

Introducing Oticon EduMic

Enhancing the
classroom
experience



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Oticon Learning & Development

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Speaker disclosure

► Relevant financial relationships:

Candace Depp is an employee of Oticon, Inc. and receives a salary

► Relevant nonfinancial relationships: None



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Learner Objectives

- ▶ Participants will be able to recognize the acoustic challenges of children with hearing loss in the classroom.
- ▶ Participants will be able to describe how an unprecedented signal processing technology can provide better conditions for speech understanding in the educational setting.
- ▶ Participants will be able to list research to support the design and ease-of-use preferences towards Oticon's latest educational solution.
- ▶ Participants will be able to describe the full portfolio of educational solutions offered by Oticon.



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Speech and language development is one of the most important development processes during childhood



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“For most children with hearing loss, the early and appropriate selection and use of amplification is the single most important habilitative tool available to us”
-Mark Ross



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Goals in amplification



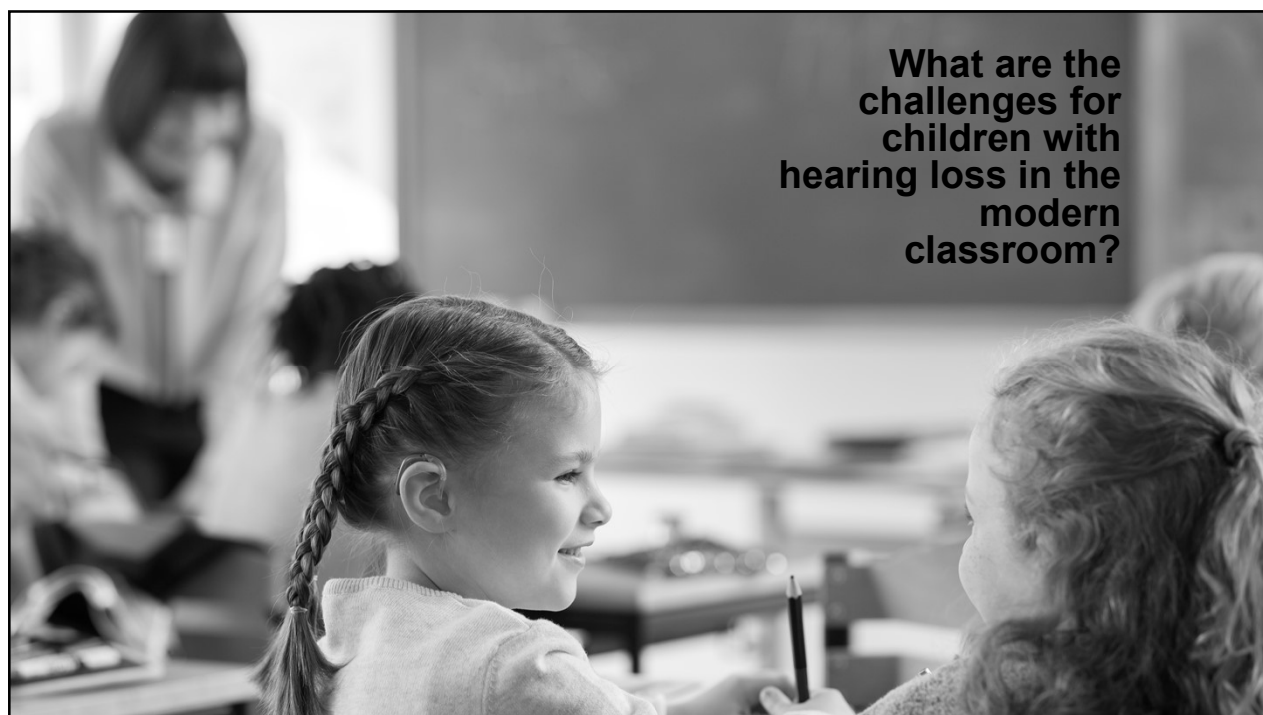
The goal of amplification is to provide an infant or child with impaired hearing the opportunity to have access to as much of the auditory environment, and in particular speech, as feasible.

