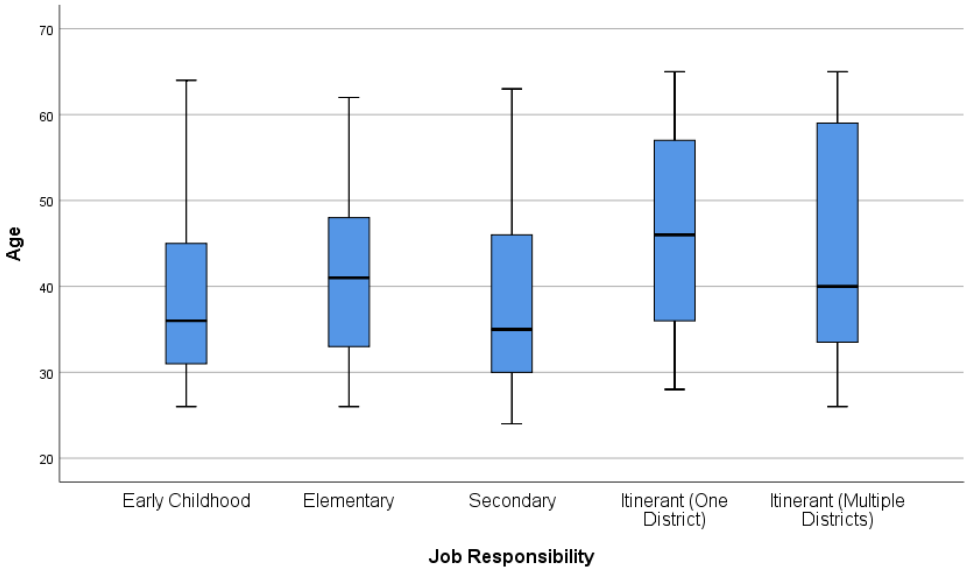
Table 15. ***Current teachers of DHH students by job responsibility and teacher's deafness status***

Job Responsibility	Teacher's Deafness Status		
	D/deaf	*Hard of Hearing*	*Hearing*
Early Childhood	0	0	13
Elementary	5	1	19
Secondary	9	3	25
Itinerant (Single District)	1	1	15
Itinerant (Multiple Districts)	2	1	24
Total current teachers completing demographic questions	**17**	**6**	**96**

Note: N=119

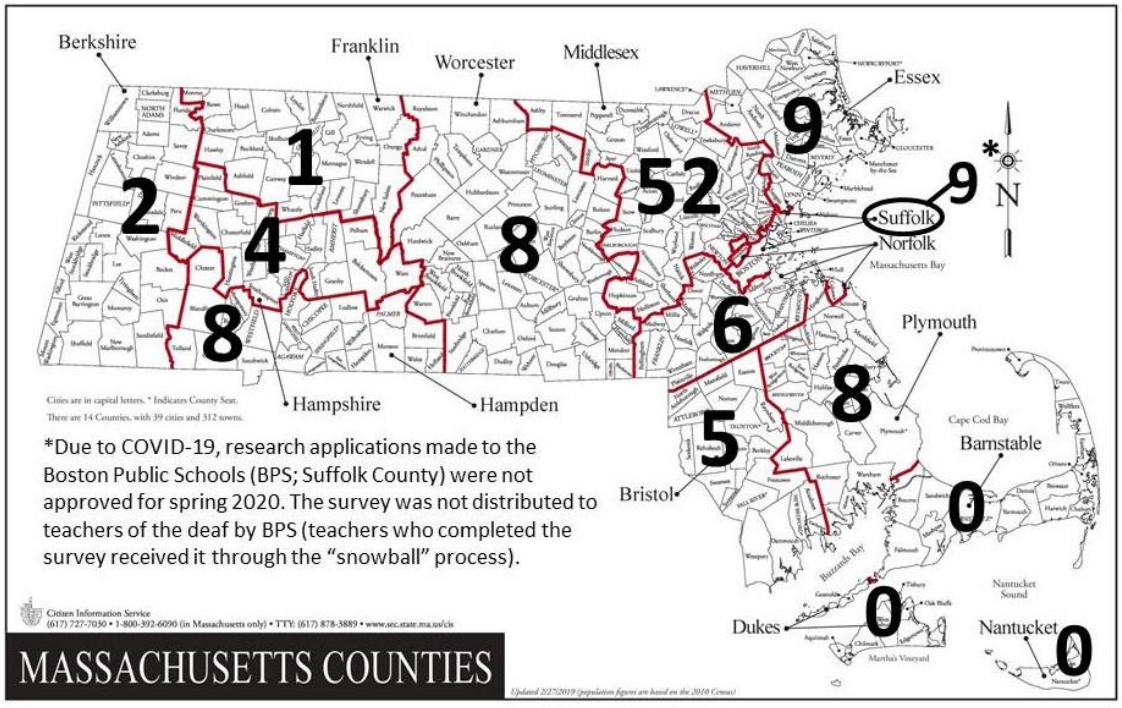
The median age of all teachers of DHH students is 41 years old, with the age breakdown by job responsibility indicated in Figure 4.

Figure 4. ***Median ages of current Massachusetts teachers of DHH students, by job responsibility***



Teachers were asked to identify the Massachusetts county where their school was located (or in the case of itinerant teachers who work in several school districts, identify the county where the majority of schools were located). Figure 5 identifies the breakdown of the 112 teachers who responded. A research application was made to the Boston Public Schools to comprehensively include the itinerant teachers and teachers who work at the Horace Mann School for the Deaf in Allston. However, due to COVID-19, research applications were not approved for the duration of the 2019-2020 school year. The DESE website indicates that in the 2018-2019 school year, Horace Mann School for the Deaf employed 37.6 FTE teachers and an additional six TODHHs worked as itinerant teachers throughout the Boston Public Schools (MA DESE 2019). For this survey, nine teachers responded that they worked in Suffolk County (Boston), which likely was reached through a "snowball" approach.

Figure 5. ***MA county map of current teachers' employment locations***



Teacher Satisfaction

Luckner and Hanks (2003) conducted a satisfaction survey of 608 TODHHs recruited nationally. Luckner and Dorn (2017) conducted a replication study with 495 TODHHs. In this current study, 114 teachers of DHH students, only from Massachusetts, completed this section of the survey (and responses for every question was required). To identify positive and negative trends *very dissatisfied* and *dissatisfied* responses were combined, as were *satisfied* and *very satisfied*. The majority of survey responses were positive, scored by more than 50% of participants. Table 16 indicates the top ten job responsibilities that the group as a whole identified as being *satisfied* and *very satisfied*. Table 17 outlines the job responsibilities that were reported as *very dissatisfied* and *dissatisfied.* Both tables include comparisons to the Luckner and Hanks (2003) (indicated in the 2003 column) and Luckner and Dorn (2017) (indicated in the 2017 column) data, indicating the order that the item was ranked in that particular study.

Table 16. ***Items most frequently identified as "satisfied" or "very satisfied"***

Item	Percent	2003	2017
Structuring lessons and experiences that promote learning	92	4	9
Importance and challenge	91	3	1
Working with students from diverse cultures	91	--	8
Working with a wide age range of students	90	10	6
Explaining important vocabulary and concepts	88	6	2
Attending/contributing to IEP meetings	87	--	5
Opportunity to use past training and education	83	2	3
Teaching complex subject matter	83	--	--
Number of students on caseload	82	--	--
School safety	82	--	7

Note. 2003 column refers to ranking of that satisfaction item in Luckner & Hanks, 2003.

2017 column refers to ranking of that satisfaction item in Luckner & Dorn, 2017.

Table 17. ***Items most frequently identified as "dissatisfied" or "very dissatisfied"***

Item	Percent	2003	2017
State assessment test for students	77	2	1
Availability of appropriate tests for students	64	6	7
Time for non-teaching responsibilities	59	4	8
Professional development related to deaf education	56	7	3
Time to collaborate with school staff	55	9	5
Providing students with deaf adult role models	50	5	2
Time to collaborate with families	49	10	9
Family involvement	48	3	6
Salary and fringe benefits	47	--	--
Teacher evaluation system	47	--	10

Note. 2003 column refers to ranking of that dissatisfaction item in Luckner & Hanks, 2003. 2017 column refers to ranking of that dissatisfaction item in Luckner & Dorn, 2017.

To address teacher satisfaction of the "job as a whole" by job responsibility, Table 18 displays the combined "satisfied/very satisfied" and "dissatisfied/very dissatisfied" percentages by group.

Table 18. ***Satisfaction level percentage of "job as a whole" by job responsibility***

Job as a whole	All respondents	Early Childhood	Elementary	Secondary	Itinerant (One District)	Itinerant (Multiple Districts)
satisfied or *very satisfied*	85.09%	72.73%	87.50%	83.33%	88.24%	88.46%
dissatisfied or *very dissatisfied*	14.91%	27.27%	12.50%	16.67%	11.76%	11.54%

One-way between-groups analyses of variance (ANOVA) were conducted to explore the impact of independent variable groups on the dependent satisfaction rating of *job as a whole*. The ANOVA by *job responsibility* (early childhood, elementary, secondary, itinerant) on the *job as a whole* satisfaction rating produced a result that was

not statistically significant ($F(4,109) = .567$, $p=.687$). The ANOVA by *teacher deafness status* (D/deaf, hard of hearing, hearing) on the *job as a whole* satisfaction rating also produced a result that was not statistically significant ($F(2, 111) = .795$, $p=.454$). In addition, the ANOVA by *employment setting* (schools for the deaf, local public school, collaborative) on the *job as a whole* satisfaction rating also produced a result that was not statistically significant ($F(3,110) = 1.356$, $p=.260$). A Kruskal-Wallis Test, a non-parametric test, was selected to compare *job as a whole* across teachers grouped by *years of experience*, because the dataset violated the homogeneity assumption of ANOVA. The Kruskal-Wallis results revealed a statistically significant difference $H(3)= 9. 67$, $p =.022$ (Table 19). In a pairwise comparison of groups, there was only one significant comparison, between the 0-10 years vs. 21-30 years of experience groups ($p=0.031$).

Table 19. ***Teacher satisfaction of job as a whole by years of experience***

Group	Years of teaching experience	n	Mean
1	0-10 years	45	2.87
2	11-20 years	31	3.03
3	21-30 years	23	3.27
4	31-40 years	15	3.06

Qualitative Analysis – Survey

Qualitative coding of the survey data was completed with a second coder, following a coding protocol. Inter-rater reliability between the two coders was established. Survey codes were then analyzed using thematic analysis.

Inter-Rater Reliability

Following the coding protocol and initial codebook (Appendix C), both coders independently coded each response in NVivo 12. Nodes were specifically developed for Q49, Q54, Q55 and Q56 (Table B2), however, any node could be used for any question, and development of new nodes was encouraged. Specific nodes were not developed for Q57, as it was an open set question, where respondents could expand on information previously provided, or provide information that was not asked. For Q57, the protocol indicated to use any node that was previously created for other questions, or to create new nodes. Following the initial coding by both coders, a Coding Comparison Query was run in NVivo, which calculated the inter-rater reliability (IRR) percentage agreement. Table 20 indicates the IRR for each question.

Table 20. ***Initial Inter-Rater Reliability Percentage Agreement***

File name	Initial Inter-Rater Reliability
Q49-ChallengePassingMTELs	85%
Q54-HowMuchLongerIntendToWork	90%
Q55-ReasonsLeaveTeaching	88%
Q56-RecruitmentIdeas	99%
Q57-UnansweredQsOrExplanations	58%

Four files had IRR agreements of ≥85%. Both coders met via Zoom to discuss each disagreement in these four files, as well as memos created, and the *To Be Discussed* node. The majority of disagreements was errors in coding or overlooked codes ("oops, I didn't see that!"), or that the codebook descriptions were not explicit enough for both coders to reach the same coding conclusion. These disagreements were easily resolved in a Zoom meeting, and notes taken on the changes.

The fifth file, Q57, had poor IRR agreement. This is understandable, given the open-ended nature of the question, as well as the vague protocol instruction for Q57: "use

the nodes created for the other questions" (Appendix C). A separate Zoom meeting was called to discuss all of the responses to Q57. Using the Zoom screen-share feature, both coders could see the responses on the screen. Every participant's response to this question was reviewed and coders discussed every disagreement in addition to the memos created, and the *To Be Discussed* node. As a result of this discussion, the descriptions of several nodes were expanded, and additional examples included in the descriptions, in order to be explicit about the nodes. It was through this process that the coders came to agreement on all data coding, and the codebook was updated to reflect these node changes. During this meeting the Coding Protocol was also reviewed to ensure that it was followed or changes were made to the Coding Protocol to reflect what actually took place (e.g., both coders initials are similar: KM/KPM. We originally intended to use wildly different initials to ensure visible ease during the Coding Comparison Query analysis. This did not work out as planned, and we ended up using our own initials. Thank goodness for the ability to enlarge screen text).

Massachusetts teacher certification challenges

The open-ended question, "what were your challenges passing the MTELs and becoming licensed in Massachusetts?" elicited a variety of responses. As with any test, there was a group of teachers who reported no concerns with passing the MTEL or obtaining their Massachusetts teaching license. Twenty-one of the respondents reported they received a "grandfathered" Massachusetts license (after moving here with another state's TODHH teaching license), or received their Massachusetts teaching license prior to the establishment of the MTEL requirement. However, many participants who had challenges took the opportunity to share their experiences.

Responses to this question fell along three thematic lines: preparation challenges, duplication frustration, and identifying subtest concerns. When participants prepared to take the MTELs, expense and barrier issues related to studying for the tests were identified most often in the responses. Table 21 identifies representative in vivo comments for these sub-themes.

Table 21. ***MTEL Preparation Challenges***

Preparation Challenges	Sub-themes	Representative in vivo comments
Expense	Taking review courses	"I passed, but had to take a prep class for the math, which cost $500."
Expense	Costs associated with taking MTELs or Repeated testing	"Definitely the money involved in taking these MTELs. They cost so much money, especially if you fail any of them. And there is no help/support when it comes to paying for these tests." "I was certified in multiple states, with years of teaching experience, I found it frustrating that I had to take all of the same tests as a new teacher in my field, not because it was difficult, but because of the expense."
Studying	Feeling "prepared"	"I passed on the first try; however, I do not think my teacher prep program prepared us for the exam." "I participated in two prep courses and hired a tutor. Took the elementary math and general curriculum MTELs three times each and passed the third time."

Preparation Challenges	Sub-themes	Representative in vivo comments
Studying	Resources	"I grew up in NY and the bookstores sold books to help teachers prepare for state tests. However, when I moved to MA, there were NO books that provided study tools and notes." "After requesting tutoring from more experienced colleagues through administration, I was denied. Knowing what tests were needed and navigating the red tape in transitioning my certification from another state without support was a five year struggle." "MTEL courses should be provided in ASL for Deaf teacher candidates"
Studying	Time priorities: family and employment commitments	"It was time consuming to pass the tests while also finishing up my graduate program" "The time to study and prepare for the test itself was difficult…when I took the MTEL, I had grad school, full time job, mother of three school aged children and a husband to juggle my time."

Participants described "duplication frustration," or repeating requirements previously completed, in order to meet the Massachusetts standard for licensure. Table 22 identifies representative in vivo comments for these sub-themes.

Table 22. ***Duplication frustration obtaining Massachusetts teacher licensure***

Duplication Frustration	Representative in vivo comments
Previously holding an out-of-state license	"I was a certified teacher for 10 years in Pennsylvania. Moving to Massachusetts, I had to take the MTELs. It was a frustrating after teaching for 10 years that MA didn't accept my out of state license." "The biggest challenge for me was not recognizing that certification from another state would not have full reciprocity when I accepted a position in MA in 1998."

Duplication Frustration	Representative in vivo comments
Previously passing tests that were not accepted for Massachusetts licensure	"I was required to take 7 licensure exams and Massachusetts did not accept them. The exams covered the same topics and requirements, and I felt frustrated having to pay for them all over again." "The fact that I had to pay to take the MTELs after passing all of the same tests with the Praxis. Additionally, scheduling the SLPI was a 4-month process, again, in spite of having already taken the same test (ASLPI). It felt like a bunch of unnecessary and costly barriers, when I had already proved my competency." "I don't expect to leave MA. Passing all the MTELs was hard enough, why would I want to do it again in another state?"

