Listening to Learn: Strategies and Modifications for Children with Hearing Loss in the Classroom Environment

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Disclosure Statement

• The presenters are employees of The University of Southern Mississippi.
• We have no other financial or non-financial disclosures.
Incidence of Hearing Loss in Children

• Hearing loss in the most common congenital anomaly

• Between 2-4 babies in 1000 are born with some degree of hearing loss*

• An additional 4000-6000 children will have late onset loss
How We Hear & Types of Hearing Loss

Anatomy of the Ear

- Ossicles:
  - Stapes
  - Incus
  - Malleus

- Temporal bone
- Semicircular ducts
- Vestibular nerve
- Cochlear nerve
- Cochlea

- Auditory canal
- Eardrum
- Tympanic cavity
- Auditory tube

Outer ear
Middle ear
Inner ear
Degrees of Hearing Loss
Types of Amplification

• Hearing Aids

• Cochlear Implants

• Bone Anchored Implants
Hearing Aids

- Amplify sounds
- Components:
  - Microphone
  - Digital Signal Processor
  - Receiver
  - Ear mold
  - Battery compartment
Cochlear Implants

- Cochlear implants bypass the damaged hair cells and directly stimulate the auditory neurons electrically.
How is a Cochlear Implant Different than a Hearing Aid?

• Hearing Aids:
  – acoustically amplify sound
  – rely on the responsiveness of hair cells

• Cochlear Implants:
  – bypass damaged hair cells
  – stimulate auditory nerves directly through the application of external electrical current
Bone Anchored Implants
FM Systems

• Helps improve signal to noise ratio in a variety of noisy environments

• Components:
  – Transmitter
  – Receiver

• Types:
  – Personal
  – Soundfield
  – Desktop
Who To Call for HELP!

• Audiologist
• Hearing Aid Companies
  – Phonak
  – Oticon
  – Starkey
  – Unitron
• Cochlear Implant Companies
  – Cochlear Americas
  – Advanced Bionics
  – MED-EL
• Teacher of the Deaf
Developing a Successful Plan
Impact of Hearing Loss

• Speech Perception
• Auditory Skill Development
• Social and Conversational Competence
• Self Concept
• Self-Advocacy
Speech Perception

• How accurately can the student perceive speech when it is quiet? Loud?
• Noise and Acoustics
• Audibility vs Speech Understanding
• *Functional Listening Evaluation*
Effects of Noise on Hearing in Classroom

Noise masks speech sounds

- Often resulting in increased social-emotional problems
- Leading to decreased speech perception
- Leading to reduced academic achievement
- Leading to decreased comprehension

Auditory Skill Development

THE MISSING PIECE

• Not just receptive language
  – Identification
  – Discrimination
  – Auditory closure
  – Sequencing
  – Answering questions
  – Listening for details in story
  – Auditory memory
  – Conversation
Social and Conversational Competence

• Common problems
  – Inappropriate topic shifts
  – Frequently repeating
  – A non-flowing speaking style
  – Vocabulary
  – Jokes
  – Idioms & figurative language

• Theory of Mind

• Need to practice interaction skills in a social setting
Other Things to Consider

• Self-Concept
• Self Advocacy
• Academics and Reading
  – All areas discussed can impact academic success
  – IEP goals should emphasize each to create a well rounded and successful graduate
Schools are required to ensure that communication for students who are deaf and hard of hearing “are as effective as communication for others” [ADA Title II 28 C.F.R. 35.160 (a)(1)] through the provision of appropriate aids and services “affording an equal opportunity to obtain the same result, to gain the same benefit, or to reach the same level of achievement as that provided to others” [ADA Title II 28 C.F.R. 35.130 (b)(1)(iii)] and “to participate in and enjoy the benefits of the district’s services, programs, and activities” (DOJ-DOE p14)
FM Systems
Personal FM vs. Soundfield

Simulation Video
Communication Access

- Use of captioned video media
- Full access to computer audio by inputting FM transmitter into auxiliary access port
- Full access to school assemblies
- Full access to daily school announcements
FM System Strategies

