Redefining Roles of Vision Professionals in Education and Rehabilitation

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Over the last decade, many innovations have significantly changed the classroom, the nature of instructional and entertainment media, and virtual and physical built environments. As a result, we believe the roles of vision professionals, primarily teachers of students with visual impairments, orientation and mobility (O&M) specialists, and braille transcribers, have likewise changed drastically in that time period. Although the core mission of these professionals remains advancing the independence and capabilities of individuals who are visually impaired (that is, those who are blind or have low vision), the scope of practice in the field of visual impairment has undergone shifts that require the attention of fellow practitioners and professional training programs.

This thought piece is a result of observations from the field and discussions with fellow colleagues and stakeholders who are visually impaired, including a focused discussion held with attendees of the Association for Education and Rehabilitation of the Blind and Visually Impaired (AER) conference in the summer of 2016. This paper is not intended to reflect a stance but rather to open a discussion on updating professionals' roles within the field of educational and rehabilitative vision services. More specifically, it will address changes to the tools used to accomplish the mission of the field of visual impairment, the way its professionals instruct students and train future personnel, and the professional linkages that must be forged for members of the field of visual impairment to be successful in their work. Some of the principal changes discussed in this paper include:

- the effect of ubiquitous computing on daily living and learning experiences;
- the increased prevalence of multimedia in the classroom and community;
- advancements in delivery options for accessible educational materials;
- changes in the built environment (both physical and digital); and
- the need for more transdisciplinary collaborations, including partnerships in the design, technology, engineering, and architecture fields.

The Teacher of Visually Impaired Students as Accessibility Facilitator

The mission of a teacher of visually impaired students continues to be meeting students' needs according to the expanded core curriculum (ECC) (Hatlen, 1996). This teacher remains the education professional with expertise on how students with visual impairments access information and how to differentiate information and instruction to meaningfully represent concepts to these students, including overseeing the delivery of accessible educational materials (traditionally focused on the provision of large print, embossed braille, and tactile graphics). Although the scope of these teachers' responsibilities is unchanged, the manner in which the work is accomplished has changed. More use of classroom technology and multimedia educational materials has directly affected timely and equitable access to information for students with visual impairments, how these materials are delivered, and the availability of mainstream and specialized tools. Mainstream classroom technologies are increasingly prevalent and are not usually designed for low vision or nonvisual accessibility. More use of online and teacher-created materials requires teachers of visually impaired students to be more aware of digital accessibility barriers and how to overcome them, requiring a broader knowledge, vocabulary, and collaboration with professionals who design mainstream educa-

tional technology and digital media, and who develop online learning platforms.

In addition to increasingly ubiquitous computing in daily living and the general classroom (Alexander, 2006; Billah, Ashok, Porter, & Ramakrishnan, 2017), accessible educational materials have expanded from paper formats to include digital text, images, and video. Similar to traditional print media, digital materials can be adapted for accessibility by the student or a trained staff member such as a teacher of visually impaired students, transcriber, or paraeducator. In addition, because peripheral tools and programs can render digital media accessible in any format for low vision or nonvisual (braille or auditory) access, a resource specialist or general education classroom aide or teacher can support delivery of digital media and allow the teacher to focus on students' braille and technology learning. This digital workflow refers to the design and delivery of digital-only materials which, when accessible, empowers a student to independently interact with information using any preferred sensory learning channel (visual, auditory, or tactile) at any given time.

Although the effective provision of accessible educational materials still depends on the collaboration of teachers of visually impaired students with the Individualized Education Program team, a digital workflow requires a wider network to support the necessary infrastructure. Additional partnerships might include district administrators, information technology and assistive technology staff, and technology developers. In these partnerships, the student can be provided with appropriate computing devices, individualized access to the Internet and relevant applications, and accessible software applications. As a result, teachers of visually impaired students must be able to express students' needs in a way that will be understood by each partner. The teacher essentially becomes a facilitator who must be able to talk to software developers, book publishers, web designers, and accessibility professionals in their own professional language while also teaching students how to access those environments and materials. As the professional with deep pedagogical knowledge of the learning needs of students with visual impairments, this teacher needs to be a decision maker among discussions about universal design, learning sciences, and computer-mediated technologies. As will be discussed in the section about the travel environment, teachers of visually impaired students need to be involved when learning environments are being designed and built so that they can be in a position to advocate for accessibility rather than remain in a constant state of reacting to poor designs and inaccessible materials. The nature of learning environments has changed, and preservice and in-service programs need to prepare teachers to make fundamental changes to their language and practices accordingly.