Many survey participants chose to discuss their unique challenges passing specific MTEL tests. The individual tests were coded and the number of responses mentioning specific MTEL tests is found in Figure 6. Table 23 identifies comments about challenges to taking specific MTEL tests.

Figure 6. ***Number of responses mentioning specific MTEL tests***

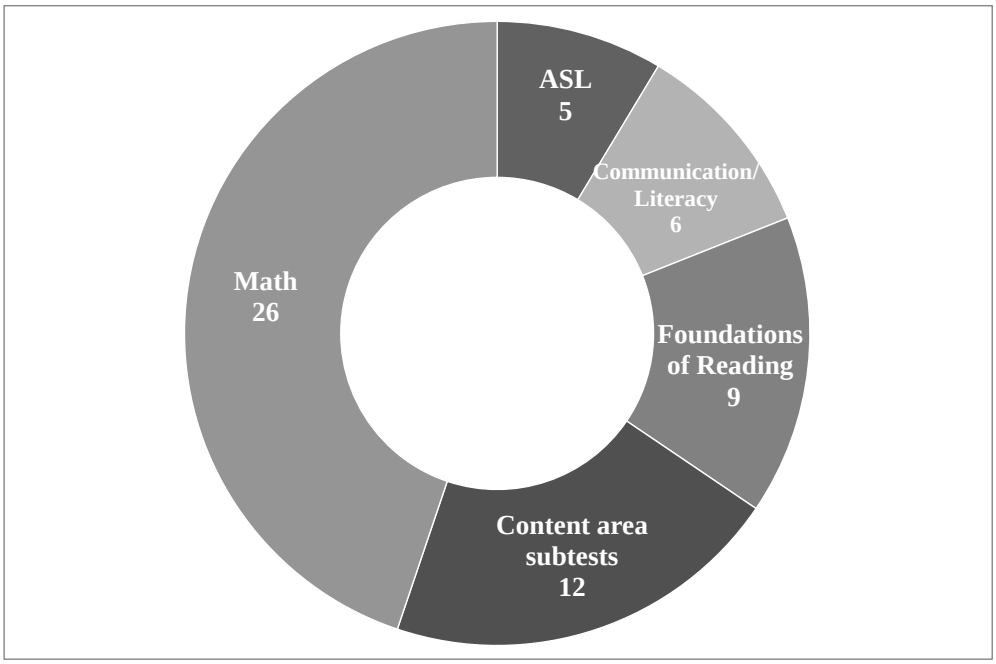


Table 23. ***Challenges with specific MTEL tests***

MTEL tests	Representative in vivo comments
Math	"I struggled with not knowing what was on the MTELs because my training was from out of state. I was able to pass everything on the first try, except for the math, which I had to take three times. The math was for everything from kindergarten to calculus, which was not what my teacher training had prepared me for." "Taking the math subtest under the General Curriculum MTEL was very challenging. I took it 6 times."
Content area	"I went through the NY education system, so some of the history based test content was focused on local Mass history."
Foundations of Reading	"I had to take the Foundations of Reading test three times before I passed but I feel strongly that this was because my program did not adequately prepare me for the exam, especially because how you teach hearing kids to read and how you teach Deaf kids is very different."
Communication Literacy	"Change the MTEL requirement to include more accommodations for Deaf adults to take the literacy and communication test."
American Sign Language	"The biggest problem was that I took the ASLAI in my grad program. It took DESE 8 months to decide if that was satisfactory for a license."

Note: This table is presented in order from the greatest to least MTEL response received.

Concerns about taking the math MTEL received the most attention from survey participants. There are three different MTEL exams with math-specific content (MA DESE, 2017) but few respondents indicated the name of the math MTEL they completed. The in vivo comments in Table 23 were representative of the challenges experienced for each MTEL test.

Maintaining teachers of DHH students in Massachusetts classrooms

"How much longer do you intend to work as a teacher of the deaf/hard of hearing" was asked as a qualitative question, with the intention that, in addition to numeric data responses (e.g., "8 years"), participants would also provide descriptive responses. Nearly 72% of respondents provided a numerical response. Each numerical response was lined up in a continuous variable list and grouping divisions were selected. Table 24 breaks down the numerical responses with associated in vivo comments.

Table 24. ***How much longer do you intend to work as a TODHH?***

Grouped quantitative categories	Number of numeric responses	% of 114 survey completers	% of 95 respondents who provided a quant #	Representative in vivo comments
End of the 2019-2020 school year (or immediate, unspecified time period)	8	7.2%	8.4%	"if I find another opportunity, then I will leave," "I will leave as soon as I can"
1-4 years	11	9.6%	11.5%	"Once I fulfill my TEACH requirements, in three years"
5-10 years	25	21.9%	26.3%	"I want to go back to school to do something else, I just don't know what, yet"
11-15 years	10	8.7%	10.5%	(no comments)
16-20 years	14	12.2%	14.7%	(no comments)
21+ years	14	12.2%	14.7%	"I expect to continue to be a TOD until I retire -- 25+ more years
Lengthy, unspecified time period	19	16.6%	--------	"forever" "as long as I can" "Years – I intend to always work as a teacher of D/HH"

The most concerning aspect of these data is that of the survey respondents who provided an anticipated work-end time-period, nearly 20% indicated they would leave DHH classrooms by 2024, and 46.2% by 2030. The drawback of presenting this as a qualitative question, and not a forced-choice option, is that not every respondent provided a numeric answer, which makes it difficult to predict the future workforce numbers. The polarity of qualitative responses spanned from negative "To be honest, I am looking into starting a new career away from education" to positive, "As long as I can. I really enjoy my job and hope to continue to spread awareness to school communities and families."

"What will be the likely reason that you will leave teaching from a Massachusetts school?" was also asked as an open ended, qualitative question. While this would have been easy to boil down into predictable multiple-choice responses, I felt that leaving the possibilities open to discussion would elicit more rich description of how people feel about this topic. It was predictable that many responses were coded as "retirement;" 40% of the total respondents indicated that they would stay in Massachusetts schools until they retire. Table 25 indicates the themes and representative in vivo comments of additional reasons causing TODHHs to leave teaching in Massachusetts schools.

Table 25. ***Reasons to leave teaching from Massachusetts schools?***

Theme	Reasons to leave teaching – Representative in vivo comments
Career Change (within education)	"To become a team chair or go back to a gen ed class" "Become a principal or special education administrator"
Self/Family-Care	"Children of my own, burnout " "Family responsibilities" "I have seen teachers get older and burn out. If I can't bring joy and a love for children and the work, it will be time to move on."
Moving	"Moving because of husband's job." "My family is in NY and I often think about going back to NY to be closer to them."

Theme	Reasons to leave teaching – Representative in vivo comments
Career Change (an unspecified position)	"Teaching is more work and stress than I expected. In addition, I have developed other personal and professional interests outside education. I want to make a living doing what I truly love." "Finding a different career that I enjoy more."
Money/finances	"Pay rate is extremely low, so I'm working two jobs to be able to pay for all my expenses and student loans." "Salary level, when paired with the number of hours outside of school hours required for adequate planning and preparation is not a sustainable model for a single person with two dependents." "I love Deaf Education and working for the kids, but being in debt is not fun. It's frustrating when you get pressure from admin to get licensed and you are the one paying for tests and tutoring." "A huge issue is when teachers spend $40,000+ per year for a master's program where they hardly make enough to pay it back!"
Negative Statements About Current Position	"If my program closes would be a likely reason that I would leave teaching" "Frustration with administration, lack of resources and support. Lack of respect for the knowledge and experience I bring to my classroom." "School systems don't understand appropriate caseloads for TODs. My role as an itinerant TOD also spreads me thin in terms of travel/direct services/consult time and the enormous amount of time needed for developing materials/assessing student needs and time to consult with student's audiologists." "I know a few people who have left the field because the caseload and demands were too high."

Theme	Reasons to leave teaching – Representative in vivo comments
Negative Statements About Current Position	"One issue related to dissatisfaction of the job may relate to how many 'hats' teachers of the deaf have to wear. For example, a gen ed public school teacher may teach 5 sections of 8th grade math but often in Deaf schools, you teach math for 6, 7, and 8th grade plus a functional/adapted level of math plus an elective such as study seminar plus teaching health class…which makes for more preps per day than the average teacher, on top of all of our students having IEPs/goals compared to gen ed teachers." "Can administrators be required to complete some kind of training to ensure that they understand the needs of DHH students and hire/consult with appropriate professionals?"

Note. The themes in this table are presented in ascending order; from the least (5 comments) to most (32) comments offered by participants.

Recruitment and retention

The opinions of classroom teachers are rarely sought in discussions of problems in education. This teacher shared how the teacher shortage impacted their work: "My caseload is higher this year than in past years because the other teacher of the deaf is out on medical leave and we can't find a replacement. Because of the shortage, any issue that comes up can cause major problems with services."

The following open-ended question was asked, "we are experiencing a teacher of the deaf shortage. What ideas do you have for recruiting people into our field?" Teachers identified areas to recruit students and non-teachers into the field (Table 26), in addition to providing suggestions to retain the TODHHs that are already working, so they will not leave the profession (Table 27).

To recruit adults into becoming a TODHH, the most frequently occurring comments discussed funding, "If all TOD programs were fully funded, I think we would

get more TODs." Specific recurring funding ideas are listed in Table 26. Many participants also indicated the profession needed to be advertised and were candid about their own experiences learning about deaf education as a profession:

- "It is amazing to me the number of people who do not seem to know the job is an actual choice as they are deciding what to do after an undergraduate degree in speech or special ed – marketing!!"
- "I went to Smith as an undergrad and never even knew the MED program existed until I came across it randomly while figuring out what I wanted to do for grad school. Schools don't know this job exists. Parents don't know that this job exists. Pediatricians don't know that this job exists. The field of deaf ed has a PR problem,"

Participants listed creative and actionable ideas to make connections with high school and undergraduate students to get them excited about the profession, and addressed issues related to TODHH teacher training programs.

Table 26. ***Suggestions for recruitment of people into becoming a TODHH***

Themes related to recruitment	Representative in vivo comments
Funding	Loan forgiveness "I want to emphasize how important it was for me that my Deaf Ed grad program was free in exchange for four years of work" Tuition reimbursement; "Offer tuition grants for obtaining licensure" "Awareness of programs that provide grants. Free to almost free education is HUGE" "Free testing for MTELs" "Schools should pay for tutors and MTEL tests"

Themes related to recruitment	Representative in vivo comments
Advertising/cultivating interest in the profession	"Paid advertising through the department of education" Exposure to the profession through "high school career fairs" "Starting to recruit early (i.e., I took ASL in high school and learned about BU's program when I was a senior in high school. I set my goal early to become a TOD)" "Provide hearing people with greater exposure to the Deaf community" (this would be a question to ask Deaf community members how to support this effort)
Making connections	"Schools for the deaf can provide volunteers opportunities to exposed hearing people to the Deaf community, and they can work on ASL skills" "Starting sign language clubs in high schools" "Offering ASL as a world language in high schools" "Having DHH students share their experiences to teachers in entry level education classes" "Visit colleges with education programs to bring knowledge of Deaf Ed as an option to those in general and special education" "Approach undergraduate students in communication disorders that deaf ed is a great option, other than speech pathology or audiology for graduate school" "Reaching out to certified BA-level teachers about getting their master's degree in deaf ed." "Conferences and networking to get people interested in the field"

Themes related to recruitment	Representative in vivo comments
Re-evaluate/ create new TODHH teacher preparation programs	"There needs to be more part-time and flexible TOD graduate programs available for people who are working and can't take time off to attend full-time programs" "A mentorship program for itinerants funded by the state. More professional development provided by the state for itinerants." "In-Deaf-School teacher training" "Offer programs that teachers can specialize in the deaf ed settings they want to work in. For example: deaf ed, deaf ed/special ed, deaf ed mainstream." "Connecting colleges to local schools for the deaf and having the college student gain experience in working with DHH so they become interested." Participants who advocated for *Grow Your Own Educator* models by DHH schools mentioned: "…maybe partnering with a university, to help paraprofessionals and their high school graduates to become TODs" "…reaching out to certified teachers and helping them to get deaf ed licensed." "…recruiting future teachers from the DHH high school" "…allow for work and study flexible programs or online education"

Participants also addressed the shortage by offering suggestions for retaining TODHHs in the field, related to funding, systematic changes, and increasing access to resources for classroom teachers.

Table 27. ***Retention suggestions***

Themes related to retention	Representative in vivo comments
Funding	"Pay/benefits need to be better. Help with student loans. I paid a TON to BU and have gotten little back in a way that helps me pay my loans and not be drowning in debt." "Increase the pay scale at schools for the deaf. I make more than double at the public school where I am currently employed than when I worked at the deaf school in the same state. I would have loved to continue to work at the school for the deaf, but the money and extra expectations (hours, summer school teaching requirement) made it difficult for me to continue working there." "There simply needs to be more money in this field in order for it to be attractive…Deaf education is so individualized that planning each day takes an enormous amount of time. Many of us work long hour well outside of the regular work day and we work a longer school year, while our peers in public schools make tens of thousands more per year, and work fewer hours."
Systematic changes	"Change the delivery system of services for students in the mainstream in this state. Have the TODs work for the state, not for collaboratives." "More flexibility between states in terms of transferring certification." "Change from an 11 month to 10 month program for teachers (no one wants to work in July)" "Can administrators be required to complete some kind of training to ensure that they understand the needs of DHH students?" "Maybe if Deaf Ed programs were more available, or more affordable, it would help with the shortage."

Themes related to retention	Representative in vivo comments
Increasing access to resources	"Mentorship program for itinerants funded by the state. More professional development provided by the state." "Mentoring opportunities for new teachers." "How do we learn about current research? And current and up to date teacher training materials?" "Networking with other TODs. What kind of support do we have to help each other?" "Teachers need to be prepared and supported to work with deaf students with disabilities. It is becoming more and more common for deaf students to have additional disabilities and the number of teachers who are trained to work with that population is lacking." "Give them more support at work. Structure school staffing so that teachers don't have to do the job of 5 people at once. Less meetings, less paperwork…more time to prepare GOOD teaching." "I know a few people who have left the field because the caseload and demands were too high. Finding a way to bring these people back and supporting them should be a priority."

Qualitative Analysis – Interviews

Survey data informed the questions asked during the teacher interviews. Demographics of the seven interview participants are described in Table 28. The same inter-rater reliability process was followed as the qualitative survey analysis. Thematic analysis was conducted and addressed the research questions.