American Academy of Audiology, 2013

 Oticon
BrainHearing™
Technology



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It's a real struggle in the classroom

Learning and development



Noise **masks** the most **important** acoustic **information** for speech perception

(Crandell & Smaldino, 2002)



Children have **less-well developed** language and communication systems

(Johnson, 2000)

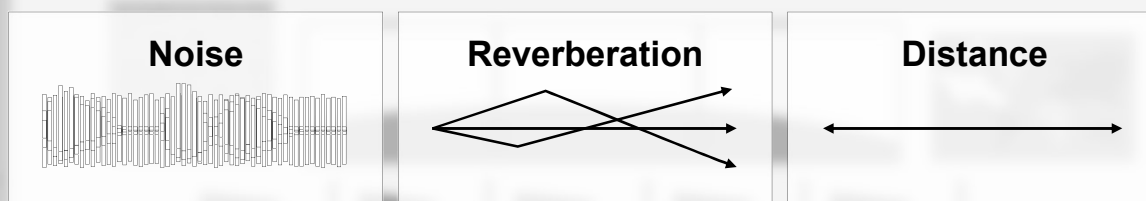
Children with a hearing loss need a **minimum + 15 dB SNR**

(Crandell & Smaldino, 2002; ANSI, 2010)



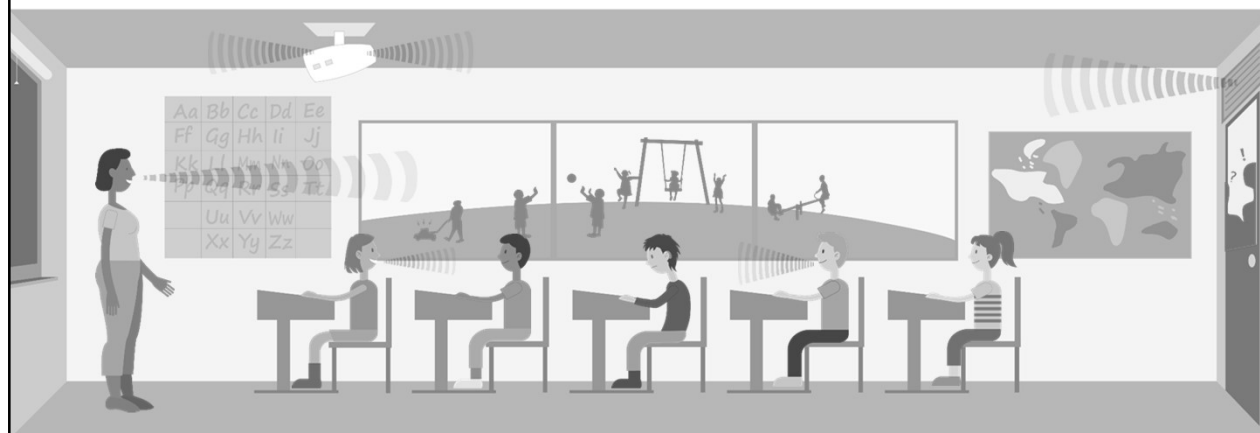
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What are the learning barriers in the classroom?