• Correct placement of microphone
• Remember to mute when helping others
• Eliminate clothing or jewelry from scratching the microphone
• Talk naturally without raising your voice or exaggerating mouth movements
• Regularly test that the personal FM system is working
• Guest speakers should wear the microphone
• Use a pass around microphone for classroom discussion
Strategies to Allow Students Full Access to Curriculum
Controlling the Environmental

- Closer to the speaker
- Same level as the child
- Sit beside the child (best hearing side)
- Preferential seating
Improving Acoustical Conditions

• Decrease background noise/reverberation
  – Use suspended acoustical tile for ceiling
  – Close the door/windows
  – Tennis balls on chairs
  – Rugs/carpet
  – Heavy curtains to cut noise from outside
  – Turn off machines (i.e. copier, SMART board, fans) when not in use
  – Minimize the time students are retrieving materials
  – Use cork board on walls for bulletin boards
Strategies for the Classroom Teacher

• Write on the board and then turn and talk
• Identify student you are calling on by name
• Repeat, restate, and summarize statements during class
• Obtain attention
• Avoid chewing gum, putting papers in front of face, keep beard/mustache trimmed
Strategies for the Classroom Teacher

• One person speaking at a time
• Allow process time after asking question
  – 8-10 seconds
• Check comprehension
  – Use open ended questions
  – Do not use “Yes/No” questions
• Write important information on the board i.e. page numbers, assignments, homework
• Set up a signal from student to identify he/she does not understand
Developing Listening Skills for Younger Children
Strategies for Developing Listening Skills

• Repetition
• Pausing
• Waiting
• Modeling
• Not too loud
• Do not over articulate
Strategies for Developing Listening Skills

• Re-evaluate set size e.g. open/closed, large/small
• Take “IT” out of vocabulary
• Lowlighting (whispering)
• Sabotage
• Known to unknown
• Follow child’s lead
# Acoustic Highlighting

<table>
<thead>
<tr>
<th>More Salient for Beginning Child</th>
<th>Less Highlighting for Child Listening Well</th>
</tr>
</thead>
<tbody>
<tr>
<td>No background noise</td>
<td>Background noise (music, white noise)</td>
</tr>
<tr>
<td>6 inches from ear</td>
<td>Increase distance</td>
</tr>
<tr>
<td>Slightly slower rate</td>
<td>Normal rate</td>
</tr>
<tr>
<td>Increase pitch and rhythm variation</td>
<td>Normal pitch and rate</td>
</tr>
<tr>
<td>Clear speech/familiar voice</td>
<td>Unfamiliar voice</td>
</tr>
<tr>
<td>Acoustic contrast (vary vowels, # of syllables)</td>
<td>Less variation (minimal pairs, same syllables)</td>
</tr>
<tr>
<td>Shorter phrases</td>
<td>Complex language</td>
</tr>
<tr>
<td>Emphasis on key words or sounds</td>
<td>No emphasis</td>
</tr>
<tr>
<td>Emphasis on function words</td>
<td>No emphasis</td>
</tr>
<tr>
<td>Word position in sentence</td>
<td></td>
</tr>
<tr>
<td>End of sentence</td>
<td>Beginning</td>
</tr>
<tr>
<td>Closed set</td>
<td>Open set</td>
</tr>
</tbody>
</table>
Individualized Education Program
IEP

Modifications & Accommodations

• Modifications
  – Change in what is being taught to students or what is expected from the student

• Accommodations
  – Change that helps a student overcome or work around the disability or learning challenge

• Modification & Accommodation most often made in the following areas:
  – Scheduling
  – Setting
  – Materials
  – Instruction
  – Student response
IEP Modifications for Children with Hearing Loss

• Evaluation Modification
  – Reduce quantity on test
  – Use alternative tests
  – Allow extra time

• Curricular Modifications
  – Modify reading assignments
IEP Accommodations for Children with Hearing Loss

• Physical Environment Accommodations
  – Noise reduction (carpet, tennis balls)
  – Flashing fire alarm

• Instructional Accommodations
  – Captioning or scripts for announcements
  – Access to auditory input from computers, laptops, SMART boards, etc
  – Amplification check (daily)
  – Ling Six Sound Test (daily)
  – Pre-teach concepts