Participant Characteristics

Using the maximal variation sampling process described in Chapter 3, participants were selected from each demographic category: employment type (early childhood/ elementary/secondary/itinerant), participant's deafness status (deaf/hard of hearing/hearing) and language of instruction (American Sign Language/spoken language)

(as outlined in Table 8). Initially the intention was to interview six participants. However, when I reached the last participant, who was supposed to be deaf, a hearing teacher had mistakenly indicated they were deaf, which was not realized until the interview began. As such, seven participants were selected, who were all female. Five hearing teachers represented all four employment types and both languages of instruction. A deaf teacher and a hard of hearing teacher were randomly selected, which provided additional information on their experiences within their specific employment type. Table 28 describes characteristics of the participants interviewed. Pseudonyms were assigned to each participant

Teachers interviewed were employed across six different Massachusetts counties, including inner city, suburban, and rural settings. Interview participants were currently employed in all of the Massachusetts private schools for the deaf, as well as several public-school settings. In addition, two teachers had experience of working at two different Massachusetts schools for the deaf (where different interview participants were currently employed) and described their work in both settings. Wendy, an itinerant teacher, reported on the survey that she taught using spoken English however, the interview revealed that she also works with students who use ASL within a self-contained collaborative program. All teachers had graduate degrees from private universities, located in the northeast or mid-Atlantic regions. Two teachers of DHH students had a master's degree in an area outside deaf education (e.g., majors in special education or counseling). Of the five teachers who attended deaf education teacher preparation

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Table 28. ***Interview Participant Characteristics***

Pseudonym	Employment Type	Deafness Status	Language of Instruction	Years teaching DHH	Massachusetts licensure	Employed by
Mary[c]	Secondary	Deaf	ASL	31	• Elementary, K-8 • Children w/ Special Needs: Audition • Special Needs	Private deaf school
Rose[a]	Elementary	Hearing	ASL	20	• Deaf and Hard-of-Hearing, All levels • Early Childhood: Students with and without Disabilities, PreK-2	Public school
Eve[a]	Secondary	Hearing	ASL	15	• Deaf and Hard-of-Hearing, All levels • Elementary, 1-6	Private deaf school
Sue[b]	Itinerant	Hearing	Spoken English	14	• Deaf and Hard-of-Hearing, All levels • Early Childhood: Students with and without Disabilities, PreK-2	Private deaf school
Wendy[a]	Itinerant	Hard of Hearing	Spoken English/ASL	12	• Deaf and Hard-of-Hearing - [ASL/TC] [provisional]	Collaborative
Ann[c]	Early Childhood	Hearing	ASL	8	• Moderate Disabilities, PreK-8 • Early Childhood: Students with and without Disabilities, PreK-2	Private deaf school
Holly[b]	Secondary	Hearing	ASL	7	• Elementary, 1-6 • Deaf and Hard-of-Hearing, All levels • Moderate Disabilities, PreK-8	Private deaf school

Note. Deaf education graduate program – current status: [a]open, [b]closed; [c]non-deaf-ed master's degree.

programs, two of those programs have since closed (see Table 12).

The current licenses of all interviewed teachers are listed in Table 28 (confirmed by publicly available data) and represent a variety of licenses held, in addition to the *Deaf and Hard-of-Hearing* license. Only one TODHH, Wendy, has licensure which specifically identifies the language of instruction [ASL/TC].

Regarding funding to become a TODHH, only Sue indicated that she received funding which paid for her master's degree. When asked if she would have become a teacher without this funding, she replied, "No. I didn't know anyone with hearing loss. I knew nothing about this job." Rose was the only teacher who reported that she benefitted from a "$17,500 loan forgiveness because I worked in a Title 1 school working with deaf kids that forgave the type of loan I had. [My principal] worked super hard on that." At the time of the interview, all teachers indicated that they had no intention of leaving the deaf education profession.

Inter-Rater Reliability

Interview transcripts were read and initial codes were created. These initial codes were shared with the second coder (the same person who coded this study's qualitative survey data), and the same protocol process was followed (Appendix C). Both coded each interview in NVivo 12. Additional nodes could be and were created by the coders during the coding process. Table 29 indicates the IRR percent agreement for each interview by overarching parent nodes. Initial disagreements were due to errors in coding, overlooked codes, or added codes by one of the coders. Disagreements were resolved by discussion.

Table 29. ***Inter-Rater Reliability–percent agreement for each interview by parent node***

Parent node	Holly	Ann	Rose	Sue	Wendy	Mary	Eve
Love about job	99%	96%	97%	93%	97%	92%	99%
Job challenges	82%	95%	84%	83%	84%	78%	77%
Keeping teachers in the classroom	88%	96%	95%	93%	98%	94%	96%
Pipeline	96%	88%	96%	89%	97%	95%	91%
Licensure	99%	95%	95%	96%	97%	100%	94%
Other issues	60%	90%	74%	92%	88%	97%	83%

Interview themes

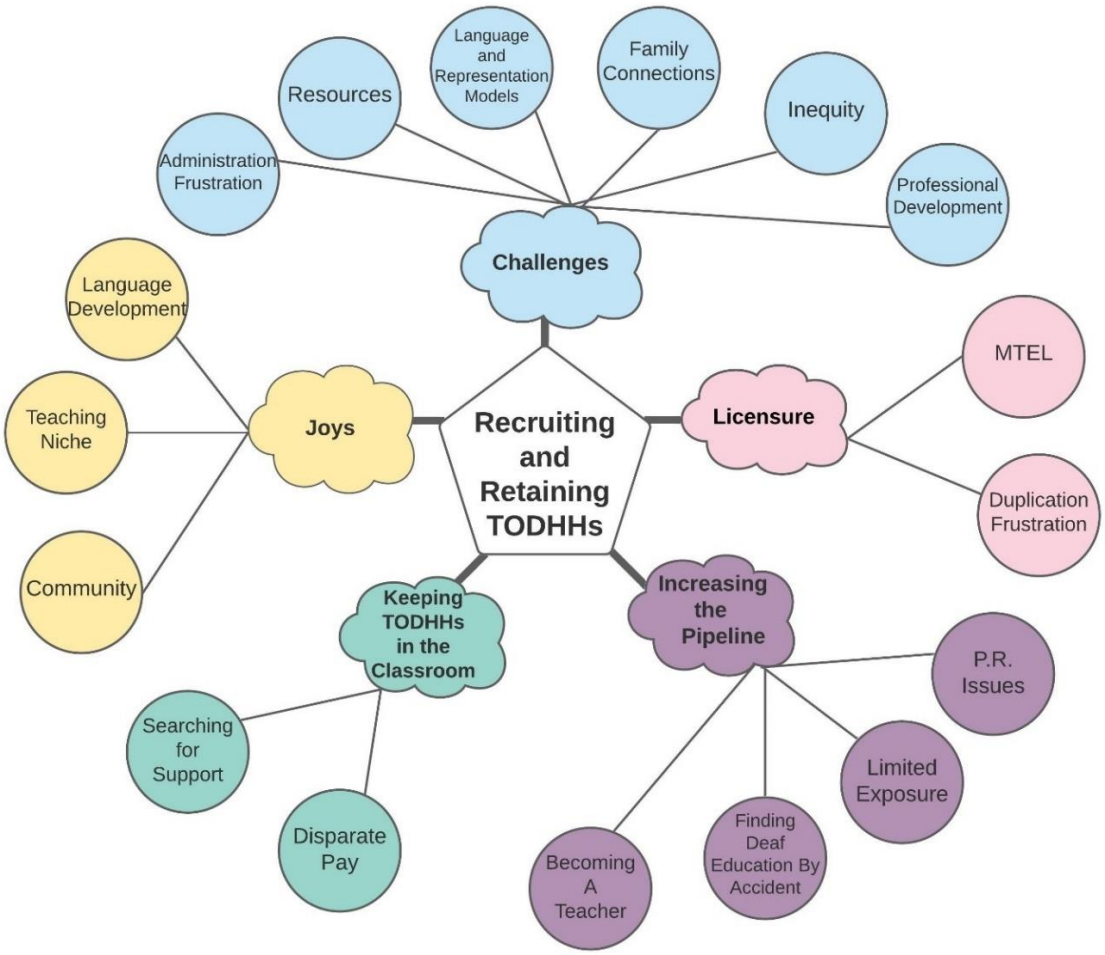
Codes from the interviews were organized into the following themes, which address the research questions: Joys, Challenges, Licensure, Keeping Teachers in the Classroom, and Teacher Pipeline. Figure 7 outlines these thematic codes and their respective sub-themes.

Joys

When asked what they enjoyed about their work, these teachers smiled and their faces brightened when talking about their students and how much they loved their jobs. Wendy exclaimed "I love my kids (LAUGHS). I really love being with my kids and, Oh God, I have tears, Kym. I didn't think that was gonna come." Rose told a story how she was excited to go to work everyday:

> There wasn't a moment that I woke up and went into work that I wasn't excited to go to work. I'm talking I was nine months pregnant and I was still excited to go to work. Working with these kids, you can see such growth day to day. Then longitudinally you get to teach kids for two years when you're looping two years. It's amazing – you're then teaching different kids.

Figure 7. ***Interview themes and sub-themes***



Holly enthusiastically described her love of teaching:

> I think the biggest thing is always that *aha* moment. Like it never gets old, no matter what, it never gets old. When you have a student, who is struggling and all of a sudden, they get it, it's just awesome. (GIGGLING) It's really awesome.

The sub-themes identified by these teachers' comments include *teaching niche, language development, and community*.

Teaching niche describes the love each teacher expressed for the group of students they currently teach. Teachers interviewed represented classrooms of students

who were preschool through high school, as well as itinerant providers who travelled between schools. Some teachers worked on academics with the goal being students who would graduate with a diploma. Other teachers worked with what they termed "deaf plus" (i.e., deaf with other disabilities), which addressed functional skill development. Every teacher mentioned satisfaction with some aspect of their employment and that they enjoyed teaching their ages/levels of students. Table 30 identifies teacher comments that describe what they enjoy about their job.

Teachers interviewed demonstrated their understanding that *teaching language* to DHH students was their responsibility as outlined in the CED-CEC standards (Council for Exceptional Children, 2018a). When discussing language acquisition for DHH children, Rose enthusiastically replied:

> My jam is absolutely language development. Part of the reason that I love working with super young deaf children is that amount of growth that you can see in their cognition and language development is insane. And it is so…inspiring, day after day. When deaf children have language development, you give them access to humanity and the world. Once you have language you can go forward and be part of society.

Table 31 identifies responses provided regarding experiences with teaching language.

These teachers also wove the importance of their school *community* into conversations as described in Table 32. Participants described the community that was important them, whether they referred to their fellow teachers, their students, parents, the Deaf community, or all of these.

Table 30. ***Participants enjoy the job they have***

	Representative in vivo comments
Ann hearing early childhood SPED licensed	I really do love being in a deaf ed classroom. Right now I am a preschool teacher and I absolutely love it.
Wendy hard of hearing itinerant	I love being an itinerant. I don't really like being in one classroom all day. I like moving around and I like being with kids of different ages here and there throughout the day. So, I can be playing on the floor with one kid and then later be doing reading with someone in the seventh grade. So, I like that variety in my day. And I like seeing different people and moving around. That's my personality.
Sue hearing itinerant	I like being able to follow students over the years.
Mary Deaf secondary	My favorite group to work with is middle schoolers.
Holly hearing secondary	They are never boring! On a whole, I prefer working with kids who are deaf plus. I'm much more interested in deaf plus special needs and developing their communication in any way possible. I just feel like they're fun.
Eve hearing secondary	I love (that I work in) a BiBi program using ASL. that was something that I felt very strongly about. And one of the reasons why I wanted to work there in the first place.

Table 31. ***Teaching language***

	Teaching Language – Representative in vivo comments
Holly hearing secondary	I just love being able to teach through ASL. being able to teach certain things, because it's easier to teach it in a visual way. So, it's kind of cool sometimes being able to explain something in ASL that might be very different and boring when it's just drawn.

	Teaching Language – Representative in vivo comments
Rose hearing elementary	I've had conversations with three year olds about presidential candidates in ASL. I literally had a talk with a three year old about why I had voted for Bernie Sanders. He asked me who I voted for. I spelled out Bernie Sanders and I said you know and I started to say you know the man he was and he said, “The man is bad,” and I'm like, “No no, not that man. That's a different person.” So his parents had a conversation with him about who Trump was. He was able to tell me, “Oh my mother voted for the man with the curly white hair. But my dad voted for the woman and nobody wants the man to be president,” and I'm sitting there and thinking to myself “this is a three year old.” Phenomenal. I love this.
Mary Deaf secondary	My goal is to express themselves through language, instead of having a meltdown or communicating through behavior.
Sue hearing itinerant	I like being able to follow students over the years. You have a connection with the student and with the family and there's trust. You see their language grow. And as kids enter adolescence, I can tell them things and, they might roll their eyes at me, but they also trust me and they know that I have their best interest, even if I'm telling them to do something they don't want to do. I love the college transition. I had two kids last year that I started with in preschool and they both graduated, and it was awesome to like send them off to college.
Ann hearing early childhood SPED licensed	I think having a deaf adult (in my classroom) has not only supported me as a teacher but supported my students as a deaf role model. I think that that's really important. And I mean I can't teach them how to do that from a deaf perspective. But having that person -- teaching them grammar or teaching them how to tell a story and like I'm at awe because watching people who are deaf, sign stories it's amazing and how you can tell one story in 18 different ways or more

Table 32. ***Participants enjoy their school community***

	Representative in vivo comments
Holly hearing secondary	I teach deaf plus, deaf students with special needs. The teamwork that staff had there, and the comradery and the sense of community that the school created was phenomenal.
Ann hearing early childhood SPED licensed	Being in a classroom, I've always had a deaf staff with me. So, that really has helped my sign language skills. And then going to students' houses, some of their parents are deaf, so I think being there and learning I think has only helped my fluency. Being part of that deaf culture and being immersed in it is just really exciting for me.
Eve hearing secondary	The community is a huge thing for me. I mean, obviously, I'm not naive. I know it's not perfect. But nowhere is going to be perfect either. So, when something happens that I don't agree with or upsets or angers me, something's going to happen in another school any way too. But in general, it's the community of people, the support, the open mindedness. Especially, as someone who is very involved with the LGBTQ community within the school too. That's always been something supported by the school as well.
Sue hearing itinerant	There's a lot of schools I like to work in, in Southern New Hampshire. I've met a lot of runners and triathletes in the high school there in particular. And so, I do spend more time there socially, because I like that community a whole lot.

Challenges

Teachers were asked an open-ended question about the challenges they face in their work. Several teachers read their responses from notes they had written before we met. This question elicited long, expository answers, particularly when situations were out of their control on topics they were passionate about. Sub-themes identified by these teachers' comments include *administration frustration, resources, language and representation models, family connections with their children, inequity,* and *professional development.*

Teacher comments describing each Challenge sub-theme are included in tables below. Teachers expressed *administration frustration* about supervisors, school policies, or their unique DHH role/expertise not being understood by other school professionals (Table 33). Participants described needing to fight for *resources*, which might be typical for any teacher, such as classroom space and materials. However, these teachers also addressed the lack of resources needed specific to DHH learners, with and without disabilities (Table 34). These teachers also expressed concern about their students not having *language and representation models*, such as receiving instruction from teachers who were Deaf and native ASL users as well as the need for BIPOC teachers who mirror the representation of the students they teach (Table 35). Teachers indicated *family connections with their children* concerns for their DHH students who did not always have ease of communication or connections with their families (Table 36). Teachers also passionately discussed *inequity*, how poverty and racial segregation impacts the education of their DHH students (Table 37). *Professional development* specific to deaf education was one of the 10 most dissatisfied responses on the survey. As professional development is required for learning to implement the latest research and techniques, in addition to maintaining current licensure, an interview question specifically probed for more information related to their satisfaction and concerns with the DHH professional development currently available (Table 38).

Table 33. ***Frustration with administration/other professionals***

	Frustration – Representative in vivo comments
Mary Deaf secondary	These days it depends on who's in charge of the school. If they [the administration is] respectful of teachers. Like right now, we have that. But back in the day [with previous administrations in this school], it was very different time. Through the years, [my school] wasn't always an easy place to work. A long time ago, as a deaf woman, at the time my para [paraprofessional/teacher's aide] was hearing and a man. I once asked for something and was told no, I couldn't get it. But then my para, who was a hearing man, asked the same question. And he got it, they said yes to him. This is a long time ago. But I was really angry about that but then I said to my para, I'm going to use you. I'll tell you what to ask for and we'll get it. The current administration isn't like that now though. Really, these days, it's so much better than it was before.
Holly hearing secondary	When we had big donors coming in, the principal sent emails that basically said, please hide all your behavior students, don't let them in the hallways. And that doesn't make you feel good about what you're doing, if your school principal is ashamed of the population, you're working with. Like the idea of needing to present this ideal, perfect school that does everything right to bring in donors, there's something wrong with that. I think it should be the opposite. Like look where we're struggling. If we had X, Y, Z, then we could do these amazing things for this population.
Wendy hard of hearing itinerant	Anywhere in public schools, administration doesn't really understand deaf ed and what does it means to follow the (BiBi and oral) philosophies. They [school administrators] tell me I need to put it together, to do both. And, I'm like "I don't know how that works." And they were like "yeah, it works, you can do that." And I'm like, "you need to tell me how then."
Eve hearing secondary	It would be nice to have an administration that has consistency….teachers at different grade levels are evaluated differently. I remember there was something I paid for my classroom. Then later, I found out another teacher, you know, got a similar thing and the school paid for it. I was like...[annoyed face]. My fault, I didn't ask, you know. I missed out on opportunities because of assuming or not saying something or asking. But at the same time, that wouldn't necessarily be an issue, if they were consistent. Communicating, 'this is what we cover, this is what we don't cover,' kind of thing. I'm trying to be more assertive.