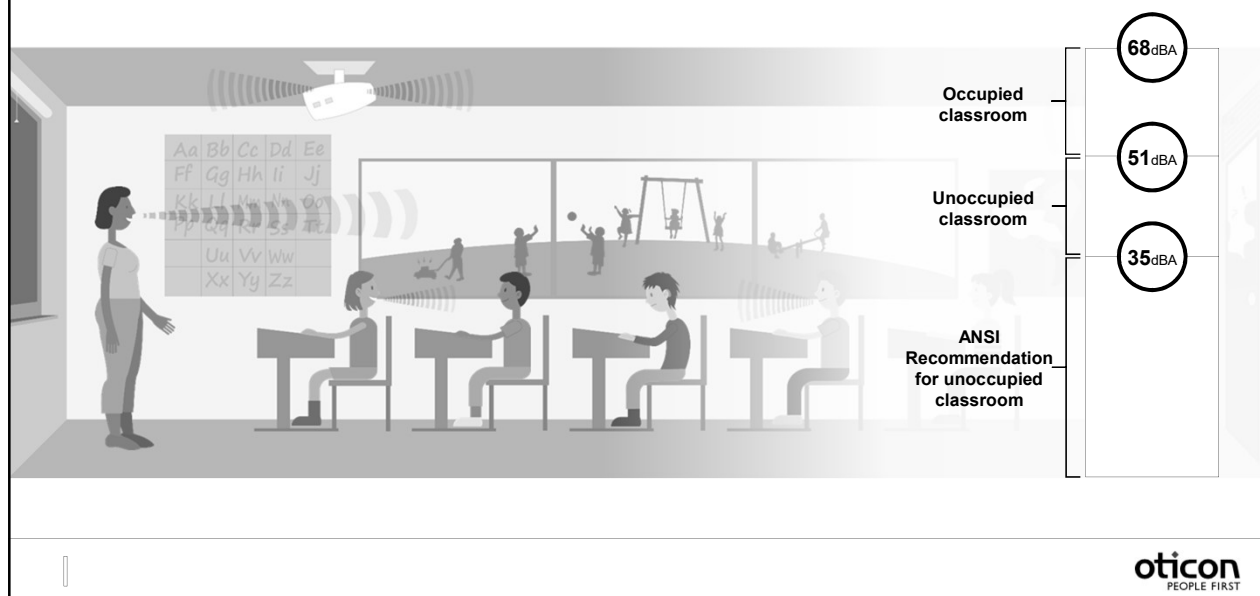
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Background noise

