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# The Voices of Orientation and Mobility Specialists Who Instruct Individuals with Deafblindness

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## Abstract

Deafblindness is a combined loss of vision and hearing that significantly impacts individuals access to environmental and communication information. Despite the complexity of Deafblindness, limited research exists about how orientation and mobility specialists use instruction for their learners. This qualitative study explored instructional strategies, assistive technology, and supports orientation and mobility specialists use when teaching individuals with Deafblindness. Six certified orientation and mobility specialists with one to 40 years of experience participated in semi-structured interviews conducted via Zoom. Interview data were transcribed, coded, and thematically analyzed using a phenomenological approach. Four major themes: teaching strategies, communication, supports, and assistive technology/equipment emerged. Participants emphasized individualized instruction integrating tactile and kinesthetic methods, Protactile communication (a socio-political movement grounded in constant physical contact, co-presence, and a continuous stream of tactile information), and consent-based touch (Lu et al., 2025). Protactile was developed by people with DB, and is a combination of American Sign Language and touch (Morrison & Voight-Campbell, 2017). Communication strategies included tactile and visual sign language, communication cards, interpreters, and technology-facilitated methods such as relay software and braille displays. Supports included intervenors, co-navigators, interpreters trained in instructional techniques, and interdisciplinary collaboration. Assistive technology ranged from traditional canes and tactile maps to smartphone-based GPS and relay apps, with an emphasis on individualized, flexible applications. Findings underscore the need for orientation and mobility curricula to be modified for learners with Deafblindness, prioritizing multimodal communication, collaborative support, and adaptive use of technology. Implications include the importance of training orientation and mobility specialists in specific strategies and conducting future research involving direct observation and input from individuals who are Deafblind.

## Keywords

Deafblind, orientation, mobility, teaching strategies.

## Introduction

According to the National Center on Deafblindness (2025), Deafblindness (DB) "is a condition in which an individual has combined hearing and vision loss thus limiting access to both auditory and visual information" (para. 1). Deafblindness affects about 2.4 million people in the United States (National Family Association for Deafblind, n.d.). The World Federation of the Deafblind (2018) estimates the number of people who are DB worldwide is between 0.2% and 2%; the uncertainty reflects a lack of a standardised definition of DB worldwide. Due to a lack of widely used definition, there is a need for more research addressing the population of DB (Meekins-Doherty et al., 2025).

Many conditions can cause DB, ranging from Usher syndrome in children (prospective DB) to DB caused by the aging process (e.g., age-related hearing loss called presbycusis and age-related macular degeneration). The level of functional vision and hearing of people with DB is varied, ranging from slight to significant impairment (Bruce et al., 2018). This variation creates significant complications for the provision of orientation and mobility (O&M) services. People with DB may not solely rely on auditory and visual cues to navigate their environments (Sauerburger et al., 2024), whereas those with only visual impairment can focus on visual and/or auditory information for travel. In fact, Hersh (2016) reported they may have problems with interpreting and localizing sound. The traditional O&M curriculum may be modified to meet the needs of persons with DB (Sutherland & Tabb, 2021; Sauerburger et al., 2024). Common modifications O&M specialists teach to students with DB have included the use of a longer cane, constant contact rather than the two-point touch cane technique, calendar boxes, interpreters, tactile prompts, and use of assistive technology (AT) (e.g., communication card to assist with street crossing, GoBraille, tactile prompts; Okungu et al., 2025; Sauerburger et al., 2024).

Research concerning O&M for individuals with DB is limited (Okungu et al., 2020; Warnicke et al., 2022). This qualitative study based on interviews with six O&M specialists thus addresses a significant gap. It identifies instructional strategies and resources O&M specialists working with children and/or adults with DB use in their practice.