	Frustration – Representative in vivo comments
Sue hearing itinerant	When I'm in schools, nobody knows what I do. And I explain my role all the time. I'm written as every other thing in the grid: the audiologist, a special ed teacher, the one on one support and I'm like, "no, teacher of the deaf." And it's nobody knows what it is. Everyone at least has heard of a PT and they know it's something to do with movement. They've heard about OT and they know it has something to do with writing. They've heard of an SLP, they know it has something to do with talking. But nobody knows what a teacher of the deaf is. A SPED teacher wrote an objective that said "student will learn to hear" by whatever the date was. Well, I can't do that. It was a challenge working with the SPED team to help them understand why that wasn't a reasonable objective. When you write that, what are you thinking? Would you write that a blind child will learn to see? It's frightening that there are special educators writing those, right?

Table 34. ***Concerns about resources***

	Resource concerns – Representative in vivo comments
Holly hearing secondary	So these are probably things you've heard from every single person, lack of resources that address deaf learners across the board. As an English teacher, that's my focus. I also think there needs to be more trainings on the social, emotional piece of working with deaf kids and what their experience brings to the classroom. We cannot even begin to understand what they go through at home.
Mary Deaf secondary	We're always looking for a better curriculum, for working with deaf kids. We use the Bedrock Curriculum which is a really good program. But we need more training on it. I really would like [the curriculum creators] to come and be involved with us with more training on their curriculum, not just one day or two days, but really an in-depth training. That would be amazing. It would be interesting to learn how they could adapt the curriculum to work for special ed deaf kids. I think they are working with a limited number, two or three teachers at my school now. I didn't get to be involved, though, darn.

	Resource concerns – Representative in vivo comments
Sue hearing itinerant	Space used to be an issue, but it's not anymore because I decided I wasn't working in hallways any longer. And so one of the things I say, when I come in is "I'm going to need a room," and when I'm told there is no space, I'd say, "Well, I'm going to be here on this day at this time, and I'm going to need a room," and it's not really presented as an option. And I was surprised that nobody really questioned it. I would tell them, "this is what I need, figure it out. You've figured it out for every single other person in this building." It's not always like a gorgeous space, but it's a quiet room with a door that closes. And most of the time, if it's a shared space, my name will be on the door with my days and times, and I'm no longer fighting for a space. It took me just realizing that my job is just as important as every other teacher and my student is just as important as every other student.
Eve hearing secondary	Space is a huge ongoing issue and I know it's not just me. Our department has grown quite a bit over the years. We have these tiny little classrooms and I used to joke and call my classroom the shoe box. This school year I got a new classroom. I was thrilled. It's huge. Well, it's not really that huge. But for me it's huge compared to my old classroom. At one point, my supervisor wanted to put a seventh student in my classroom. Now, seven is not a big number. Public schools, hearing schools they've got you know, 20-30 kids. And you know, they're like 'seven, you're complaining about seven?'. Literally I have nowhere to put an extra chair. Then, as your numbers go up, you're required, because of ratios, you have to have an aide in the classroom. That's another body in the classroom, you know. It's really tough. And sometimes you want to do a project and you want to be able to just leave it out on a table. And you just can't. I see what other schools have and think, "oh I wish we had that." Especially now that I teach life skills – another school for the deaf had a mock house. I would love that! Now, I have access to things – a washer and dryer, kitchen. But, I always have to book it in advance. It's not in my building. I have to talk to somebody else, to find out if it's available. But, if one of my students is absent, who was like the key point of this specific activity. Now, I don't want to do that activity on that day. It's a pain to reschedule. I would love to have a space within a building or even a house. If we had a house, I could drop the cooking lesson and focus on something else, being able to teach several things at once.

Table 35. ***Language and representation model concerns***

	Representative in vivo comments
Ann hearing early childhood SPED licensed	my biggest challenges honestly is because I have children who are deaf plus, it becomes challenging because they're so young and they have not had access to concrete language from birth that they come with no languages. They come with mostly just behaviors that they are portrayed negatively because they haven't been able to communicate their needs for three years.
Rose hearing elementary	There isn't a single child that I teach that has typically developing language and I can't imagine how that's ever gonna change because where are their pure language models? They have none. We need more deaf people. I just wish that we could figure out a way to make that happen because these children need deaf role models. So I'm teaching all people of color. And there's one teacher of color on the elementary team. We're all women. And none of us is deaf. So. It's impossible for us to try as we do very hard to be culturally sensitive and responsive. I'm not black and I didn't grow up black and I'm not deaf and grew up deaf. So, it's very difficult for me to try my best out of that situation. I am a good teacher and I'm a caring and empathetic teacher but I'm not black and I'm not deaf.
Wendy hard of hearing itinerant	So, I didn't have a real deaf or hard of hearing role model when I was growing up. And I love being able to do that for my kids because it's something we need. We need to be able to see the kind of adult that they'll grow up to be.
Mary Deaf secondary	When I was in high school, I met a teacher who was hard of hearing herself and I thought – Wow, you can be a teacher and be successful and be hard of hearing? That was pretty amazing. She was so nice. In ninth grade - I told all my teachers when we watched movies, that I didn't understand the movies. This teacher was the only one who got it. She gave me the transcript so I could read it. I was like, oh my gosh! That teacher was so sweet and caring. That impacted me. I was like, wow…I definitely want to be a teacher just like that.

Table 36. ***Family connection concerns***

	Representative in vivo comments
Holly hearing secondary	From what I can see in the high school kids, the kids who have strong family connections have more investment, they care more. I got my first look at what it's like to be deaf in a hearing households through one of my former students, now grown, his mother set up a zoom birthday party for him. I watched, as family talked around him. They got a student to try to interpret, but he was doing a lousy job and he wasn't interpreting everything. And people were all talking over each other. All of that normal stuff that we learn about. But watching his face as all these family members talked around him and then watching his face light up when one of his former classmates showed up. And they could have a quick little sign conversation – parents need more education that it happens. Like even as a teacher of the deaf, you kind of know it happens, but you don't feel the heart of it until you see that.
Rose hearing elementary	[At my previous school] parents who were economically challenged and there was so much on their plate that [learning to sign; learning to communicate] just wasn't something that would fit on a plate. And it was generally with a heavy dose of guilt that they were uninvolved and they were often on home visits, apologize and be embarrassed and said, “I keep trying but I don't have time.” Where I work now [urban school], none of the families that I work with can communicate with their children. All of the parents work multiple jobs. None of the parents speak English. The barriers are so great. Here we have like 10% parent attendance when we have a family event.
Sue hearing itinerant	(A student I’m worried about) whose family refuses to allow any kind of psych testing even though we all know this isn't hearing loss. There's something going on that is not OK. And we're worried about the kid and the parents are like, “no, it's hearing loss because he can't hear.” And it’s really not though.

Table 37. ***Inequity concerns***

	Inequity Concerns – Representative in vivo comments
Rose hearing elementary	I did my internship at [this urban school]- pre practicum and it wasn't as segregated as it is now. I was shocked. There are only a couple of white children in the whole school. That's racial segregation that is state sponsored systemic racism. SPEAKER 1: So why do you think that is? SPEAKER 2: The white people move! They take one look at [the old facilities] where we're working at and they're like, "Oh I can afford to move, I have the means, I have a job, I have"… it's a 100% systemic racism supporting this whole situation. It's the inner city kids whose parents don't speak English and can't afford to move. Almost every single child lives in subsidized housing in my class. I mean, where are they gonna go?They're not moving to [the suburbs, where the previous school is located]. And do they even know, have they even had the ability to go see the [suburban school]? Half of them can't come into school. Most families don't have cars. If these kids did do something like go to [previous school], these would be the parents that we would not have contact with. So, this would be, you know, of my teaching experience like when I used to have family events at [suburban school] I would get 75% or higher attendance. And we would sometimes drive and pick somebody up who couldn't get there. Here we have like 10% when we have a family event. We have literacy events and things. 15% maybe? No way. It's just a totally different set of challenges and it's definitely racist. It is very upsetting to think about because I just didn't realize. I didn't work here so I didn't know. It's like a joke when administration tours a family through the school. Most of the time, someone will make some kind of a crack like, "Oh we're not getting them. They'll move to go to the [suburban school]." We have the cast off children or children whose parents just don't know better. But that maybe it's not good to know that every child in your kid's class can't read, and that there's another school where the kids can read. Why can't these inner city kids go to a more central location? Not only would it benefit these children, but would also benefit schools (with a predominately Caucasian population) and these children bring with them a wealth of awesomeness. I've learned more about Guatemala this year than in my while life. And I'm learning it from these little kids who are finally getting enough language to tell me cool things, like the birds of Guatemala.

	Inequity Concerns – Representative in vivo comments
Sue hearing itinerant	I have a lot of families where English is not their first language. It's a lot of work on my own figuring out how to best support students who are not native English speakers or things that have nothing to do with hearing loss, like poverty resources. I have some really poor kids and homeless families, and nobody cares about the hearing aids, They care about are we going to eat and so when the hearing aids are lost, and mom is like, 'I don't know where they are, it's not important.' Helping families access other resources so we actually then can care about putting hearing aids on. There's not a lot out there that talks about like homelessness and hearing loss. And so, it's figuring it out individually with the families and working with them that way because I can't do my job unless those other basic needs are met first.

Table 38. ***Professional Development concerns***

	PD Concerns – Representative in vivo comments
Holly hearing secondary	I think more attention needs to be paid to deaf plus kids because learning and teaching techniques for general special ed kids are not necessarily compatible due to the language differences…I'm learning how to figure out the language piece. How do you teach a student who is deaf blind? Or deaf blind with other disabilities? There's not a lot of stuff out there, and there are a lot more students that are deaf plus than we realize.
Rose hearing elementary	I attended the National American Sign Language Early Childhood Consortium maybe 8 times? It brings together deaf early childhood education researchers, which was incredibly valuable. There's also the National Deaf Education Conference, but I haven't gone so I don't know if people find it worthwhile. If there's one national conference in your profession, that's a little slim comparatively to other professions. The offerings are not incredibly robust but I guess my rating (about PD available specific to DHH students) would be 'could be worse.'

	PD Concerns – Representative in vivo comments
Wendy hard of hearing itinerant	When it comes to PD, none of my places of employment have ever provided PD that's specific to deaf and hard of hearing kids. CID has some online trainings, so I've done those. I have to look for it myself. It's word of mouth and searching. It's not like DESE sends me an email "here's all the PD for deaf and hard of hearing students this year." (LAUGHS)
Sue hearing itinerant	I get very minimal professional development. My school (for the deaf) offers PD, but it's really not accessible to the itinerants, because it's at times that work for the school staff, but don't work for us. We can't cancel kids for a day. Or it just may not be applicable – something like mindfulness in the classroom. That's fine, I'm not critiquing it, but that's not going to help me in my job.
Eve hearing secondary	I would be all excited to attend this math workshop. They'd be teaching something, and it would be so hearing based – a math program that is based on singing songs doesn't help me. That's just an example. I found this website Professional Development Institute, developed for hearing students, but has good content. It's all online and they have a Flex program where you can take up to a year to complete it. Or, if you want to sign up for the summer when you have off and just plough through it, you can. They have a lot of really neat tech related courses. I got my Google Classroom tech certificate from them. When remote learning started, it was no big deal because I already knew it. That being said, it is tough to find workshops, outside of school, that are specifically related to the deaf. Then, on top of that, it also has to apply to what I do. If it's a deaf workshop for preschool kids, that doesn't help me (LAUGHING).

	PD Concerns – Representative in vivo comments
Ann hearing early childhood SPED licensed	I appreciate the professional development that is provided to us at my school. We have a morning training time before school starts – we have something every day. Some days it's a prep time so it's not structured professional development. Most other days, it's either it's all related to the school so it's not always related to deaf education. There has been a variety of models they have used over the years of how much professional development has been given. We're now moving back to a structured professional development model just so teachers don't have to go outside of the school as much to get the professional development points that they need.
Mary Deaf secondary	I have problems finding things that are connected to the deaf students that I work with, but I can adapt the materials. I've had trouble getting interpreters for PD (that wasn't specifically for deaf students). At Lesley College, I had vouchers for a free class because I supervise their students. So I told them I want to take this class and I needed an interpreter. They argued with me -- this was a long time ago – and said 'we're not going to do that.' It was too hard to fight, so I gave the voucher to somebody else. I supervised another student, I got a second voucher. And I tried again. It was one year going back and forth and back and forth about them providing an interpreter for that class. I documented everything and I said, 'Okay, I've documented what we've discussed. Are you ready to put it in writing that you're not going to provide an interpreter? Are you ready to write that?' Oh no, then I got an interpreter. So after that, there was no problem getting interpreters. Sometimes, my director will tell me, 'you need to go to this specific workshop.' Okay, but this workshop is next week. I can't find an interpreter for next week…I can't go! Well, you should go. But how am I going to go they won't have an interpreter there by next week?? It's a good idea, but I need access. Now things are better. MAAPS [MA Association of 766 Approved Private Schools] supports professional development for teachers online through Westfield State College. So I took a mentoring class. And I asked whether the classes were accessible and was told, yes, I said, there was no interpreters but they had captions. So, it's easier now, taking PD classes at Westfield State through MAAPS.

	PD Concerns – Representative in vivo comments
Mary Deaf secondary	The Learning Center offers training, which has been awesome. But it's hard for me to drive all the way to Framingham. I enjoy going there, because it's 100% accessible, the presenters use ASL or there's an interpreter. It's just great. It's like, I, I just get to go and just really sit back, relax, and learn and. But, Framingham can be tough to get to. The topics were great, but's that's the only PD offered specifically for deaf students. Another time I went to a Concord, NH. They offered a three day weekend workshop on math, for deaf students. That was really cool. And then that presenter came to our school to meet with us. But the drive all the way up there to Concord was really far. It was snowing I remember driving all the way to New Hampshire and we slid on the road. And, aahhh! But it was a great workshop. It's rarely rare to find Deaf education workshops.

Licensure

It is no secret that educator licensure requirements specific to Massachusetts can be challenging to some teacher candidates. During the interviews, teachers talked openly about anxiety surrounding the licensure process. The specific areas of concern included studying for and passing the *MTEL* licensure exams and *duplication frustration*.

Teachers' licensure comments are summarized in the tables that follow. Passing MTEL exams is a requirement to become licensed as a Massachusetts teacher. *MTEL concerns* were expressed by the participants who did not initially pass MTEL exams, but also noted by teachers who passed, in solidarity of other teachers (Table 39). *Duplication frustration* was described by two teachers who came to Massachusetts from other states who reported their concerns of reduplicating the testing process and additional frustration that license reciprocity was not recognized (Table 40).

Table 39. ***MTEL concerns***

	MTEL Concerns – Representative in vivo comments
Holly hearing secondary	The hardest part for me was actually the social studies licensure test, because we learned about the New York state native Americans [in my grad program]. This MTEL required me to know about Massachusetts state native Americans. I know that sounds silly, but that was literally the thing I had to study hardest for, was because our states had different historical knowledge. It felt stupid that it had to be so specific to the state, because you could pick up from a textbook when you were teaching. You didn't have to know it.
Ann hearing early childhood SPED licensed	I didn't pass the MTELs the first time, no. My early childhood I had to take two of the MTELs up to I think the fourth time I passed them both. So it was a challenge for me. I did some prep courses and ended up passing.
Wendy hard of hearing itinerant	It's really hard in Massachusetts. And then you have to take a math MTEL, and then you have to go and take a certain math class in order to pass it. It took a few times for me to pass. I emailed them recently because I keep hearing about the SEI class that everyone has to take for English language learners. I keep asking if I have to take that? No one had an answer. Finally I got an email from DESE documenting that I don't have to take it for my license. It's so confusing.
Sue hearing itinerant	I'm not a good test taker, but I didn't find any of them particularly hard. The language one, I can understand why it would have been hard, but [linguistics professor], who I didn't understand a lot of what he said in the moment, but after reflecting on it, everything he said was basically on the MTEL.