• Communication Accommodations
  – Specialize seating arrangements
  – Frequently check for understanding
  – Allow extra time for processing
  – Note taker
IEP Related Services

Teacher of the Deaf Responsibilities

• Provide in-services for school staff
• Evaluate classroom needs
• Listening check
• Monitor audiological management
• Support student in developing self-advocacy and socialization
### Hearing Itinerant Service Rubric

<table>
<thead>
<tr>
<th></th>
<th>5</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. FOLLOWING CLASSROOM ROUTINES:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Student appears unaware of classroom routines.</td>
<td>Student follows classroom routines with adult assistance.</td>
<td>Student follows classroom routines by prompting.</td>
<td>Student follows classroom routines independently.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>2. COMPREHENSION OF CLASSROOM INSTRUCTIONS:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Student does not comprehend instruction.</td>
<td>Student appears to understand information that is familiar and highly structured.</td>
<td>Student appears to understand information presented in a familiar context and fairly structured.</td>
<td>Student appears to understand most information presented.</td>
<td>Student appears to understand all information presented.</td>
<td></td>
</tr>
<tr>
<td><strong>3. PARTICIPATION IN WHOLE-CLASS LESSONS:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Student is disengaged.</td>
<td>Student does not respond when called on.</td>
<td>Student will answer when called on but response is off-topic.</td>
<td>Student volunteers and enriches the discussion.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>4. PARTICIPATION IN SMALL GROUP DISCUSSION/COOPERATIVE LEARNING:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Student is disengaged.</td>
<td>Student is attentive initially but does not participate.</td>
<td>Student is attentive but participation is not productive.</td>
<td>Student participates consistently and constructively.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>5. ACADEMIC PERFORMANCE IN READING, WRITING AND MATH:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Student is more than 3 years below grade level in Reading.</td>
<td>Student is 3 years below grade level in Reading.</td>
<td>Student is 2 years below grade level in Reading.</td>
<td>Student is Within 1 year of grade level in Reading.</td>
<td>Student is at or above grade level in Reading.</td>
<td></td>
</tr>
<tr>
<td>Student is more than 3 years below grade level in Writing.</td>
<td>Student is 3 years below grade level in Writing.</td>
<td>Student is 2 years below grade level in Writing.</td>
<td>Student is Within 1 year of grade level in Writing.</td>
<td>Student is at or above grade level in Writing.</td>
<td></td>
</tr>
<tr>
<td>Student is more than 3 years below grade level in Math.</td>
<td>Student is 3 years below grade level in Math.</td>
<td>Student is 2 years below grade level in Math.</td>
<td>Student is Within 1 year of grade level in Math.</td>
<td>Student is at or above grade level in Math.</td>
<td></td>
</tr>
</tbody>
</table>

Created by Lori Degman and the Special Education District of Lake County Hearing Itinerant Program
<table>
<thead>
<tr>
<th>Hearing Itinerant Service Rubric</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>6. LANGUAGE SKILLS:</strong></td>
</tr>
<tr>
<td>Student's Receptive Language is more than 3 years below age level.</td>
</tr>
<tr>
<td>Student's Expressive Language is more than 3 years below age level.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>7. SELF-ADVOCACY SKILLS:</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Student is unaware of hearing-related needs.</td>
</tr>
<tr>
<td>Student does not know the most advantageous place to sit</td>
</tr>
<tr>
<td>Student does not visually attend to the speaker.</td>
</tr>
<tr>
<td>Student does not know when information is misunderstood.</td>
</tr>
</tbody>
</table>

Created by Lori Degman and the Special Education District of Lake County Hearing Itinerant Program
### Hearing Itinerant Service Rubric

#### 8. AUDITORY SKILLS:
- **5**
  - Student does not demonstrate auditory skills at varying distances in a quiet classroom.
- **4**
  - Student demonstrates auditory skills at varying distances in a quiet classroom.
- **3**
  - Student demonstrates auditory skills at varying distances in a classroom with a normal noise level.
- **2**
  - Student demonstrates auditory skills at varying distances in a noisy classroom.
- **1**
  - Student demonstrates auditory skills in the presence of a verbal distraction.