The research questions were:

1. What are the instructional strategies and equipment O&M specialists use when working with people with DB?

2. What additional supports do O&M specialists believe would improve their service to individuals with DB?

### Methods

#### Recruitment

Prior to conducting the study, the researchers obtained Human Subjects permission and ethics approval from Texas Tech University (See Figure 1 for the study's process). Letter of invitations were emailed to the Chief Executive Officers (CEOs) of professional organisations and rehabilitation centres offering O&M services to individuals with visual impairment and those individuals with DB; the former included the National Federation of the Blind, Association for Education and Rehabilitation of Blind and Visually Impaired, Orientation and Mobility Specialists Association, National Orientation and Mobility Certification, and the Council for Exceptional Children Division on Visual Impairments and Deafblindness, while the latter included Affiliated Blind of Louisiana, Fort Worth Lighthouse (Texas), Vibrant Works formerly San Antonio Lighthouse (Texas), Criss Cole Rehabilitation Center (Texas), Envision Dallas (Texas), Oklahoma Department of Rehabilitation, NewView Oklahoma, Lighthouse for the Blind in New Orleans, Louisiana Center for the Blind, Louisiana Association for the Blind, Low Vision Rehabilitation Center, Ensight, Curtis Strong Center for the Visually Impaired, Colorado Center for the Blind, AER-Newsletter, and Helen Keller National Center for DeafBlind Youth and Adults. Attached to the letter was a recruitment information sheet for emailing to their major listservs, which described the study and the researchers' desire to speak with O&M specialists who work with people with DB. Reminder emails containing the same recruitment information were sent to the above-mentioned organisations. These organisations were asked to

re-post the recruitment information 2–3 weeks after the original posting.

Fifteen potential participants contacted the researchers via email in response to recruitment, and nine people did not meet the selection criteria and so were excluded. Only six individuals signed consent forms and subsequently participated in 60-minute semi-structured interviews via Zoom, which were recorded with their permission. The recordings were transcribed by a video transcription company and then reviewed by research assistants for accuracy of the transcriptions compared to the original recordings. Pseudonyms were used to identify the participants and on transcripts. All participants were offered a $50 gift card from Amazon.

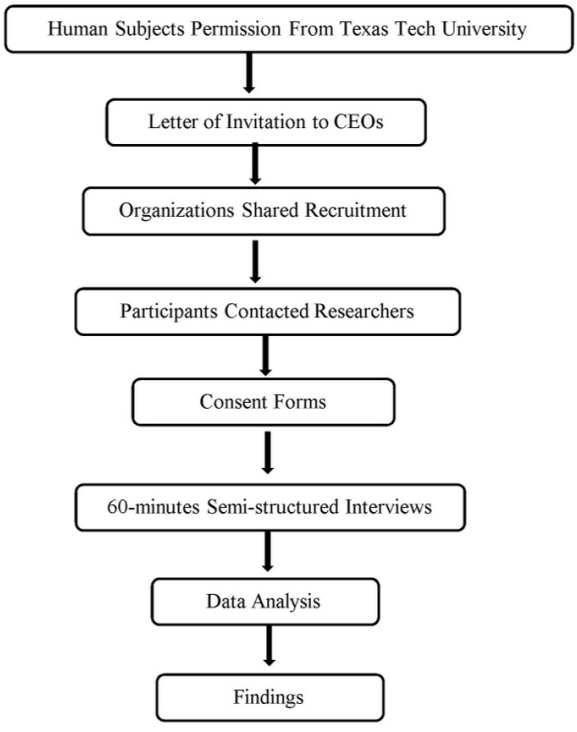


Figure 1. *The study's process*.

## Participants

Six qualified O&M specialists formed the study's participants. A description of the six participants is provided below. Pseudonyms were chosen by the researchers (See Table 1).

**Table 1**

*Description of Participants*

| Pseudonym | Length of Certification | Students' Group | Work Location | Typical Age of students |
|---|---|---|---|---|
| Catmandu | 43+ years | People with visual impairments/DB | School for the blind; rehabilitation centre | Not specified |
| Everest | 38+ years | People with DB | School for the blind; rehabilitation centre | Birth to adults |
| Jasmine | 1+ year | People with visual impairments/DB | School for the blind; rehabilitation centre | 14 years and older |
| Mountain | Less than a year | Adults with visual impairments/DB | Rehabilitation centre | 19 years and older |
| Siddarth | 29+ years | Children/adults with visual impairments/DB | School for the blind; rehabilitation centre | 3 years and older |
| Sitara | 11+ years | People with visual impairments/DB | School for the blind; rehabilitation centre | 14 to 97 years |

***Note.*** This table shows a selection of certified professionals, identified by pseudonyms, detailing their experience, their work location and their client age. DB = Deafblind.