	MTEL Concerns – Representative in vivo comments
Eve hearing elementary	Getting certified, fortunately, for me was easy. When I was at Wheelock, taking the MTEL was part of the graduation requirement. You could not graduate if you did not get your license. So I took the MTEL. In fact, I inquired about that, because at the time I wasn't sure if I planned on staying in Massachusetts. I had said, you know, could I take the Praxis because that at least applies to a variety of states. And no, it had to be the MTEL.
Mary Deaf secondary	I was lucky. At that time, I didn't need to take any MTELs. I was grandfathered in, so I was lucky.

Table 40. ***Duplication frustration***

	Representative in vivo comments
Holly hearing secondary	The requirements of the Massachusetts social studies test were frustrating. Because I went to New York state schools and grew up in New York. All of my education and background information was based on New York's system. And when I came to Massachusetts, it was a pain in the butt that there was no reciprocity for certification.
Wendy hard of hearing itinerant	So, I fulfilled all the requirements to become a teacher in Maryland, and then New Hampshire accepted it too, there was no problem. Then when I moved from New Hampshire to Massachusetts, DESE told me, nope, we don't want your Praxis score, you have to take these MTELs. For the ASL test, I originally took the ASLPI in Maryland. And New Hampshire was ok with that too. Then when I moved to Massachusetts, they told me I had to take the SLPI. There's a certain individual you have to meet to do the test with. I worked on that for a year to meet the person to take the test with. And I passed it.
Mary Deaf secondary	If they're already licensed in another state. They should be able to transition that that licensure to here from any other state. That's really wrong.

Keeping Teachers in the Classroom

Participants were asked for their ideas to keep teachers in deaf education classrooms, as opposed to moving to different schools, or leaving the profession completely. Responses to this question fell into two sub-themes: *searching for support* and *disparate pay issues*.

The ideas described by these participants for keeping teachers in deaf education classrooms are outlined in the tables that follow. Teachers discussed *searching for support* needs from a variety of perspectives, including peer support and networking, administration understanding what teachers need, and finding support to be effective in the classroom (Table 41). Teachers who were employed by private schools for the deaf identified *disparate pay issues* as the reasons that colleagues left their schools to work in public schools with deaf education programs or left teaching deaf students completely and taught hearing students (Table 42).

Table 41. *Searching for Support*

	Searching for Support – Representative in vivo comments
Holly hearing secondary	We need better networking, better support for each other. It has to be forced support. It's hard to reach out to someone who is in the field. You have to just be allowed to vent and complain to build that support. It has to be…this year, this x number of teachers from surrounding schools are getting together to discuss…it has to be part of the school's professional development. And it doesn't have to necessarily be part an educational workshop. One of my friends who was in special ed did that. The teachers get together and host their own workshops, where you go in as a special education teacher and just bounce ideas off each other. It would be really cool to have that for deaf ed.

	Searching for Support – Representative in vivo comments
Holly hearing secondary	Administration in general needs better training on trust of their teachers. Micro-managing to make your school look good does not make your school function well. Teachers are not feeling supported by their higher ups and almost given these feelings of shame about the (deaf plus) kids they're working with. Why would you be proud to work in that environment? Then you get burned out because there's lack of teachers and lack of resources, and you're taxing your brain. You're taxing your emotions and you hear stories about the lives these kids go through at home. It's just too much to shoulder when you're left alone.
Ann hearing early childhood SPED licensed	I think of the experiences I had with co-workers who have come to the school, and then left. The way our school is set up, it's deaf plus, and I don't think a lot of teachers who just have a teacher of the deaf degree are well enough equipped to teach in a deaf plus setting. If you're not prepared for a classroom where a student has serious behaviors, or other ways to communicate, it's harder. That's the biggest struggle in my school. Maybe having a dual license in one, for special ed and deaf education, teachers would be better equipped to stay in the classroom that have those challenges
Rose hearing elementary	My supervisor is really weird and absent. I don't personally feel like I need a lot of help, but if I were a brand new teacher…well I am a new teacher in this job. I don't know how the grading system works. My supervisor has a lot on her plate and is forgetful about returning emails or it takes a long time. I quickly learned that I needed to go to a colleague to get my questions answered.
Mary Deaf secondary	There are a variety of reasons why teachers leave. They have issues when administration can't keep up with the times or current trends in education - that's a problem. Or they don't really understand Deaf Ed. So we're really fortunate that our administration now keeps up trends of Deaf programs in public schools. So, the most challenging kids need a lot, they need teachers. And people might leave because the administration doesn't really get it, they're not really listening to what we need, we're not getting the support we need

	Searching for Support – Representative in vivo comments
Eve hearing secondary	Burning out is a big thing now. Sometimes I think change of administration is a good thing. That's not even to knock any admin, but I think some people get very much in a groove and have a hard time keeping an open mind to new things. Kind of like 'this is the way we are going to do this, because this is the way we've always done this.'
Sue hearing itinerant teacher	I was doing some remote teaching before COVID. I've been seeing kids in other states virtually for a couple of years now. I liked that I was in the schools part of the time, but also seeing a few kids remotely. So when COVID happened, it was an easy transition because I was already comfortable. But after a few weeks of being only remote, I hated it. I had headaches, I was grumpy. That modality full time is not for me. I know the field is moving toward a more remote model so we can reach more students, but I personally would not be able to do a full time remote job at all. I would leave.

Table 42. ***Disparate Pay Issues***

	Disparate Pay – Representative in vivo comments
Ann hearing early childhood SPED licensed	Education in general is not a money-making career. It's more doing what you love. But looking at pay is a piece that could help teachers stay.
Eve hearing secondary	Specifically, at my school, I would say that teacher pay is a huge piece. It's common knowledge by other deaf schools that teachers get paid more than we do. So we lose a lot of staff that way, who are great teachers. It's an ongoing issue. When you ask why they're leaving , it's usually related to money.

	Disparate Pay – Representative in vivo comments
Rose hearing elementary	I make more money now teaching [in a public school]. I'm on the lowest step, only given three years of credit for my previous teaching and working 10 months [at public school]. The Teacher's Union didn't give me credit for my 16 years of teaching. And I still make more than when I was running a department before [at private deaf school]. We need more people of color and deaf people to be teachers [pay issues being one challenge]. I remember there was a black deaf woman who taught with me, she came up from the south and she worked for one year. It was incredibly expensive. She could barely make ends meet. She was a single mom, there were no black people in her department, and she was lonely for her community, so she went back home.
Wendy hard of hearing itinerant	A teacher of the deaf started in my program this school year and she left in January. She left teaching deaf and hard of hearing kids to go teach hearing kids. She left because she needed better insurance, not because she wanted to stop teaching deaf and hard of hearing kids. Before she left, she tried talking to the administration about insurance, but that's all they could offer her. She tried to stay but couldn't afford to. Moving to the public school, she was able to get an insurance plan that she could afford and that could cover her child.
Mary Deaf secondary	Money - it's a lot of work, adapting materials, and the teachers don't get paid well. Again, [my school] is the most competitive, and pays more than the other private schools.
Sue hearing itinerant	The pay is challenging, but I'm choosing to work for [private deaf school] versus a school district. I've been offered jobs by the districts I work in. I really like the freedom and having a network of other teachers of the deaf to collaborate with, so there are a lot of pros. It's definitely my choice if I want to work for a district. The option is out there all the time, but I don't want that. It would be nice to be paid more. We're supposed to be the expert and I know the regular education teachers are being paid more than I am.

Teacher Pipeline

Participants discussed various aspects of how they became teachers of DHH students and offered ideas to bring others in the field. I personally found these teachers' ideas the most informative part of the interviews. Sub-themes were developed around the following topics: *becoming a teacher*, *limited exposure* (to language acquisition/ASL, deaf schools, DHH people or the deaf education profession), *accidentally finding out deaf education was a job*, and *PR issues.*

Participant comments about teacher pipeline for each of the sub-themes are listed in the tables that follow. Results from the survey indicated that the average age respondents knew they wanted to *become a teacher* was 16 ½ years. The background of when or how they "knew" they wanted to be a teacher is explored further in Table 43. Challenges to learning about deaf education was expressed as *limited exposure* to aspects of the field. Hearing teachers discussed their lack of exposure to ASL, deaf schools, DHH people or the deaf education profession. DHH teachers indicated that envisioning themselves as educators of deaf children was not on their radar as they considered future professions (Table 44). *Accidentally finding out deaf education was a job* was an enlightening aspect of the interviews. Every hearing teacher reported finding out about becoming a teacher of DHH children completely by accident – often a chance encounter with someone who guided them toward the field. None of the hearing interviewees had a relationship with a DHH person which influenced them to become a TODHH. Mary and Wendy, teachers who were DHH themselves, attended public schools growing up. They both described a moment where they either saw a DHH teacher or were encouraged by others to go into deaf education, which influenced their perspective of teaching DHH

students (Table 45). Teacher comments revealed that it was evident that deaf education has a significant problem with public relations; in Sue's interview, she stated that "deaf education has a *PR issue*, No one knows it exists." A similar sentiment was echoed by every hearing teacher interviewed. In addition, Mary (Deaf) and Wendy (hard of hearing), who both attended mainstream schools growing up, indicated that meeting other DHH adults influenced them to work with DHH children. In Table 46, teachers identify concrete ideas to increase the pipeline into deaf education teacher education programs, in order to address the teacher of the deaf shortage. Research-to-practice ideas for addressing teacher pipeline issues will be outlined in the section on policy implications.

Table 43. ***Becoming a teacher***

	Becoming a teacher – Representative in vivo comments
Holly hearing secondary	My parents told me when I was in first grade, I said I wanted to be a teacher. I tend to have this stubborn streak. So, because I said it, it had to happen.
Ann hearing early childhood SPED licensed	When I was in high school, I worked in a daycare and I just loved being in that setting, so I went to school for teaching. As I went through schooling, I decided I wanted to focus on the younger ages. So I got my early childhood degree, then I think with my master's degree (in special education), my initial thought was that if I had a dual license, I would be more marketable.
Rose hearing elementary	I was probably 22 and took a year off from undergraduate before I was applying to medical school. And during the year I took off, I worked in a preschool and I loved it. I just decided I didn't want to become a doctor anymore, I wanted to be a teacher. Much to the chagrin of my family. I wanted to be a doctor my whole life – 22 years. So that's just sort of what I thought I would do when I grew up. So it was a big shift

	Becoming a teacher – Representative in vivo comments
Eve hearing secondary	I popped out of my mom saying I am going to be a teacher (LAUGHING) Obviously not literally, but my entire life, I have always said I want to be a teacher. When other kids said they wanted to be a firefighter, or whatever, I always said teacher, teacher, teacher. Never strayed from that.
Mary Deaf secondary	I knew I wanted to be a teacher when I was in middle school. I had good relationships with several of my teachers. When I was in high school, I met a teacher who was hard of hearing herself and I thought – Wow, you can be a teacher and be successful and be hard of hearing? That was pretty amazing.
Wendy hard of hearing itinerant	When I was 20 and I already had my bachelor's and was working, I couldn't find a job in professional writing and I thought I wanted to get a master's degree in anthropology. I ended up as an aide in a deaf ed classroom (LAUGHS). I didn't like getting paid so low, so some of my co-workers said "you should go back to school to be a teacher of the deaf."

Table 44. ***Limited exposure***

	Limited Exposure – Representative in vivo comments
Wendy hard of hearing itinerant	If someone sees a teacher, they don't think 'I want to work with other deaf kids like me.' When they're thinking about teachers, they're thinking of what they typically see on TV. We don't see representation on TV. When you don't see something existing in your everyday life, you don't realize that it exists at all or that there's a need.
Rose hearing elementary	I had no exposure to deaf people growing up. Just Linda Bove on Sesame Street.
Eve hearing secondary	When I was in third grade, we were members of a lake and went there everyday during the summer. There was a family that would go there. The mother was deaf and the children were hearing. But I never really knew them. I would see the deaf woman communicating with her children. I didn't know them. I didn't know how to communicate with her. I wasn't going to go up to her children and start asking questions, you know.

	Limited Exposure – Representative in vivo comments
Ann hearing early childhood SPED licensed	My first encounter meeting a deaf person was when I was teaching a deaf student after I got my license in special education.
Mary Deaf secondary	The first deaf person I met, not really formally, was in one of my BU classes. He I had an interpreter. It was the first time I ever saw that. I was jealous because that person understood everything. I was oral and watched the ASL interpreter trying to figure things out. The first deaf person I really got to know was [when I worked in the dorm at] Boston School for the Deaf . He was deaf from a deaf family. I was 22.

Table 45. ***Accidentally finding out deaf education was a job***

	Finding the profession by accident – Representative in vivo comments
Ann hearing early childhood SPED licensed	As I was going through my master's degree (in special education) I wasn't sure what to do next. But the President (of my college) was on the Board of Trustees (of the school where I currently work). He said, 'you should go and talk to the director there and see what you think about it.' And I went there and have been there ever since. [Expansion question: "so…if the university President hadn't mentioned this particular school for the deaf…"] I would have never known that deaf education existed.
Rose hearing elementary	I was taking an ASL class, because I love languages. And I asked my professor what I could do with ASL as a job, and she said 'there's such a thing as deaf schools, did you know that?' I did not know that. So I looked into it, then looked into programs and BU was closest to where I was living at the time, so I thought 'I'll go to BU."
Holly hearing secondary	I took some sign language classes in undergrad. I learned more about deaf kids through the guy who taught my sign language classes. He used to foster high-risk deaf kids. He told us these stories and taught us a lot more about what they go through. In general, initially I was just all about the language as most hearing people are. But he made a strong impact on me in terms of just learning about deaf kids.

	Finding the profession by accident – Representative in vivo comments
Sue hearing itinerant	I didn't know anyone with hearing loss. I knew nothing about this job. I reconnected with [early childhood professor] at a social gathering and was explaining to her that I didn't know what to do with my life. She told me then about the MED (deaf education) program. It was just kind of happenstance in some social gathering with her at Smith, where she happened to mention the deaf education program because I happened to say that I don't know what to do with my career. How did I go through four years of undergrad at Smith as an education major, living in Northampton and after college, I never knew [school for the deaf] existed? Never knew the deaf education program existed? I knew about the school for social work at Smith. Their regular education programs were highly promoted. I never knew about the deaf ed program.
Eve hearing secondary	I never thought of deaf ed as an option until I was in college. And that was only because I took ASL and my teacher was encouraging. I could have been on a completely different path if I went to another school, if they didn't offer ASL. I still would have been a teacher but not of deaf students.

Table 46. ***Making deaf education visible***

	Making deaf education visible – Representative in vivo comments
Holly hearing secondary	Undergrad programs need to promote all of the options for teaching that are out there. Everyone knows you can major in elementary education versus special education. Everyone knows that.
Ann hearing early childhood SPED licensed	It needs to be offered at more colleges. Deaf education is very under-advertised. I remember when I was searching for (graduate) programs and I didn't really come across deaf education. That would be a start to up the interest level in working with deaf people. Even in college when talking about students who were deaf, it was mentioned in my special ed program, but not how to teach students who are deaf. It wasn't a category and we really didn't talk about it. If I didn't work at [school] I wouldn't even know there was a Deaf community.