The Braille Transcriber as an Alternative Media Specialist

In a digital workflow, instruction created specifically for an individual student is still critical, but ancillary tasks such as the design and delivery of accessible educational materials might be outsourced to provide the teacher of visually impaired students with more collaboration time to facilitate duties among the school team. As indicated in the previous section, these materials are no longer limited to enlarged and brailled materials; they also encompass implementation of a digital workflow. Although educators continue to support translation of print materials for nonvisual or low vision access, other responsibilities must now include digital accessibility practices such as formatting digital text and inserting images or video descriptions into multimedia materials. When digital media are formatted for accessibility (WebAIM, n.d.), students can use their tool of choice

and access materials independently and at the same time as their peers.

Students will always need braille and tactile graphics, but the expanding scope of accessible educational materials means enhancing what and how materials can be provided to engage with information. This shift does not necessarily replace traditional instructional materials; rather, the inclusion of a broader range of media empowers students to be in charge of their own accessibility. Consultation with teachers of visually impaired students is needed to dictate which materials are put into the digital workflow, which are inappropriate for digital adaptation, and what formats these materials can be transformed into (such as accessible text, image descriptions, 3D models, and enhanced data visualizations) (Siu, 2016).

Although the teacher facilitates the digital workflow, other professionals can support the design and delivery of the content within the workflow (the accessible educational materials). In the primary and secondary school setting, transcribers who create braille materials and tactile graphics are strategically positioned to accomplish much of that work. They already work in the digital environment in order to create braille and large print materials. Now they must also excel in the digital workflow to accept digital information, ensure its accessibility, and provide it in varied formats to students.

The need for these materials has not changed, but the *role* of transcribers has expanded due to the advancement of learning media into the digital realm. Transcribers have become more than just braillists and must now act as alternative media specialists. This role requires transcribers to become more familiar with the accessibility and usability of various digital formats, and to understand the range of end user technologies and how these interact with different kinds of content.

The Orientation and Mobility Specialist as a Travel Liaison

Similar to how teachers of visually impaired students must understand the intricacies of new digital learning environments to support successful learning experiences and how braille transcribers must embrace the skill set of an alternate media specialist to support successful delivery of accessible educational materials, O&M specialists must understand modern physical environments to ensure successful travel experiences. The physical built environment has seen an increasing series of changes that seem to have accelerated in the last 20 years. Larger intersections with large turn radii accommodate increased traffic flow, wheelchair ramps and detectable warning surfaces are prevalent, and accessible pedestrian signals are more common. Intersections more frequently have channelized turn lanes, and new intersection geometries such as roundabouts and double-diamond interchanges are more common. A prevalent change to the modern travel environment is intersection actuation, where light phases change according to traffic flow. This phenomenon can cause confusion in pedestrians who are visually impaired when parallel traffic surges do not occur in the same sequence of traffic phases or are masked by other traffic movements. All these changes create travel environments that can be much less predictable than they were even 10 years ago.

In order to instruct people who are visually impaired to understand and travel well in the modern travel environment, O&M specialists must be familiar with details of how the built environment works. For example, they need to understand that, generally, a push-button must be pressed in order for the visual WALK sign to be lit or the audible message to be activated. Further, they need to understand that pushing a push-button generally will only activate the pedestrian facilities during the next applicable traffic phase, not immediately. When pedestrian facilities at an intersection are not

optimally accessible, an O&M specialist needs to know who to go to in order to adapt the environment. Changes to the length of a pedestrian walk phase, presence of accessible pedestrian signals, and properly installed detectable warnings are some common situations in which an O&M specialist might need to speak to a local traffic engineer. In order to do so efficiently, the O&M specialist must be familiar with standards for installation of accessible pedestrian signals and detectable warnings, how they might be adapted, and how to speak in the professional language of traffic engineers. Being able to cite relevant portions of the *Manual on Uniform Traffic Control Devices for Streets and Highways*, the manual that regulates the built environment, will aid in this dialogue (Federal Highway Administration, 2009).