## Research Design

Qualitative data gathering methods, which include interviews, observations, focus groups, and document or artifact analyses (Muzari et al., 2022), are commonly used in social sciences and other fields where subjective experiences and interpretations are of concern. As Muzari et al. (2022), have described, qualitative methods are suited to identifying human experiences, beliefs, attitudes, and behavior in their richness and depth, going beyond statistical analysis and garnering information that cannot be gathered from quantitative studies. Qualitative research supports the gathering of rich, descriptive data about participants' perspectives, experiences, and environments (Muzari et al., 2022). This study used a qualitative research design that allowed the researchers to study and understand complex trends and meanings.

The current study uses a phenomenological approach. Phenomenology is a framework that calls on researchers to use their own words, known as voice in the text, to eloquently or thoroughly describe the participants' real experiences (Aguas, 2022). Researchers employing this framework

typically use it to explore participants' interpretations and descriptions of their experiences and familiarities.

Interviews were used in this study as they are a purposeful conversation initiated by the researcher to gain in-depth insight of participants' experiences and viewpoints (Brinkmann, 2022). Interviews typically featuring open-ended questions that enable participants to express themselves significantly while remaining consistent with the research objectives. Interviewing is one of the most frequent among the various qualitative data-generation methods utilized methods since it offers insight into subjective, internal, and experiential aspects that are not directly observable (Brinkmann, 2022; Brinkmann & Kvale, 2025). Using direct quotes from participants is crucial in interview-based research as it improves transparency and maintains the genuine expression of participants' voices (Enriquez, 2024).

## Data Analysis

Once the interviews were transcribed verbatim (June to August 2025) this study's research team met on a weekly basis via Zoom to review the participants' transcriptions by reading and rereading through each transcript (Brinkmann, 2022). The research questions were utilized to identify and interpret participants' shared experiences. An Excel spreadsheet was used to collect pieces of evidence the team thought were non-repetitive statements. Codes were identified and themes/subthemes were named and described. The entries on the spreadsheet were also reviewed and revised based on the themes/subthemes that emerged. Notes were taken when there were questions about the participants' comments. In September–October 2025, member checks were completed with the participants to clarify some of these statements. Figure 1 depicts this process as well as the data analysis.

## Results

This section presents the key findings of the study based on the collected data. The themes/subthemes that emerged in the analysis included teaching strategies, communication, supports, and AT/equipment (See Table 2).

**Table2**

*Thematic Analysis of Findings*

| Research Questions | Themes | Sub-Themes |
|---|---|---|
| RQ1. What are the instructional strategies and equipment O&M specialists use when working with people with DB? | Teaching Strategies | hand-under-hand<br>consent for touch<br>Protactile<br>personalized exploration<br>modified guiding<br>sound training |
| | Communication as part of an instructional approach | tactile/visual signing<br>directional cues<br>mapping<br>environmental cues |
| | Assistive Technology/Equipment | cane types<br>tactile maps<br>braille displays<br>hearing technology<br>apps (GPS)<br>monocular<br>FM systems |
| | Supports | Interpreters<br>Intervenors<br>co-navigators<br>SSPs<br>trained interpreters<br>safety supports<br>modified human guiding techniques |
| RQ2. What additional support do O&M specialists believe would improve their service to individuals with DB? | Assistive Technology/Equipment | when participants describe AT that would enhance service or is currently insufficient |
| | Communication | Interpreters<br>backup methods<br>communication planning as a type of support |
| | Teaching Strategies | more training or additional instructional methods |

*Note.* The table shows the research questions with themes and subthemes based on findings.