	Making deaf education visible – Representative in vivo comments
Mary Deaf secondary	We have to get people who are interested in sign language to come and volunteer. They can volunteer in the school to see how deaf and hard of hearing kids are being taught. And they'll fall in love with it from there. Maybe the psychology majors will change their mind and go into Special Ed or deaf ed. I remember there was a hearing boy in high school – his high school class and my high school class collaborated with each other. His high school class was learning ASL, my high school class needed to socialize with hearing kids how to learn to communicate with them. It was a good experience for both groups. So once a month we got together. And this boy is now a teacher's aide in our school, and he's studying to become a teacher of the deaf. So, inviting people to come and volunteer. I think that if they see they'll fall in love with it. When I worked in a dorm, there was a woman who worked with us. She wasn't crazy about that experience, but became a teacher of the deaf, and now she's working as an interpreter in California. But that's one way to pull people and it's come in, observe people who need internship experience, come in, come in. Give them some incentives. When I did my internship at American School for the Deaf, they let me live there. They had rooms. So it was easy for me to be involved in the dorm life, not just providing counseling, but in the dorm life too. We need to have those people come and see our students.
Wendy hard of hearing itinerant	When you don't see something existing in your everyday life, you don't realize that it exists at all or that there is a need. So the kids are not seeing that this is an option. When you look at posters for community service workers, you don't normally see a teacher who is working with deaf and hard of hearing kids, or any kid with a disability. You see a teacher in front of a mainstream classroom. We have to make it visible. I don't have any memory of a deaf ed program at any of the college fairs I attended. There needs to be handouts describing deaf education as a career. We have to have a bigger presence. If it's not in their face, they're not gonna know about it.

	Making deaf education visible – Representative in vivo comments
Rose hearing elementary	Offering ASL in high schools is starting to be more popular. But there should also be posters in the guidance office where kids, as they're applying to colleges, they can learn "AND you can be a teacher of the deaf!" I feel like a national public service announcement is needed, ads on our on television, and you'd have, maybe, Gallaudet or other Deaf or disability groups, or a government grant could co-fund advertising to get the word out. I think it's doable, but it needs to show up on your Facebook feed, or Instagram, or some app. Some advertising money is needed.
Sue hearing itinerant	Undergrad programs need to talk about it. I took so many SPED classes and I think hearing loss was maybe a page in a generic special ed book. We learned about ASL and some people wear hearing aids…and then move on to autism. There needs to be more of a conversation about this, like, 'hey, this is a thing and it's a job! And there are programs for that.' We learned about ABA, we learned about what SLPs are. We learn about all the other things. But there's no conversation about teaching deaf and hard of hearing.
Eve hearing secondary	Reach out to high schools and to undergrad programs and get people thinking. Deaf schools should invite them to come to the school, do a tour, sit in on a classroom, offer ASL classes. Of course, not everyone taking ASL will become a teacher, obviously, but you might grab someone that way, 'oh I was going to become a nurse, but I think I want to do this instead.' Maybe a 'Deaf adults in different careers' type of thing, but for education program. It could pull in more people that wouldn't have considered it.
Holly hearing secondary	Programs are shutting down for instructing future teachers of the deaf individuals. Some of those programs are only private schools, which are expensive. If I could have gone to a state university that had a deaf ed program, I would have.

Integrating Quantitative and Qualitative Data

In a previous section, Table 16 identified the *most satisfied* and Table 17, identified the *most dissatisfied* items from teacher survey responses. Table 47 is a compilation of these two tables, In response to the interview prompts "what are your greatest joys about teaching DHH students" and "what are your challenges teaching DHH students," teacher responses that addressed the survey responses are shaded below. Professional development was specifically asked as an interview question in order to explore these concerns more in-depth.

Table 47. ***Survey items discussed by interview participants***

Satisfied/Very Satisfied	Dissatisfied/Very Dissatisfied
Structuring lessons and experiences that promote learning	State assessment test for students
Importance and challenge	Availability of appropriate tests for students
Working with students from diverse cultures	Time for non-teaching responsibilities
Working with a wide age range of students	Professional development related to deaf education*
Explaining important vocabulary and concepts	Time to collaborate with school staff
Attending/contributing to IEP meetings	Providing students with deaf adult role models
Opportunity to use past training and education	Time to collaborate with families
Teaching complex subject matter	Family involvement
Number of students on caseload	Salary and fringe benefits
School safety	Teacher evaluation system

Note. Survey data results indicating most satisfied and most dissatisfied responses. Shaded items were topics discussed by interview participants.

* indicates an interview question specifically asked.

CHAPTER 5

Discussion

It is important to frame the context of what was occurring in the world when this research took place. The survey opened prior to the COVID-19 school shutdown (95% of the surveys were completed prior to March 16, 2020 when Governor Baker closed Massachusetts' schools) and ended as teachers were teaching from home. The interviews all took place at the end of the 2019-2020 school year, while teachers were teaching remotely, or during the summer of 2020, when teachers were providing remote extended school year services. At the same time, the United States was embroiled in the Black Lives Matter movement. It is naïve to assume an historical worldwide pandemic and national social justice initiative did not impact the teachers' responses. Questions related to these events were not explicitly asked, however, teachers expressed concern about systemic inequities for their DHH students and families including food and shelter insecurities, mental health issues, language deprivation and restricted access to language models.

Study purpose

The U.S. is experiencing a severe shortage of TODHHs. This study used a Mixed-Methods Sequential Explanatory Design to comprehensively document the current workforce of teachers of DHH students in a single state (Massachusetts). Participants responded to demographic questions, completed the Job Satisfaction of Teachers of Students who Are Deaf or Hard of Hearing survey, and provided qualitative information about recruitment and retention of teachers of DHH students.

Quantitative survey responses of Massachusetts teachers of DHH students were compared to Luckner and Hanks (2003) and Luckner and Dorn (2017) that used the same survey with national samples, in Tables 16 and 17. Further comparisons of *satisfied/very satisfied* and *dissatisfied/very dissatisfied* responses of the current study with previous studies is outlined in Table 47. For each satisfaction level, Massachusetts responses closely resembled Luckner and Dorn (2017) responses. In addition, all Massachusetts responses for Luckner and Hanks (2003) were also responses in Luckner and Dorn (2017). As indicated in Table 48, there were two *satisfied/very satisfied* responses made by Massachusetts teachers which were not found in either national study: *teaching complex subject matter* and the *number of students on caseload*, which is encouraging. Not surprising based on the qualitative responses, *salary and fringe benefits* was identified as a most *dissatisfied/very dissatisfied* response by Massachusetts teachers, yet did not make the top ten in either national study.

Table 48, *Comparison of current study with previous studies*

	Luckner & Hanks, 2003	**Luckner & Dorn, 2017**
"satisfied" or "very satisfied"	5/10	8/10
Massachusetts satisfied responses not included in the top ten of either national survey:	• Teaching complex subject matter • Number of students on caseload	
"dissatisfied" or "very dissatisfied"	8/10	9/10
Massachusetts dissatisfied responses not included in the bottom ten of either national survey:	• Salary and fringe benefits	

Addressing the Research Questions

What are the reasons that bring teachers into the field of deaf education?

Sixty-one percent of survey respondents indicated they had personal experience with a DHH person that influenced their decision to enter deaf education. However, when this was explored further all hearing interviewees reported that they happened to meet someone that steered them toward working with DHH students and appeared to accidently "fall into" the profession. In her interview, Sue stated that "deaf education has a PR (public relations) issue, No one knows it exists." A similar sentiment was echoed by every hearing teacher interviewed. Two interviewees (Sue and Ann) were encouraged by university personnel to consider working in deaf education, without ever having met a DHH person. Three hearing teachers (Rose, Eve, and Holly) happened to take an ASL class as an undergraduate student, and had not known a DHH person prior to taking that course. Mary and Wendy, the DHH interviewees, attended public schools, and not schools for the deaf. Both of them reported receiving external encouragement to become a teacher, either by having a DHH teacher as a model to consider for a future career, or working as a teacher's aide in a deaf education classroom and receiving encouragement from colleagues. As we are considering ways to address the shortage, this concerning issue can be summarized by the Marian Wright Edelman, quote, "You can't be what you can't see" (Siebel Newsom, et al., 2011).

Of the survey participants who graduated with a master's degree in deaf education, about half (80 participants) reported receiving funding/tuition waivers to become a TODHH. When asked if funding were not available, would they have considered taking out loans, etc., to become a TODHH, only 33 participants (41% of that

group) indicate they *definitely would* take on debt to enter that degree program. Sue (an itinerant teacher), was the only interview participant who received a tuition waiver (from a program that has since closed) to become a TODHH. She stated she would not have majored in deaf education without that funding. Several interviewees mentioned concerns about the expense of the private universities they attended for deaf education, and then had difficulty earning a living at the private DHH schools where they worked.

What are the challenges to becoming a certified TODHH in Massachusetts?

Teachers reported the challenges to becoming certified lie in taking and passing the MTEL exams. Costs associated with taking and retaking exams can be a barrier. Locating review courses and finding time to take them with competing job and family responsibilities are also challenging. Some teachers interviewed were visibly uncomfortable discussing the MTEL exams that they took more than once. Math MTELs were challenging, based on a large number of survey and interview responses. Several survey participants and Mary, one of the interview participants, expressed relief they were "grandfathered" with a teaching license, before MTELs were required.

Issues of moving to Massachusetts after previously working as TODHHs in other states were identified in both the qualitative survey questions and the interviews. This barrier, termed *duplication frustration*, was described as previously passing tests which were not accepted for Massachusetts licensure, and that their previous experience and licensure as a TODHH did not count toward licensure in this state.

What is the level of satisfaction for different subsets of Massachusetts TODHHs (teacher experience, deafness status, job responsibility) in in their work?

Teacher interviews revealed that teachers generally enjoy their students, the student groups they taught, their school community, and that they knew their work fostering language development was important. Survey responses indicated no statistical differences about job satisfaction among teachers' deafness status (D/deaf, hard of hearing, hearing), or job responsibility (early childhood, elementary, secondary, itinerant). Job satisfaction by years of teaching experience was statistically significant between teachers with 0-10 years of experience being statistically less satisfied in their work than teachers with 21-30 years of experience.

Professional development concerns, tied to the teacher satisfaction research question, were explored further in the qualitative interviews. Although teachers expressed frustration about identifying a variety of appropriate professional development opportunities specific for the DHH students they work with, several teachers positively mentioned the DESE-supported Deaf Education Institutes that they attended. Institutes are weekend, evening, and summer professional development opportunities for Massachusetts teachers of DHH students who use ASL, and have been funded by DESE since at least since 2005 (R. Hoffmeister, personal communication, July 28, 2020). For the 2019-2020 school year, five Institutes were provided in the following areas: Educational Interpreting; STEM Content in ASL; Intensive ASL Training; Literacy Skills to Students Who Are Deaf or Hard of Hearing and use ASL; and Early Childhood (S. Recane, personal communication, July 23, 2020). I personally attended the literacy and early childhood Institutes during the 2019-2020 school year. However, as detailed in the

section below on policy implications, four out of five of these Institutes were unilaterally cancelled by DESE beginning next year.

What ideas do current TODHHs working in Massachusetts have to address the shortage in our state?

The survey responses revealed that there were two aspects to this question that needed to be considered: how to recruit candidates into the deaf education pipeline and how to retain teachers from leaving (either leaving private deaf education schools for higher paying public schools, leaving to teach hearing students, or leaving the profession completely).

Recruiting candidates into the deaf education pipeline

Survey responses provided the first indication that many current teachers found the profession by accident. In interviews, it was clear that all of these teachers, although interested in teaching, did not know that deaf education was an option until some chance experience steered them in that direction. The DHH teachers interviewed considered entering deaf education only after having one hard of hearing teacher in high school (Mary) or being encouraged by colleagues while working as a teacher's aide in a DHH classroom (Wendy).

Teachers noted that they did not learn about deaf education from their high school guidance counselors, in college fairs, nor at their undergraduate university (even though Sue, the itinerant teacher, attended a university that had a graduate deaf education teacher preparation program).

Teachers interviewed made suggestions to promote the profession, which could be implemented as a public relations campaign with local partnering opportunities to

inform high school and undergraduate students about the field. Specific suggestions included an advertising campaign (funded by state departments of education or Gallaudet University), partnering deaf education programs and schools for the deaf to participate in career fairs and networking, provide volunteer opportunities, inform undergraduate education and special education courses about deaf education as a profession, and offer ASL classes or clubs. These teachers also suggested ideas that are generally part of "Grow Your Own" approaches to recruiting BIPOC teachers: supporting teacher aides and DHH high school graduates to become teachers, reaching out to certified teachers to pursue graduate degrees in deaf education, as well as identify and share information about part-time and flexible deaf education teacher preparation programs for these possible recruits.

Retaining teachers in deaf education classrooms

Survey responses and interviews both addressed the concerns of teachers not feeling supported and disparate pay issues. Ideas to resolve some of these issues are not simple to incorporate, but should be discussed as we are addressing teacher shortage issues.

Searching for support

Teachers are frustrated that school administrators (in both schools for the deaf and public-school settings) do not always understand the role and specific needs of TODHHs, and often were too busy to answer everyday questions, let alone provide support with more complicated issues. In non-deaf education, public school settings, teachers are frustrated that administrators do not understand the needs of DHH children or why the role of the TODHH is needed. In survey comments teachers wondered if trainings for

public-school administrators could be offered (which, to my knowledge, does not yet exist as a formalized training). Mary, the interview participant discussed a mentorship program at her school to provide support to classroom teachers. She described that there were four experienced teachers each responsible for mentoring five newer teachers. The mentor teachers received a stipend. Regular meetings took place between the mentor/mentee and they were available to ask routine questions. As a basic support premise, mentorship by experienced teachers should be readily available to provide regular support to newer teachers (particularly when administrators are spending a significant amount of time managing urgent issues). In addition, Deaf teacher-mentors, and their lived experiences as DHH people, should be considered mentor models in all settings for hearing teachers and administrators to learn from.

Disparate pay

In both the survey and interviews, Massachusetts TODHHs discussed that the disparate pay differences between private schools for the deaf and higher paying public school settings need to be addressed to prevent teachers leaving. This situation is much harder to resolve. Teacher salaries in Massachusetts special education private schools are funded by public school district tuition for each student to attend the private school. What a school district pays private special education schools is "…based on the approved tuition rate set by the state's Operational Services Division" (MA DESE, September, 2008). While disparate pay cannot be easily resolved, it is important to acknowledge that this policy issue is a barrier for maintaining teachers in these specialized placements.

Study Limitations

These findings should be interpreted while taking into consideration potential limitations of the study design and implementation. Considerations for other limitations may extended beyond those listed below.

Videos describing the study and the consent form were available in American Sign Language. However, the survey was distributed in written English, which may have impacted the decision of teachers whose first language is not English to participate in the survey.

This study attempted to survey the Massachusetts population of teachers working with DHH students. One limitation is that we do not know how many teachers with deaf education licenses are still teaching. DESE reports there are 413 active Massachusetts TODHH licenses (Table 3) and 32% of teachers with these licenses responded to the survey (Table 11), however, there is no way to know how many of these licensed teachers are still teaching DHH students, and there is no systematic way to contact them.

Due to the COVID-19 pandemic, Boston Public Schools (BPS) research applications were put on hold for the 2019-2020 school year. Although the intention was to survey every teacher of DHH students in Massachusetts during this school year, BPS teachers could not be actively recruited to participate in this research. In the 2018-2019 school year, the Boston Public Schools employed 43.6 FTE teachers of deaf students including teachers at Horace Mann School for the Deaf (MA DESE 2019). Through a "snowball" approach nine respondents indicated they worked in Suffolk County (Boston), which represents only 21% of Boston teachers of DHH students. Therefore, this segment of the Massachusetts TODHH population was not sufficiently accessed.

The demographics of Massachusetts teachers are overwhelmingly white and female (EdTrust, 2014) which is consistent with the survey responses of teachers of DHH students in this study. Interviewees were randomly selected through a maximal variation sampling process and all participants who agreed to be interviewed were white females. The majority of ideas for recruiting teachers into the deaf education pipeline and retaining TODHHs in classrooms were provided by hearing, white, female individuals. These ideas, however, cannot be assumed to be appropriate or applicable for recruiting and retaining teacher candidates who are DHH, male, BIPOC, or have intersectional identities. In addition, the interviewees all identified they would continue teaching until retirement and represent a potentially biased sample of motivated, highly dedicated teachers. It cannot be assumed that the retention ideas expressed by these teachers are generalizable to TODHHs who do not have similar intention to stay in the field.