- **Student does not follow auditory directions.**
- **Student follows auditory directions with repetition/adult assistance.**
- **Student follows auditory directions with prompting.**
- **Student follows auditory directions by observing others.**
- **Student follows auditory directions independently.**

#### 9. HEARING LOSS:
- **Profound Bilateral**
- **Severe Bilateral**
- **Moderate Bilateral**
- **Mild Bilateral**
- **Unilateral or Fluctuating**

#### 10. GRADE:
- **Pre-K - 1st**
- **2nd - 3rd**
- **4th-6th**
- **7th - 8th**
- **9th - 12th**

**TOTAL:** 

- **17 - 21 = No Services**
- **22 - 36 = Consult**
- **37 - 52 = Direct once weekly**
- **53 - 68 = Direct twice weekly**
- **69 - 75 = Direct twice+ weekly**
- **76 - 85 = Self - Contained**

**AMPLIFICATION:**
- ____ Cochlear Implant
- ____ Hearing Aid(s)
- ____ FM Unit
- ____ Soundfield

**OTHER CONSIDERATIONS:**


**PLACEMENT DETERMINATION:**

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IEP
Support for Personnel

• Attending a conference or training related to the child’s needs
• Getting help from another staff member or administrative person
• Having an aide in the classroom
• Getting special equipment or teaching materials
IEP Goals

- Functional Listening Skills
- Social & Communicational Competence
- Communication Repair
- Self-Concept
- Self-Advocacy
# Functional Listening Skills on the IEP

<table>
<thead>
<tr>
<th>Skill Area</th>
<th>Area</th>
<th>Standard</th>
<th>Objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Follows one-step to multi-step directions in noise/quiet</td>
<td>Language K-5</td>
<td>Identify real-life connections between words and their use (e.g., note places at home that are cozy)</td>
<td>Presented with a set of objects, the student will manipulate the object to match the (one, two, three) part directive with 80% accuracy as measured by teacher observation.</td>
</tr>
<tr>
<td>Identifies a pictures from a verbal description in noise/quiet</td>
<td>Reading K-5</td>
<td>Ask and answer questions about key details in a text read aloud or information presented orally or through other media.</td>
<td>After listening to text read aloud which describes an object/situation with 80% accuracy as measured by teacher observation.</td>
</tr>
</tbody>
</table>

Social & Conversational Competence

Pragmatic Rules of Conversation

- Turn taking
- Staying on topic
- Proximity to others
- Nonverbal cues
- Introducing topics of conversations
- Rephrasing when not understood
# Social Skills on the IEP

<table>
<thead>
<tr>
<th>Skill Area</th>
<th>Area</th>
<th>Standard</th>
<th>Objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shares toys or materials by requesting, turn</td>
<td>Speaking &amp; Listening K-5</td>
<td>Ask and answer questions in order to seek help, get information, or clarify something that is not understood</td>
<td>During a 5 minute free play session, the student will share a toy by requesting to do so at least 4/5 opportunities without prompting measured by teacher observation</td>
</tr>
<tr>
<td>taking, accepting or acknowledging</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Initiates positive interaction with peers</td>
<td>Speaking and Listening K-5</td>
<td>Speak audibly and express thoughts, feelings, and ideas clearly</td>
<td>During a 5 minute free play, the student will initiate a conversation with a peer by using an intelligible and appropriate greeting in 4/5 opportunities as measured by teacher observation</td>
</tr>
</tbody>
</table>

# Conversational Competence on the IEP

<table>
<thead>
<tr>
<th>Skill Area</th>
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<th>Objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Takes turns within conversation</td>
<td>Speaking &amp; Listening K-5</td>
<td>Follows agreed-upon rules for discussions (e.g. listening to others with care, speaking one at a time about the topics and texts under discussion)</td>
<td>During a 3 minute conversation with a peer, the student will take turns sharing ideas or information at least 2 times measured by teacher observation</td>
</tr>
<tr>
<td>Produces clear descriptions that relate two or more dimensions incorporating a variety of descriptive terms</td>
<td>Speaking and Listening K-5</td>
<td>Speak audibly and express thoughts, feelings, and ideas clearly</td>
<td>When presented with a picture of interest, the student will provide three or more descriptive details in 2 minutes as measured by teacher observation</td>
</tr>
</tbody>
</table>