## Teaching Strategies

The teaching strategies used by participants included obtaining consent to use hand-over-hand instruction, touch-based and kinesthetic strategies, and technology integration. Participants mainly focused on the importance of Protactile communication. Further, it was found that strategies need to be personalized to the individual, permitting learners to explore environments interactively rather than sequentially, reinforcing independence through collaborative exploration. Gaining consent to touch students was critical. The United States law, Individuals with Disabilities Act (2004), calls for an appropriate education. Specifically for children with DB to access communication and learning, a functional communication system is necessary, which involves touch. Discussion about where to

touch a student is called for to facilitate learning (e.g., tap right shoulder to indicate right turn).

The participants used modified guiding techniques such as having the person with DB hold guide's hand. They emphasized the importance of training in sound direction. For example, students often have difficulty identifying traffic patterns, especially if surroundings are complex or noisy. Teaching support was also customized to each learner's comfort with cane travel, as participants encouraged their students with DB to use the cane in a way that felt natural and safe. Orientation and mobility instruction included sound and visual cues, assessment of environmental noises, and teaching street-crossing safety techniques such as those from the Timing Method for Assessing the Detection of Vehicles (Sauerburger, 1993). Overall, these strategies focused on flexibility, sensory integration, and student engagement.

**Communication**

Communication methods frequently used included sign language (i.e., visual and tactile), communication cards, braille displays, and large text designed specifically for a particular student. Participants referenced using tools such as myMMX db® relay software, a videophone for people with DB. Computers for route planning or paratransit scheduling helped with daily navigation and planning tasks. For example, Siddhart said that they use myMMX db software

to communicate with…paratransit for scheduling. It's a relay software where the Deafblind person can sign, and then the interpreter types back their responses so that the Deafblind person can use it, read it on the braille display.

Everest, also an interpreter, mentioned the need to use another interpreter to facilitate communication between them and their students during O&M assessments:

If they are working with somebody such as an intervener or a co-navigator that they have a trusting relationship with and a strong communication, that's always gonna be a support…even with my signing ability, I always start evaluations [with people with DB] with a certified interpreter…so that I can ensure that…we aren't having communication breakdowns.

Participants described a wide variety of communication strategies they used during O&M lessons because of the sensory abilities, preferences, and situational needs of individuals with DB. Tactile using touch and Protactile methods (unique language practiced on the body and includes constant space, safe places to touch, tapping one's hand) (Webster, 2025) emerged as major components of communication, including Protactile signing, tactile symbols, hand-under-hand, and hand-over-hand signing, as well as print-on-palm and finger spelling in palm to convey messages through direct touch. To describe spatial layouts, provide traffic directions, or convey environmental information, specialists used directional touch cues and mapping on the back, arm, or leg, particularly for those with no vision or hearing.

American Sign Language (ASL) was frequently mentioned as a primary mode of interaction. Some participants stated that, depending on the individual's background and preferences, they adapted their signing to Signed Exact English or Pidgin Signed English. Tactile ASL was commonly used for individuals with little or no vision, and in many cases, interpreters—both in-person and remote interpreting for those with some vision — were integrated into the communication process.

Other strategies that played a vital role were visual and object-based strategies. Real objects and calendar systems were used to convey schedules, while drawings on the people's back helped illustrate concepts. Another effective method was pointing out pictures or menus, and participants often took photos with smartphones or tablets to facilitate this. Participants also described using environmental cues like changes in temperature, airflow, or lighting to provide orientation and context.

Technology facilitated written and text-based communication were also mentioned. For example, participants sent e-mails, used talk-to-text applications on cellular phones, sent braille messages, and sent texts with assistance from interpreters who would read messages and sign responses. Specifically, O&M instructors emailed routes to be travelled during lessons to interpreters so they could explain the routes to the students. Dictation tools and communication cards were used to facilitate the exchange of information with the broader public. Participants used auditory interventions such as personal amplifiers, increased volume speakers, and intentional communication in environments for those with residual hearing. Task analysis was utilized to reduce anxiety and offer

clarity for hard-of-hearing individuals who did not know sign language.