Further research

This study begins to pinpoint that the field of deaf education is not a widely visible option for aspiring hearing teachers and suggests that teaching may not be considered as a professional goal for some DHH people without mentorship. Research with public middle and high schools is recommended to identify deaf education pathway opportunities for students who may be considering teaching or human service careers. In addition, research within DHH schools and programs is needed to identify the current information their middle and high school students receive about becoming a teacher, and how students and DHH paraprofessionals could be mentored to consider the teaching profession. Along this thinking, research and mentoring partnerships between schools for

the deaf, deaf education teacher preparation programs, and public middle/high school students are needed to establish a sustainable pipeline of TODHHs.

Research within university education and undergraduate human service majors is recommended to determine how deaf education as a profession is communicated to undergraduate students. In addition, further research with special education and general education teachers on their knowledge and interest in deaf education might provide insight into ideas for recruitment from a group that did not enter the deaf education profession.

In order to identify issues and develop ideas specifically addressing equity and diversity recruitment, further research specifically with TODHHs who are BIPOC and have DHH intersectional identities is needed. Only a limited number of BIPOC teachers responded to this survey (six respondents who indicated they were non-white and five Hispanic participants); a national focus is needed to recruit a larger sample, and to identify issues that can be generalized across rural, suburban, and urban locations.

To identify additional ideas to retain TODHHs in classrooms, further research with former teachers of DHH students should be considered. These former teachers have the experience of being in the classroom and could provide insight as to what may have kept them from leaving the field. Additional work with DESE analysts would be helpful to identify potential ways of determining if TODHHs have retired, are working in other areas of education, such as teaching hearing students, have moved out of state, or have left the education field altogether, in order to have an accurate count of current licenses.

Policy Implications

This policy implications section connects research analysis ("what was found?") to practice and implementation ("what do we do about it?") from a broad federal, state, and local policy perspective. This section was included to bridge research findings and identify solutions within a research-to-practice framework (Tabak, 2012).

Increasing the pipeline

A campaign to increase the TODHH pipeline needs to be an intentional, cooperative, and organized effort by experts in deaf education (via multiple agencies: DHH educational policymaking organizations, university teacher preparation programs, and K-12 school for the deaf partners) to make the profession *visible*. The University of Northern Florida, which has a Deaf Education Study Abroad in Haiti program, identified an unexpected recruitment benefit from the experience:

> Prior to the trip, none of the participants were declared majors or minors in Deaf Education; however, two participants are now minoring in Deaf Education, one is majoring in Deaf Education, and one is majoring in special education (Kilpatrick & Millen, 2020, p. 244).

International opportunities can provide rich experiences; however, recruitment efforts should be intentional and not require such expense. Resources for teacher recruitment exist, but none specifically address the unique needs of recruiting candidates into deaf education. Research-based resources have been developed for addressing general education teacher recruitment (Espinoza, et al., 2018; Darling-Hammond, et al., 2018; Learning Policy Institute, 2016) and address strategies for recruiting BIPOC teachers (Latinos for Education, 2020; Valenzuela, 2018; Valenzuela, 2017). The U.S. Department of Education's Office for Special Education Program (OSEP) funded projects, such as the CEEDAR Center (2020) and the National Center to Improve

Recruitment and Retention of Qualified Personnel for Children with Disabilities (nd), collect data and provide technical assistance specifically to address the pipeline for overall special education shortages. State and local programs can also be a source of brainstorming and recruitment planning (Educators Rising, 2020; Florida Department of Education, nd.; "Haverhill High Celebrates Future Teachers With 'Signing Day' Event," May 10, 2019; Boston Public School High School to Teacher Program, U.S. DOE, 2016). These resources should be reviewed through a deaf education lens to determine how they can be adapted for recruiting candidates into TODHH preparation programs. However, getting someone interested in becoming a TODHH is only part of the equation; there also needs to be a spotlight on funding options.

Funding

Funding streams that support teacher preparation can help alleviate teacher shortages and directly address some of the concerns brought up by the teachers related to student debt. These streams include funding directly to states, to universities, and providing grants and loan forgiveness to teachers and teacher candidates. Funding from OSEP to states that could impact deaf education includes the *IDEA Part D Personnel Preparation Grants*. OSEP is:

> required to make competitive grants that support training activities in a few high priority areas, including: personnel development and preparing beginning special educators, personnel serving children with **low incidence disabilities** (emphasis added)… Under this authority, the term "low incidence disabilities" primarily refers to visual or hearing impairments and significant intellectual disabilities… (U.S. Department of Education, February, 2020).

Funding from OSEP to universities include the *Higher Education Act Teacher Quality Partnership (TQP) Grant Program*, which:

> seeks to improve the quality of new teachers by creating partnerships among Institutions of Higher Education (IHEs), their schools/colleges of education and arts and sciences, high-need school districts (local educational agencies (LEAs)), their high-need schools, and/or high-need early childhood education (ECE) programs. (U.S. Department of Education, April, 2020).

Funding to become a teacher can include grants, such as the *Higher Education Act TEACH Grant Program* which:

> provide grants of up to $4,000 a year to students who are completing or plan to complete course work needed to begin a career in teaching…(in a) field that has been identified as high-need by the federal government, a state government, or a local education agency, and that is included in the annual *Teacher Shortage Area Nationwide Listing* (Federal Student Aid, nd[a]).

Funding can also be found in the form of student loan forgiveness, such as the *Higher Education Act Public Service Loan Forgiveness Program* (Federal Student Aid, nd[b]), the *Teacher Loan Forgiveness Program* (Federal Student Aid, nd[c]), and the *Loan Forgiveness for Service in Areas of National Need* (20 U.S. Code §1078-11).

"Policymakers need to spend more time listening to educators."

This section title is borrowed from an article in *Education Week Teacher* (Ferlazzo, 2017). Educational policy discussions and decisions must include education, content, child development, and classroom management experts – teachers. Unfortunately, this does not always happen. The focus of the current study was to center the opinions of educators in the deaf education teacher shortage discussion, valuing their "insider" perspective. However, if teachers are not invited to participate they need to push their way into the policy discussions. If teachers are not involved in these

discussions then decisions will be made without the teacher-expert perspective. And if teachers are not involved in these decisions it is very likely issues that are important to educator-experts will not be considered or will be discarded.

Case in point is the recent cancellation of four of the five DESE-sponsored Deaf Education Institutes funded since 2005. On June 11, 2020, the Deaf Education Institutes Coordinator sent an email to Institute participants informing them that DESE ceased funding for future Institutes with the exception of the early childhood course. I followed up with the Coordinator to find out the background and history of the Institutes. Over the past few years between 25-32 teachers participated in each Institute. A DESE email sent on April 14 indicated that they were putting out a Request for Responses (RFR) which indicated "DESE is seeking a vendor to engage a cohort of districts/schools in MA to plan for special education success specifically for students ages 5-13, and provide high-quality PD to those districts/schools." Due to this priority shift, the email continued "as the Department embarks upon a different course of action for providing targeted professional development and coaching to districts as mentioned in the RFR above, we will not be renewing the following courses for FY21…" (S. Recane, personal communication, July 23, 2020).

While writing this section, a TODHH colleague texted me about an online professional development course specific to deaf education which only offered Continuing Education Units (CEUs) and not Professional Development Points (PDPs) needed by DESE. When I suggested contacting DESE to have the CEUs converted to PDPs, this was her frustrating response:

> There are a lot of hoops to jump through. The hours have to be part of a themed topic PD that equals 30 hours, so I would have to find at least two other PDs to attend along the same topic. Definitely not straightforward like CEUs. I will still likely take it, but just bummed now that the literacy institute is not happening. I need to get more PDPs. (Anonymous, personal communication, July 31, 2020).

Teachers in this study were asking for *more* professional development opportunities specific to the needs of their DHH students, not less. As indicated in Chapter One, there is a Steering Committee between DESE and MCDHH that meets several times a year to discuss issues critical to deaf education. Professional development was not included in any recent Steering Committee agenda. A unilateral decision by DESE to cut this longstanding professional development opportunity for a low incidence population, without discussion by experts in the field, is troubling. During the first Steering Committee meeting of the 2020-2021 school year this objection was discussed by the members. The outcome is that a statewide survey of TODHHs will be developed by a subcommittee to gauge interest in various professional development topics.

In the words of federal education policy consultant, Dr. Jane West, "If you're not at the table, you are probably on the menu" (West, 2020). Teachers – <u>you</u> are education experts and your expertise is needed at the policy-making table.

APPENDIX A – SURVEY PILOT REQUEST EMAIL

12/26/19

Dear___,

Thank you for your willingness to pilot my dissertation survey. The link is below and the ad is attached. Please do not share this link with anyone. The survey should take you less than 20 minutes to complete. Here is the feedback I need from this pilot process (please put this information in an email):

1. Exactly how long it takes you to complete the survey;

2. Please let me know of errors, problems, spelling issues, cultural issues with the survey

3. Did I forget to ask anything that is obvious, glaring, or that YOU would want to know from a statewide Teacher of the Deaf survey?

I want to send out the link across Massachusetts beginning the week of Jan 13. It would be ideal if you could complete it and provide feedback by Jan 3. If you need more time, please let me know the date you will be able to complete it. If you are not able to complete it in this time period, please don't worry...just let me know. I truly appreciate your help on this project. Happy New Year!

APPENDIX B - SURVEY

PART 1a – Background (Demographics)

Q1: Total years of teaching experience (including this year): ___

Q2: What is your sex/gender

Female.....0
Male.....1
Prefer not to say.....2
Prefer to self-describe (fill in).....3

Q3: Age: ____

Q4: Race (categories based on U.S. Census Bureau): (drop down)

Asian.....0
Black; African American.....1
Native Hawaiian; Pacific Islander.....2
White.....3
Two or more races.....4

Q6: Ethnicity (categories based on U.S. Census Bureau): (drop down)

Hispanic/Latino.....0
Not Hispanic/Latino.....1

Q7: I am:

D/deaf.....0
Hard of Hearing.....1
Hearing.....2

Q8: Highest degree earned:

Bachelors (BA, BS).....0
Master's (MA, MS, M.Ed., Ed.M.).....1
Specialists degree (Ed.S., CAGS).....2
Doctorate (PhD, EdD).....3
Other.....4
(please indicate): ___

Q9: Did you get your teaching degree from a Massachusetts university?

Yes.....0
No.....1

Q10: Do you have a degree in deaf education?

Yes.....0
No.....1
I am currently a student in a deaf education program.....2

Q11A: (If Q10=No)
My graduate degree is from (university name): ___
My degree is in (indicate program, if not deaf education): __

Q11B: Where did you get your degree (or are a current student) in deaf education: (drop down):

Boston University 0
Columbia University.....1
Fontbonne University 2
Gallaudet University.....3
Hunter College.....4
McDaniel College.....5
National Technical Institute of the Deaf.....6
Smith College.....7
My deaf education university is not listed (please indicate university below).....8

List a university name: ____

Q12: Did you receive funding from the university or a grant to become a teacher of the deaf/hard of hearing?

Yes 0
No.....1
(If Q12=yes, skip to Q14)

Q13: If funding was not offered, do you think you would have paid tuition (or applied for loans) to become a teacher of the deaf/hard of hearing?

Definitely yes.....0
Maybe yes.....1
Maybe not 2
Definitely not 3
I don't know.....4

Q14: What year did you graduate with your teaching degree?

Q15: Which best describes the graduate program you attended/are attending:

All classes in person at the university (or a satellite center) 0
All classes online 1
Blended or mixture of online and physically attending classes (including weekend-only or summer classes) 2

Q16: How satisified were you with the type of program you attended (physical classes, online, blended)

Very dissatisfied (I would **not** choose this model again) 0

Dissatisfied 1
Satisfied 2
Very satisfied (I **would** choose this program again) 3

Q17: [Open Ended] What were the pros (positives) of learning in this type of program?

Q18: [Open Ended] What were the cons (negatives) of learning in this type of program?

Q19: About how old were you when you knew you wanted to be a teacher (in general)?

Q20: About how old were you when you knew you wanted to be a teacher of deaf/hard of hearing students?

Q21: Did having personal experience with someone who was deaf/hard of hearing influence your decision to teach deaf/hard of hearing children as a career?

Yes 0
No.....1

Q22: Did your teacher training program adequately prepare you for your current job?

Yes 0
No.....1

Q23: [Open Ended] Why or why not?

PART 1b – Teaching and Employment Information (Demographics)

Q24: Did you work in a different job/career as an adult (before working as a teacher)?

Yes 0
No.....1

Q25: [Open Ended] What was your job/career, before working as a teacher?

Q26: How long did you do this work, before working as a teacher (in years)?

Q27: Which Massachusetts deaf education licenses do you have? (check all that apply)

Deaf and Hard of Hearing (no language/communication mode indicated) 0
Deaf and Hard of Hearing: ASL/TC 1
Deaf and Hard of Hearing: Oral/Aural 2
I am licensed in deaf education in another state (indicate state).....3
I am currently enrolled in a deaf education graduate teacher program 4
I have requested, or received, a waiver of teacher of the deaf/hard of hearing licensure from DESE 5
I am **not** licensed in deaf education in any state.....6

I have requested or received a DESE DHH waiver

Q28: Which Massachusetts teacher licenses do you have? (check all that apply)

Early Childhood 0
Elementary Education 1
Secondary Education 2
Moderate Disabilities 3
Severe Disabilities 4
Content area (math, science, English, history, etc.).....5
Speech, language, hearing disorders 6
I am currently teaching under a waiver (described, if needed) 7
Other (please indicate license name) 8
I do not hold additional teacher licenses.....9

Q29: Do you currently teach in the language/modality in which you are certified (ASL/TC or Oral/Aural) {If Q27=2 OR 3}

Yes, everyday 0
Sometimes (I use both modalities for different students/or different classes) 1
No, I'm teaching students using a language/modality that is different from my MA teacher license 2
I only work with hearing students 3

Q30: What language/methodology do you use daily with your students (check <u>all</u> that apply)

American Sign Language.....0
Listening and spoken language (spoken English; LSL; auditory-oral) 1
Signing/talking simultaneously (sign supported spoken English; sim-com).....2
Cued Speech 3

Q31: Please check the <u>one</u> category that best describes your <u>current job responsibilities</u>

The majority of my students are hearing 0
Early Childhood Teacher (early intervention, parent-infant, preschool or kindergarten) 1
Elementary Teacher 2
Secondary Teacher (middle or high school).....3
Resource Room Teacher 4
Itinerant Teacher (working with various students in multiple buildings within **<u>one school district</u>**) 5
Itinerant Teacher (travelling to students in **<u>multiple school districts</u>**) 6
Transition (ages 14-22) 7
Early intervention (birth to age 3) 8
Administrator 9
Teacher's aide 10
Retired 11
Other (please indicate work you are doing outside of a school setting):.....12

(IF Q31=0, 7, 8, 9, 10, 11, 12 – survey ends)

Q32:

If you work in one school: what Massachusetts county is your school located in?
-or-
Itinerant teachers: select one county where the majority of your school districts are located.

Barnstable 0
Berkshire 1
Bristol 2
Dukes 3
Essex 4
Franklin 5
Hampden 6
Hampshire 7
Middlesex.....8
Nantucket 9
Norfolk 10
Plymouth 11
Suffolk 12
Worcester 13

Q33: Is this job

10 months – school year calendar 0
11 months - school year calendar 1
12 months 2

Q34: Is this job

Full time (every school day) 0
Part time 1

Q35: How many <u>total</u> students are you seeing this school year?

1-6 0
7-12 1
13-18 2
19 or more students 3

Q36: How many students do you provide <u>direct services</u> to (create lessons, teach)?

1-6 0
7-12 1
13-18 2
19 or more students 3
I only provide consultation, no direct service 4

Q37: How many students do you provide <u>consultation</u> (to general education teachers)?