Communication Breakdowns

Environmental Characteristics
• Proximity of speaker and listener
• Background noise

Speaker Characteristics
• Intensity of speaker (soft/loud)
• Speaker has an accent

Listener Characteristics
• Listener doesn’t perceive what is actually said
• Listener may not have access to the entire speech spectrum and parts of words are missing
## Communication Repair on the IEP

<table>
<thead>
<tr>
<th>Skill Area</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Shares toys or materials by requesting, turn taking, accepting or acknowledging</td>
<td>Speaking &amp; Listening K-5</td>
<td>Ask and answer questions in order to seek help, get information, or clarify something that is not understood</td>
<td>During a 5 minute free play session, the student will share a toy by requesting to do so at least 4/5 opportunities without prompting measured by teacher observation</td>
</tr>
<tr>
<td>Initiates positive interaction with peers</td>
<td>Speaking and Listening K-5</td>
<td>Speak audibly and express thoughts, feelings, and ideas clearly</td>
<td>During a 5 minute free play, the student will initiate a conversation with a peer by using an intelligible and appropriate greeting in 4/5 opportunities as measured by teacher observation</td>
</tr>
</tbody>
</table>

Self-Concept Development

“...self as a social product, developing out of interpersonal relationships and striving for consistency.”

(Anderson, K. & Arnoldi, K., 2011)
# Self-Concept on the IEP

<table>
<thead>
<tr>
<th>Skill Area</th>
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<th>Standard</th>
<th>Objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can explain the hearing loss and its impact in typical environments</td>
<td>Speaking &amp; Listening K-5</td>
<td>Report on a topic or text, tell a story, or recount an experience with appropriate facts and relevant, descriptive details, speaking clearly at an understandable pace</td>
<td>During a presentation to an adult the student will explain his hearing loss with 80% accuracy as measured by teacher observation</td>
</tr>
<tr>
<td>Utilizes the adaptive/assistive equipment necessary to make academic progress</td>
<td>Speaking and Listening K-5</td>
<td>Integrate information presented in different media or formats (e.g. visually, as well as in words to develop a coherent understanding of a topic or issue quantitatively)</td>
<td>On a daily basis, the student will complete the following maintenance activities in 4/5 days as measured by the teacher checklist (put on hearing aids, clean them, complete listening check)</td>
</tr>
</tbody>
</table>

## Self-Advocacy

<table>
<thead>
<tr>
<th>Skill Area</th>
<th>Area</th>
<th>Standard</th>
<th>Objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chooses own seat to maximize visual and auditory access.</td>
<td>Speaking and Listening K-5</td>
<td>Ask and answer questions in order to seek help, get information or clarify something that is not understood.</td>
<td>During a typical classroom activity, the student will seat himself to maximize his auditory and visual input in 4 out of 5 situations as measured by teacher observation.</td>
</tr>
<tr>
<td>Gives the FM transmitter to the speaker</td>
<td>Speaking and Listening K-5</td>
<td>Integrate information presented in different media or formats, as well as in words to develop a coherent understanding of topic or issue</td>
<td>During a transition to another classroom, the student will present the transmitter to the next teacher in 4/5 opportunities, 4 out of 5 days per week as measured by the teacher.</td>
</tr>
</tbody>
</table>

Web Resources

• Functional Listening Evaluation
• Activities for Listening an Learning (ALL)
  http://successforkidswithhearingloss.com/
• Auditory Learning Guide (ALG)
  https://www.pinterest.com/pin/129197083033602393/
• IEP Accommodations Worksheet
  http://www.deafed.net/PublishedDocs/IEP%20Checklist%202007.pdf
• Cochlear Americas’ Hope Online
  http://hope.cochlearamericas.com/online-courses
• Advanced Bionics’ The Listening Room
  http://thelisteningroom.com/
• Cottage Acquisition Scale for Listening, Language, and Speech
  http://www.sunshinecottage.org/index.php/educational_products/
References