Participants stressed the significance of individualized communication aids to navigate in public settings such as route planning software, visual landmark identification, and non-verbal signals like waving to solicit assistance. Individuals with DB depended on co-navigators to support people who offered explicit environmental information, transportation aid, and situation awareness without interpretation. Most of the participants mentioned the importance of having a backup plan for unexpected communication problems in highly complex settings, like bus travel.

**Supports**

Supports participants mentioned included interpreters, intervenors, co-navigators, in-house translators, and Support Service Providers with the skills to help the people who are DB with daily living skills. Everest referenced that interpreters must be trained in effective instructional techniques. They said, “I will explain [the lesson] fully to the interpreter... so that they understand what we’re trying to teach, and then the interpreter can better explain instead of trying to keep up at the same time.” Participants implemented modified human guide support where students held the instructor’s forearm or hand for better tactile or visual access to signing.

**Assistive Technology/Equipment**

Participants reported that they use a variety of equipment and assistive technology (AT) to facilitate mobility, communication, and learning for people who are blind or DB. Among the AT they used to support teaching students with DB were a monocular and/or FM system, laminated communication cards, braille labels, relay services, bus tracking apps, and pen-and-paper tools using felt-tip markers. Mountain described their use of a monocular and/or FM system commenting: “I have a microphone on when I’m teaching, so it goes directly to their hearing aids…. [My student with DB] has three or four programs in her hearing aid[s] that she can adjust on her phone.” Some participants used the BuzzCard© app to support scripted communication in public settings, finding it particularly useful for English language speakers. Classroom teachers, teacher assistants, physical therapists, occupational therapists, parents and peers collaborated in the use of AT. For example, Catmandu stated, “My support[s] are the people that know the student best… the parents…. [S]ign language is the main thing I have on my phone an ASL dictionary app.” Participants mentioned that they developed their own AT for emergency preparedness for their DB students, including In Case of Emergency books, emergency binders, and laminated contact cards containing critical medical and communication information. They created larger photo-album-style emergency books for older adults with DB with information such as medication lists, allergies, preferred communication methods, and emergency contacts. Instructors also ensured that students carried backup chargers and other individualized emergency tools to remain safe and independent in the community.

Tactile maps, white canes (e.g., AmbuTech® canes, roller ball tips, and various cane types), walkers, scooters, and wheelchairs with canes, are also mobility aids most participants mentioned. The roller ball cane tip was described as a tool that provides directional information. Binoculars were also mentioned and are used for orientation. Technology was used extensively, including smartphones, braille displays, GPS-based apps (e.g., Google Maps©, Transit), video relay services, Internet Protocol Relay, and FaceTime© with captions. Hearing aids, cochlear implants, bone conduction headphones, headsets, Miniguide, and computers for making communication cards were also discussed.

Participants also stated the importance of responding to students’ individual preferences, teaching strategies that incorporate community-based practice, extra time for lessons, and incorporating student choice into activities. Backup plans were emphasized, such as packing battery chargers and having non-digital navigation aids in case the phone failed. Overall, the results stressed the importance of the use of traditional mobility tools, AT, and adaptable instructional methodologies to address the diverse needs of the people served.

**Discussion**

Six O&M specialists with experience ranging from less than a year to more than 40, teaching all ages of individuals with DB, were interviewed. They were employed in schools for the blind and/or rehabilitation centres for persons with visual impairment. Specifically, the researchers were interested in the identification of unique instructional strategies, equipment, and supports used by O&M specialists working with children and/or adults with

DB. Provided below are the themes that emerged from the study supported by relevant literature.

Participants mentioned many devices (e.g., communication cards, cochlear implants, object cues) that they use. Sauerburger et al. (2024) discussed the use of communication cards as a viable AT for communicating with the public. Similarly, Warnicke et al. (2022) identified strategies focused on O&M. They included use of assistance cards for crossing streets and AT (e.g., vibrotactility from eyeglasses with microphones and vibrators, cochlear implants, orientation technology giving directional cues, use of vibrotactile aid, Monitor® to assist with environmental perception, and use of the Miniguide and Breeze). Additionally, Parker (2009) identified effective O&M practices mentioned in 13 studies of people ages 8–36 with DB who had cognitive impairments and were residing in a residential facility and receiving O&M services published between 1965-2007. The O&M strategies that increased mobility varied from low tech (e.g., object cues) to high tech (e.g., portable electronic systems).