1-6 0
7-12 1
13-18 2
19 or more students 3
No consultation to general education teachers.....4

Q38: What type of program pays your salary:

School for the Deaf/Hard of Hearing (766; private school; public day school) 0
Local public school 1
Collaborative 2
Early Intervention 3
Other (please indicate) 4

Q39: How often do you have access to an Educational Audiologist (easily available to you/your school)?

As needed, or on demand.....0
On a limited basis.....1
Not at all.....2

Q40: Who is responsible for making hearing technology decisions of what the students use at school (for example, FM systems, HAT, soundfield)?

(If no hearing assistive technology is used for any of your students at school, select #6 and explain.)

teacher of the deaf/hard of hearing (me or another TODHH) 0
educational audiologist 1
clinical (outside school) audiologist 2
speech-language pathologist 3
special education personnel (SPED teacher, supervisor, or SPED Director) 4
other (please indicate their role) 5
I don't know.....6

Q41: How do you rate your OVERALL background in understanding basic audiological information, including interpreting audiograms? (1 = very comfortable; 4 somewhat comfortable; 7=not comfortable at all)

1 2 3 4 5 6 7

Q42: How do you rate your OVERALL COMFORT troubleshooting/fixing students' problems with hearing technology (hearing aids, FM systems, HAT, cochlear implants) (1 = very comfortable; 4 somewhat comfortable; 7=not comfortable at all)

1 2 3 4 5 6 7

PART 2 – Job Satisfaction

How satisfied you are with various aspects of your job? Mark one of response for each item, using the following scale:

Very dissatisfied.....1
Dissatisfied 2
Satisfied 3
Very satisfied 4

Q43	Salary and fringe benefits
Q44	Importance and challenge
Q45	Amount of paperwork required
Q46	Number of students on caseload
Q47	State licensure requirements for teachers
Q48	State assessment tests for students
Q49	Professional qualifications of colleagues
Q50	Quantity and quality of feedback from supervisors
Q51	Attending/contributing to IEP meetings
Q52	Teaching auditory or speech skill development
Q53	Collaborating with teachers (inclusion; non-deaf educators) on IEP objectives
Q54	Time to collaborate with school staff
Q55	Time to collaborate with families
Q56	Teacher evaluation system
Q57	Support for managing student behavior
Q58	Availability of appropriate tests for students
Q59	Professional development related to deaf education
Q60	Opportunities to provide student with Deaf role models
Q61	Family involvement

Q62	Opportunity to use past training and education
Q63	Working with students with disabilities (“deaf plus”)
Q64	Working with students from diverse cultures
Q65	Opportunities for leadership
Q66	Working with a wide age range of students
Q67	Structuring lessons and experiences that promote learning
Q68	Teaching complex subject matter
Q69	Explaining important vocabulary and concepts
Q70	School safety
Q71	Mentoring experiences provided by my employer
Q72	Time for nonteaching responsibilities (e.g., IEP conferences)
Q73	Being part of an educational team
Q74	Job as a whole

PART 3 – Open-Ended/Follow-Up Questions

Q75: [Open Ended] What were <u>your challenges passing the MTELs</u> and becoming certified in Massachusetts?

Q76: [Open Ended] ***Think about your teacher preparation program and how it prepared you to be a <u>new teacher</u>.*** **As a <u>new teacher</u>, my teacher program <u>prepared</u> me to:**

Q77: [Open Ended] ***Think about your teacher preparation program and how it prepared you to be a <u>new teacher</u>.*** **As a <u>new teacher</u>, my teacher preparation program <u>did not prepare me to</u>:**

Q78: [Open Ended] ***Think about your teacher preparation program and how it relates to your <u>current job</u>.*** **What is <u>enjoyable</u> about your <u>current job</u>, that your teacher education program <u>prepared you to do</u>?**

Q79: [Open Ended] ***Think about your teacher preparation program and how it relates to your <u>current job</u>.*** **What is the most <u>challenging</u> aspect about your <u>current job</u>, that your teacher education program that you were <u>not prepared you to do</u>?**

Q80: [Open Ended] How much longer do you intend to work as a teacher with deaf/hard of hearing children? (provide a time period: months or years)

Q81: What will be the likely reason that you will leave teaching in a Massachusetts school?

Q82: We are experiencing a teacher of the deaf shortage. What ideas do you have for recruiting people into our field?

Q83: Is there anything you would like to include, that wasn't asked? (Or if you would like to expand on a previous answer)

APPENDIX C – CODING

Coding process

This protocol will be kept in a GoogleDrive folder for Coder #2 to access. It is the intention that the coders will have regular meetings to discuss the coding process. This protocol and the Codebook will be updated as the process of working together identifies that changes are needed. A separate document will contain meeting notes.

Please keep in mind the following when coding:

Memos

Please create a memo for each file. Information to be added to the memo:

- questions, comments,
- node description confusion,
- points to be discussed during a live meeting,
- new code ideas, etc.

A video that describes how to create a memo in NVivo can be found here (this video is a 10 minute clip of the QSR *Improving Research Team Collaboration with NVivo 11 for Windows* video, link to full video for Windows and Mac are in the Resources section. NVivo 12 memo videos have not been created yet for either platform).

Coding (Survey)

A Codebook has been created from the initial nodes and description (see Codebook section below). The Codebook will be updated each time codes are added or a description is changed.

- Initial nodes were organized under each question: Q49, Q54, Q55, and Q56.
- *Q57-UnansweredQsOrExplanations* does not have specific nodes created for it. Please code it, using the nodes created for the other questions.
- **Important: Any question can be coded with any node, not just the nodes listed under that question**.
- There is a node for ***To Be Discussed***. Please highlight anything you want to discuss in the NVivo memo and tag it with that node.
- Additional codes are encouraged! Please add your ideas to a **memo** and tag it with ***To Be Discussed*** (please don't add codes during the coding process. Codes should be added to the master file, after discussion).

Other things to consider:

- Participant responses (the original document/spreadsheet) must not be edited during the coding process. If there are any typos, etc., please make note of them in the memo. Changes will be made in the master file after discussion.
- For coding stripes, my initials are KPM. Your (Coder #2) initials are KM. Good thing your middle name wasn't "P."
- Regular memo and coding sessions will be scheduled via Zoom. Meetings can also be requested by any coder at any time. A separate document will contain meeting notes.

Survey

Files

Table B1 indicates the files that will be shared with you. The file name is indicated in the first column. The second column is the verbatim question that the respondents answered.

Table B1

File name	Question asked
Q49-ChallengePassingMTELs	What were your challenges passing the MTELs and becoming certified in Massachusetts?
Q54-HowMuchLongerIntendToWork	How much longer do you intend to work as a teacher with deaf/hard of hearing children? (provide a time period: months or years)
Q55-ReasonsLeaveTeaching	What will be the likely reason that you will leave teaching in a Massachusetts school?
Q56-RecruitmentIdeas	We are experiencing a teacher of the deaf shortage. What ideas do you have for recruiting people into our field?
Q57-UnansweredQsOrExplanations	Is there anything you would like to include, that wasn't asked? (Or if you would like to expand on a previous answer)

Survey Codebook

Table C2

Node	Description
Q49	The nodes below were created for question 49, however can be applied other questions. You don't have to code the Q# nodes to anything...this hierarchy was a way to keep the nodes organized.
MTEL subtests	
American Sign Language assessment	SLPI, ASLPI - mentions of these performance based tests to earn the Massachusetts ASL/TC licensure
Communication Literacy subtest	
Content area or other subtests	
Foundations of Reading	specific MTEL test
Math	Refers to math instruction at any level or the MTEL exam
out of state	Comments including moving to Massachusetts from out of state, taking another state's test (e.g., Praxis), or being licensed as a teacher in another state
Taking the MTELs	issues related to preparing for and taking the MTEL exams
Concerns passing MTELs	Positive or negative (see grandchild node)
Concerns for others	Concern for student teachers, or colleagues who are struggling to pass MTELs
No personal concerns	comments indicated that person passed MTELs on the first try, did not have to repeat them
did not take the MTEL	Comments that explicitly indicates that MTELs were not taken, for any reason; "grandfathered"
Expense	Costs associated with taking the MTELs or licensing courses
repeated testing	Commenter took MTELs more than once
studying for, preparing to take the MTELs	Comments related to studying for MTELs, university preparation for taking the MTELs, tutoring
Q54	The nodes below were created for question 54, however can be applied other questions. You don't have to code the Q# nodes to anything...this hierarchy was a way to keep the nodes organizated.
I don't know	

	No number given	A number was not stated, but a qualitative statement was made. Responses might include: "retire," "forever," "years"
	Range	Participant indicated a range of years that crossed the single year groups
	10-20 years	
	Less than 10 years	
	Single point in time	Participant responded to the question "How much longer do you intend to work as a teacher with deaf/hard of hearing children?? with a single number (in months or years)
	11-15 years	Intend to leave the field within this time period
	1-4 years	Intend to leave the field within this time period
	16-20 years	Intend to leave the field within this time period
	21+ years	Intend to leave the field within this time period
	5-10 years	Intend to leave the field within this time period
	Intend to leave at the end of this school year	
		The nodes below were created for question 55, however can be applied other questions. You don't have to code the Q# nodes to anything...this hierarchy was a way to keep the nodes organizated.
	Career Change	
	Different education position	Select if a different educational position was noted (for example: team chair, general education teacher)
	Unspecified	Participant indicated a change in career, but did not indicate a specific type of work, or indicated leaving education
	Family reasons	
	Money	Indicating that finances, pay, 401K etc. would be the reason for changing positions
	Moving	
	Negative statements about current position	For example: burn out, issues with administration,
	Retirement	
Q56		The nodes below were created for question 56, however can be applied other questions. You don't have to code the Q# nodes to anything...this hierarchy was a way to keep the nodes organized.
	Advertising the profession	Reaching out to encourage others to become TODs
	Colleges	Reaching out to college-age students in other majors (speech pathology, communication disorders, special education)

	High Schools	Reaching out to high school aged students via clubs (ASL clubs; future teacher clubs, career day)
	Personal Connections	Identifying specific people (paraprofessionals) to become TODs
	Recruiting from other professions	
	Current teachers need resources	Including Educational Audiologists Networking Caseload support Appropriate Schools/methods/language for all DHH students Union support Parent support
	MTEL support	
	DeafEd Teacher Training Programming	Comments related to creation or improvement of DeafEd teacher training programs
	Funding	Responses that include funding/money/tuition support (examples: free truition, tuition reimbursement, loan forgiveness, increase pay)
	Systematic changes	Rule/process/licensure changes at the DESE, state, or local school district changes Problems with the schools themselves Appropriate placement Unions Educational audiology availability Not enough teacher training programs Types of programs; language of instruction/communication mode ASL fluency (teacher) Administration training Teacher respect Parent education
Q57-Unanswered Explanations		Please use nodes under previous Q sections to code the Q57 responses. If there is a statement that does not have a relevant node, please indicate it in a memo
To Be Discussed		If you have any questions, new nodes or any situation to be discussed, please write them in a memo, and tag it with this node, so we have the questions and discussion items all in one place

Interview

Files

Attached is a spreadsheet of the nodes we can start with. I'm sending this just so you can start to look at things and get comfortable with the nodes. The **nodes are on the Excel spreadsheet**.

Node categories are on the tabs on the bottom of the Excel spreadsheet (there are 6 parent categories). Each node category has subnodes. Sentences/paragraphs can be coded with any subnode (but you can code it with just the category if there is no appropriate subnode). As before, your ideas for new nodes are welcomed and encouraged. We will discuss these prior to start coding in NVIVO.

The title of each Word file (each interview) refers to the table below.

- IHSE (the teacher is an Itinerant, Hearing, and teaches using Spoken English)
- EHA (Elementary teacher, Hearing, and teaches using ASL)
- IHHSE (Itinerant, Hard of Hearing, and teaches using Spoken English)
- SHA (Secondary, Hearing, and teaches using ASL)
- ECCHA (Early Childhood, Hearing, and teaches using ASL)
- SDA (Secondary, Deaf, and teaches using ASL)

Employment Type	Teacher Deafness Status	Language of Instruction
Early Childhood (ECC)	Deaf (D)	American Sign Language (A)
Elementary (E)	Hard of Hearing (HH)	Spoken English (SE)
Secondary (S)	Hearing (H)	
Itinerant (I)		

Interview Codebook

Job Challenges	
academic or state requirements	
administration support	
respect or understanding TODs - from SPED or admin	
caseload	
fighting for resources - space or materials	
teaching real life scenarios	
Hearing Technology	
language fluency models	
students need role models - deaf or POC	
respect or understanding TODs - from SPED or admin	
students need role models - deaf or POC	
supporting families	
teaching real life scenarios	
Keeping teachers in the classroom	
burn out	
disparate pay issues	
searching for support	
Licensure	
duplication frustration	Refers to situations when the teacher applicant is required to re-take a test because the MA requirements are different (MTEL, when they already took the PRAXIS; or taking a different ASL assessment)
learning ASL	
MTEL	

no challenges to obtaining MA licensure	
state reciprocity	
Love about job	What do teachers love about their work as teachers of the deaf?
Community	
teacher collaboration	
flexibility and freedom	
language development is my responsibility	
Modality	
students aha moment	
students themselves	
students aha moment	
teacher collaboration	
Other issues	There are specific subnodes listed, however, this is a also an opportunity to identify issues not originally mentioned.
access to educational audiology	
COVID-19	
I will stay in MA classrooms until retirement	
Inequity	
MCDHH effectiveness	
PD challenges	
Pipeline	
Accessing teacher training	
Becoming a teacher	
exposure to ASL	
finding out about DeafEd accidentally	
funding for grad school	
more exposure to DHH (schools or	

people or profession)	
PR issues	Deaf education has a public relations problem - not enough people knows that the profession exists
This teacher's exposure to DHH people	This node refers to when the exposure to DHH people happened, or lack of occurring

Coding Protocol Resources

Improving Research Team Collaboration with NVivo 11 ***for Windows****.* QSR International. Retrieved March 28, 2020 from: https://www.youtube.com/watch?v=Rl7wMrd9If0 (how-to create memos are described starting at 30.20)

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APPENDIX D – INTERVIEW QUESTIONS

Dear Teacher: Below are questions which will be asked during the interview (however, additional questions may also be asked). The questions are provided prior to the interview so that you're comfortable with them, or to think about them ahead of time.

Prior to our interview time, please read and sign the consent form, found at this link: Consent form for Interview (I am happy to answer any questions you have about the form when we meet. If you have questions, you can sign it after your questions are answered). **Abbreviations used below:**
DHH: deaf/hard of hearing TODHH: teacher of the deaf/hard of hearing

Consent Questions to be asked prior to the interview questions:
1. Do you agree to voluntarily enter this study?
2. Have you had a chance to read this consent form, and it was explained to you in language you understand?
3. Did you have an opportunity to ask questions and receive satisfactory answers?
4. Were you informed that you can withdraw at any time?
5. Do you agree for your interview responses to be video recorded and later transcribed?

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- Before we start, do you have any questions for me?
- How long have you been a teacher of DHH students?
- Tell me about the kind of work you do?
- Do you work with students' hearing technology? Comfort level? EdAud access?
- What is your teaching license? Where did you graduate from?
- Did you receive funding to become a teacher?
    - If yes, What kind?
    - Would you have become a teacher of DHH students without that funding?
- How did you decided to become a classroom teacher (in general)? At what age?
- Tell me how you decided to become a teacher of DHH students? Influences? At what age?
- What was your experience with DHH people growing up? Did you influence your decision to work with DHH children?
- What excites you about teaching DHH children?
- What are your primary challenges (about teaching, the work you're doing, the setting)?
- Tell me about your experiences (ease or challenges) with becoming certified to teach in Massachusetts.
- How much longer do you think you'll teach in a Massachusetts school?
- What are your thoughts or ideas related to the availability of professional development for teachers of DHH students?
- What are your experiences with Child Specialists from the MA Commission for the Deaf?
- If you could change anything about the work you're doing, or have done, what would that be?
- We have a TODHH shortage - what are your ideas about bringing people into the field? *And*
- What are your thoughts on how to keep teachers in DeafEd classrooms?

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