When teaching pedestrians who are visually impaired to navigate the modern urban environment, O&M specialists must describe complex intersections, traffic situations, or signal timing to clients. They need to advocate for the rights of pedestrians who are visually impaired at traffic engineering meetings before changes are made to the built environment. As such, O&M specialists need to know about the environment, how it works, and how it can be changed; about clients' abilities and capacity for risk; and how to best match client abilities to environmental factors so that travel is optimized. O&M specialists must act as liaisons between the pedestrian and the travel environment by working both sides of the equation. They teach clients concepts and skills, including how to assess and understand the environment, and affect the environment by being involved in planning meetings where changes to the built environment are discussed.

One of the principal ways O&M specialists can be involved in designing the built environment is to become involved with the Transportation Research Board (TRB). This board is the professional organization of traffic engineers that researches how the built environment should be regulated and develops policy documents and implementation guidelines. Many changes in the built environment are developed at committee meetings of the TRB. If O&M specialists are present at those meetings, they can influence the environment instead of reacting to it. At a local level, O&M specialists need to communicate with their local traffic engineer to ensure that current policies and standards are implemented properly to optimize access to the built environment. Incorporating these strategies and vocabulary into O&M training programs is therefore just as critical as learning skills for instructing clients in O&M skills.

Discussion

In general, it appears necessary to update the conception of the roles of teachers of visually impaired students, braille transcribers, and O&M specialists due to changes in learning and travel environments. Although the scope of practice remains the same, the context in which services are delivered has changed. Vision professionals need to be more proactive rather than reactive and to better prepare colleagues and students in the field of visual impairment for the reality they will face in the school and work environment and the community at large. At first glance, these changing roles and responsibilities may seem like teachers of visually impaired students, braille transcribers, and O&M specialists have more on their plate than ever before. However, increased collaborations might more effectively support large caseloads by outsourcing certain tasks so professionals can focus more on direct instruction with students.

The changing roles of vision professionals emphasize access to information in digital learning and physical built environments. Addressing these realities may clarify the duties

of professionals and better disseminate the core mission of the field of visual impairment to potential stakeholders outside of the field. Better understanding of what it means to support students with visual impairments might mean better advocacy and inclusion of them in the greater community. These conceptual updates do not necessitate changes in how education and rehabilitation vision professionals are certified. They do not change the foundations of the practice of the field of visual impairment, but these changes do require innovation in preparation of educational vision professionals. They also require a broader understanding of tools and digital and built environments in order to collaborate with broader systems. Teachers of visually impaired students need a broader understanding of how mainstream and specialized technologies fit together, how technology fits into a digital workflow, and how to help students troubleshoot and advocate for improved accessibility practices. If braille transcribers are reimagined as alternate media specialists, they will remain a critical component in ensuring the design and delivery of accessible educational materials and replicate how learning materials are disseminated in higher education. This reimagination would allow teachers of visually impaired students to focus on helping students develop the technology skills to access work independently and become proficient technology users. O&M trainees need to be taught how the built environment works, how it is designed, and how to increase access to it. Personnel preparation programs need to teach all vision professionals to be collaborators. Young professionals in the field of visual impairment need to build habits for connecting with larger networks for informal professional development, focus on building and engaging in communities of practice to cultivate their knowledge, and engage with stakeholders from the disability community on best practices in accessibility. In summary, this approach means that collaboration time will increase, but direct service time might decrease if the learning and built environments are more readily accessible. In the ideal world, vision professionals can focus on developing students' skills to use the appropriate tools for information access rather than on remediating materials, concepts, and skills for single-use cases.

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