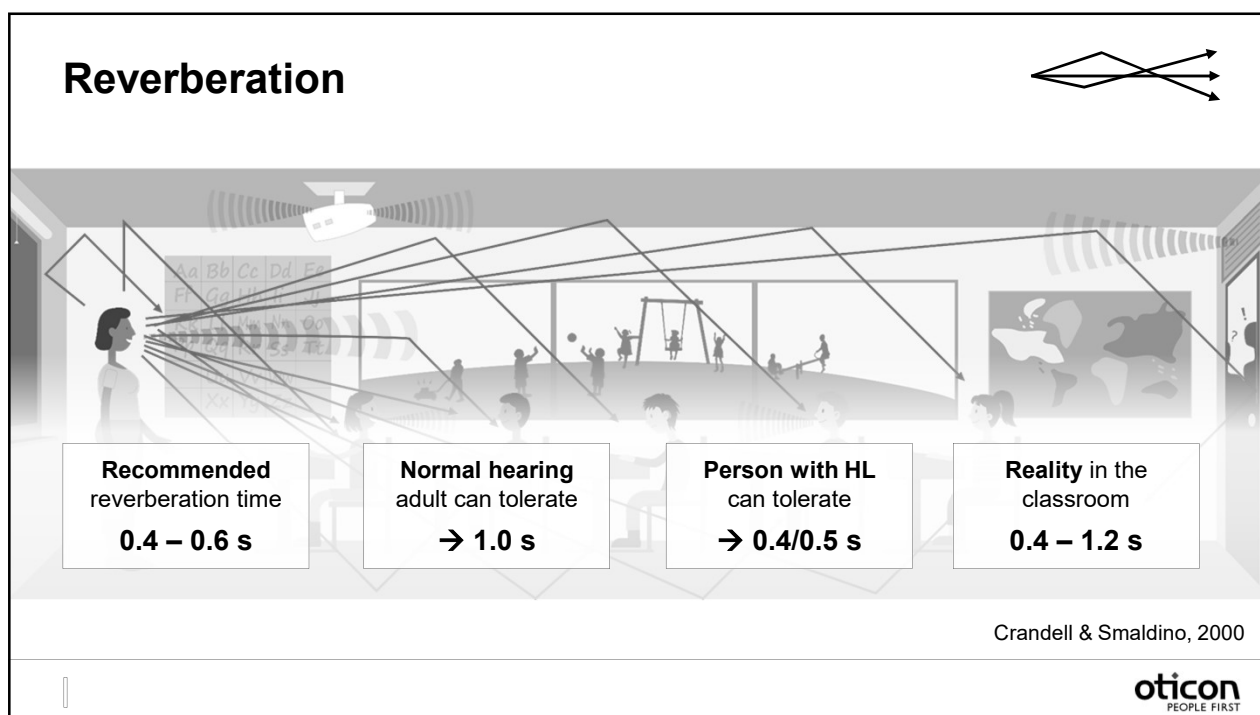


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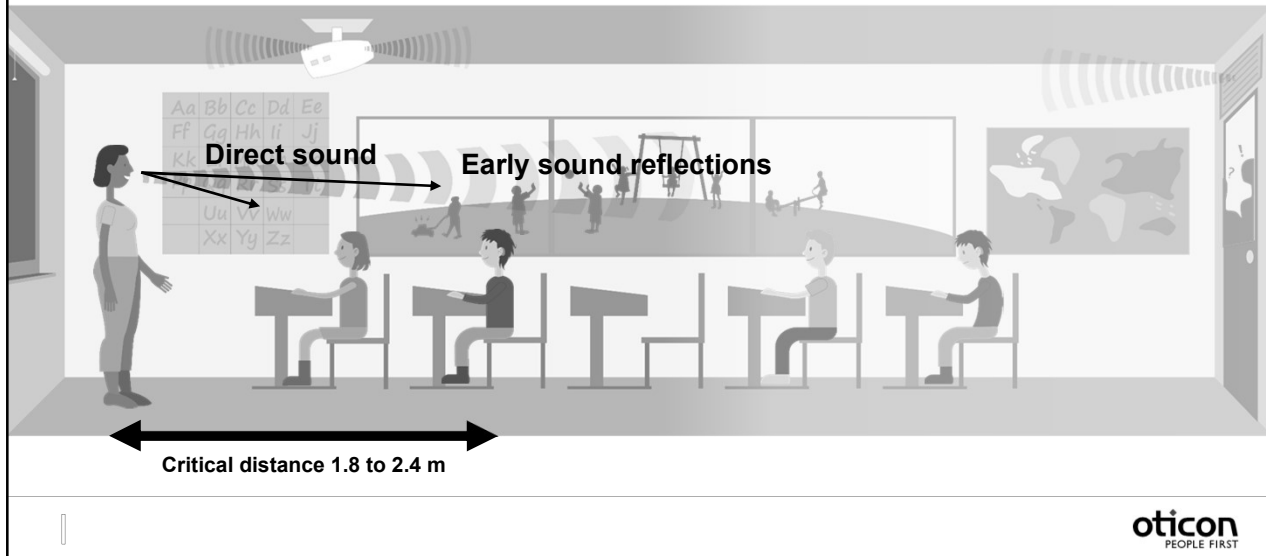
Background noise



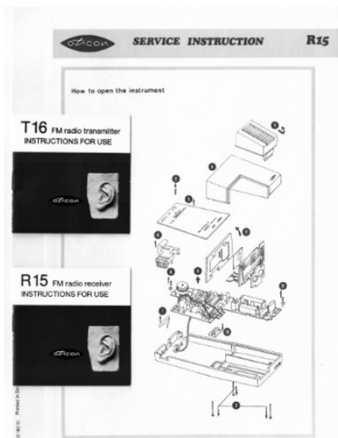
Reverberation



Distance



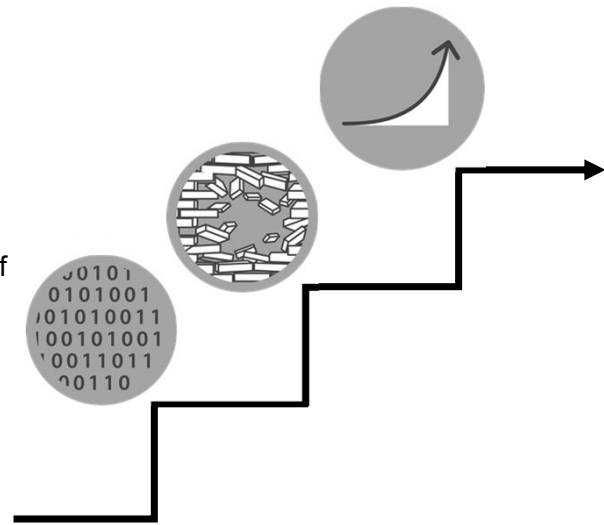
Oticon's legacy



Where are we headed?