This study's finding that participants used tactile maps with their students with DB aligns with literature. Swobodzinski et al. (2021) stressed the use of tactile maps to assist people with DB for wayfinding. Likewise, in a review of studies of additive manufacturing, also known as 3D printing, and how it can improve the functioning level of people with DB, Bleau et al. (2022) encouraged the use of tactile maps for students with DB.

The curriculum needs to be modified for cultural differences. Sauerburger et al. (2024) stressed the need to "modify techniques to accommodate the hearing loss; the need to consider the learner's conceptual understanding of environments; and accommodate cultural differences, especially the Deaf culture" (p. 640). Jasmine stated,

I would say that I avoid the medical perspective when interacting with people who are deafblind…. [The] medical perspective is common in vision rehab[ilitation], but it is not common in Deaf culture. So, one of the ways that I adapt is by avoiding some of …the medical perspective terminology…when I'm interacting with people who are Deafblind. The perspective is different.... They don't believe they have anything…. It's not considered a disability. And they get offended and upset and say, "I don't like that person. I don't wanna work with them. They said I was impaired."

Sauerburger et al. (2024) also mentioned that communication is the primary issue when providing O&M to individuals who are Deafblind. Catmandu stated, "some students don't have sign language, so, you have to use other ways to communicate. … the techniques are always the same as how you teach it to the student in terms of…communication. I mean, it all comes down to that." Similarly, Rowland et al. (1995) and Sauerburger et al. (2024) discussed the use of tactile cues, touch cues, object cues, tangible symbol systems, augmentative systems (use of tactile or visual symbols like pictures), real objects, and multiple systems with individuals with DB.

Assistive technology (e.g., BuzzCard© app, talk-to-text applications, Transit app) that facilitate communication between O&M specialists and students with DB has been developed (Sauerburger et al., 2024). When developing new AT, it is important that app developers partner with end users who are DB to obtain their perspective (Okungu et al., 2025; Parker et al., 2020).

**Implications for Practice**

This study has a range of implications for professionals. O&M specialists who have never served individuals with DB should be ready to support these students. According to Catmandu, "You just have to get in there and do it…not to be afraid." Initially, they should become familiar with their students' primary method of communication and modify the traditional O&M curriculum to accommodate the student. Additionally, practitioners need to use evidence-based strategies, be willing to engage in future research, and publish their successful teaching strategies in journals like *The New RE:view*.

**Limitations**

One of the main limitations of this research study is the small sample size. When sample sizes are too small, there is a risk of not gathering enough data to support the research, and the small size reduces the transferability of findings to broader populations (Fowler & Lapp, 2019). Deafblindness is a low-incidence disability condition; therefore, a small

sample size of six participants is acceptable as it allows for thick descriptions (Subedi, 2021).

The interview was conducted using the Zoom online application, which is another limitation of this study. The use of Zoom may have restricted the researcher's ability to observe participants' nonverbal cues and body language, as in face-to-face interviews there are gestures, posture, and facial expressions that often give valuable context that helps in data interpretation. This limitation may have affected the depth of understanding and rapport building (Sullivan, 2012).

The fact that three members of the research team are O&M specialists is another drawback of this research. While valuable for interpreting data, this professional expertise may produce preexisting assumptions about the topic and potentially influencing how participants' responses are understood or framed. Such subject expertise can shape both data collection and analysis and might be affecting the objectivity of the study (Berger, 2015).

**Conclusion**

Interviewing O&M specialists who teach individuals with DB provided instructional strategies and resources involving AT, modifications to O&M techniques to better meet this population's travel needs, supports, and communication methods. The participants stressed the importance of modifying the O&M curriculum for people with DB and being willing to serve these individuals even though the O&M specialist may lack experience and confidence. Future research based on observation of O&M lessons for people with DB to document what unique instructional strategies, equipment, and supports are taught in the field and interviewing people with DB about the O&M services they receive as well as those services' effectiveness is warranted.

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