Continuing the legacy

- ▶ Pushing the limits of signal processing – Brainhearing™
- ▶ Preparing a technology that could utilize the amazing power of Velox S and processing of OpenSound Navigator™
- ▶ Exploring the barriers to consistent remote microphone use
- ▶ Re-imagining the design and functionality of remote microphone technology



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Remote Microphone Use

- ▶ Remote microphone systems (RMS) have been successfully used with individuals with hearing loss for over thirty years.
- ▶ Because speech is picked up by the microphone placed close to the speakers mouth, a favorable SNR is created.
- ▶ Research shows that the use of RMS contributed to student learning and enhanced behavior and attention.



Remote Microphone Use

- ▶ When RMS were worn by the parent or caregiver in the home, children with hearing loss had access to about 42% more talk of their parents or caregivers.

Benitez-Barrera, Anglely, & Tharpe, 2017



Building Evidence Supporting the Use of Remote Microphone for Children and Teens with Hearing Loss

- ▶ Tween and Teen Focus Group (November 2017)
- ▶ Canadian Field Study: Toronto District School Board and Edmonton Public School Board (October and December 2018)
- ▶ Cincinnati Children's Hospital (April 2019)



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If you could create an FM, what would it look like and what are the things it could do?

- ▶ Small, I could hold it in my hand.
- ▶ Easy to use; my teachers sometimes forget how to turn it on.
- ▶ Fast charge – in case I forget to charge it.
- ▶ Good sound quality



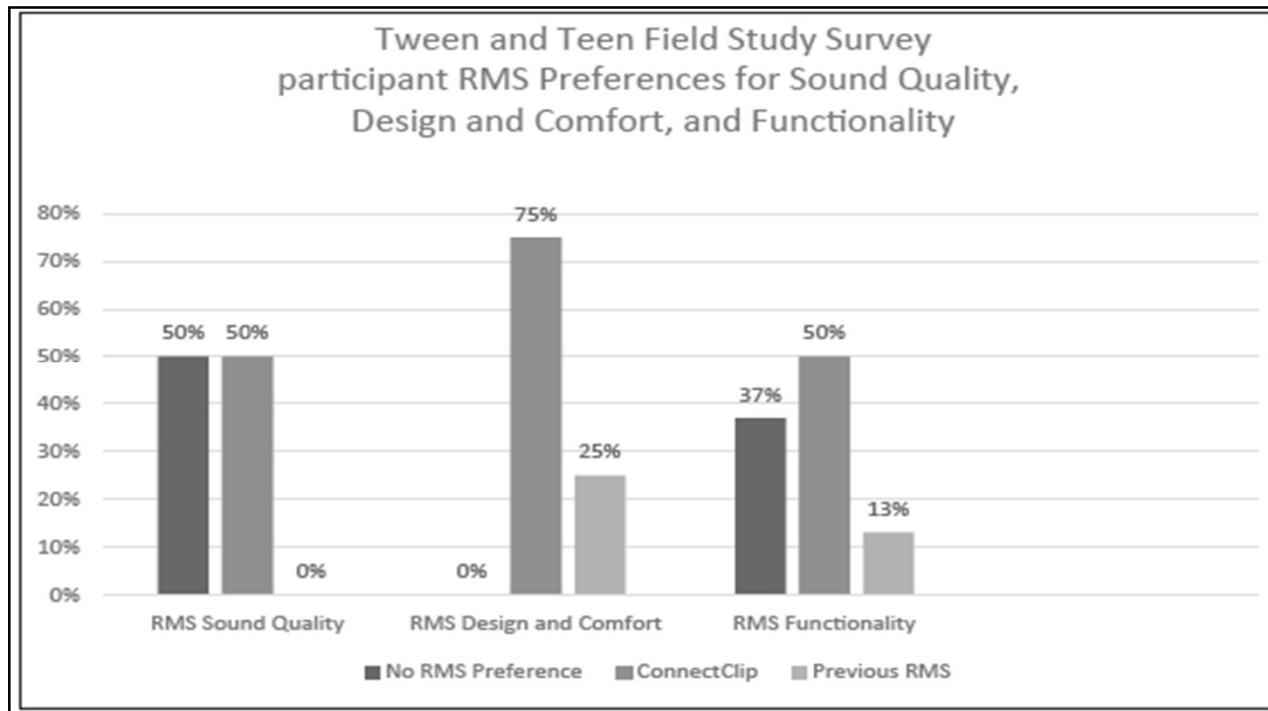
Canadian Field Study

Purpose: Evaluate the classroom listening experiences of tweens and teens who use Oticon Opn hearing aids and the ConnectClip.

Participants: Twelve Canadian tweens and teens with hearing loss (five male and seven female), aged ten to fifteen, participated in this field study, which lasted eight weeks.

Methods: Survey completed with the tweens and teens comparing their current RMS with the Connect Clip.

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What would you like to change about the RMS you have used?

“

The weight. The transmitters are very heavy, and many teachers do not like to wear them because of this. ”

Teacher of the Deaf and Hard of Hearing

What would you like to change about the RMS you have used?

“ _____ ”

Lighter systems; more microphone options.
charging - I wish it could charge faster. ”

Classroom Teacher



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What would you like to change about the RMS you have used?

“ _____ ”

Make something smaller and easy to use. ”

Classroom Teacher



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That calls for..

New solutions to accommodate the classroom criteria

Students:

- ▶ Improved SNR solutions
- ▶ Good sound quality
- ▶ Discreet plug n'play equipment

Teachers:

- ▶ Ease of use
- ▶ Compatibility
- ▶ Access to more students



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There is a new kid in class!



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Introducing Oticon EduMic


Breaking barriers to teaching and learning in the classroom







- World class sound quality
- Designed for the classroom
- Excellent compatibility

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Oticon EduMic

A new wireless remote microphone system

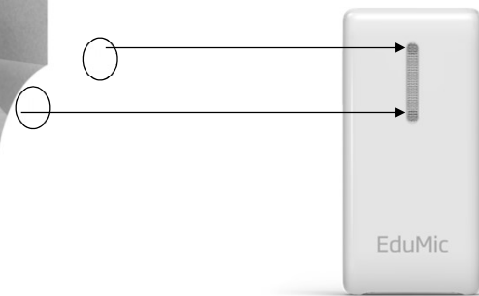


	Velox S	Compatibility	
	OpenSound Navigator™	Contoured modern design	
	2.4 GHz stereo streaming	Built to last	

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World Class Sound Quality

With OpenSound Navigator™

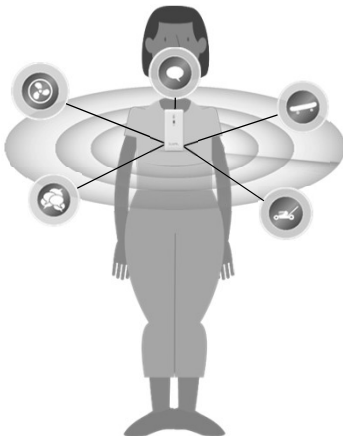


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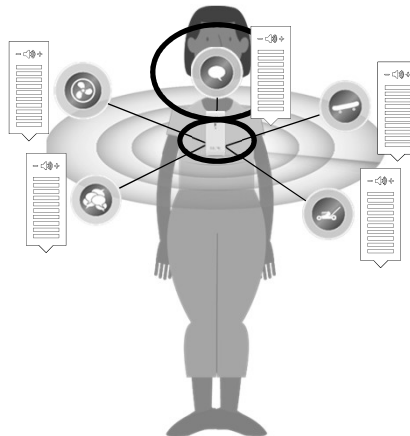
OpenSound Navigator in EduMic

Optimized for learning and classroom usage

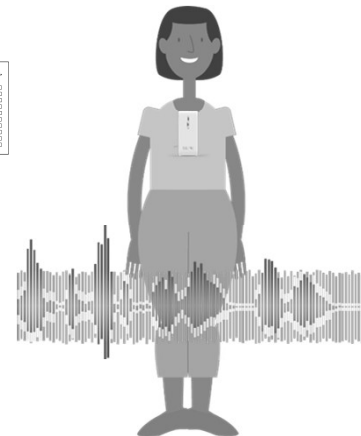
Analyze



Balance



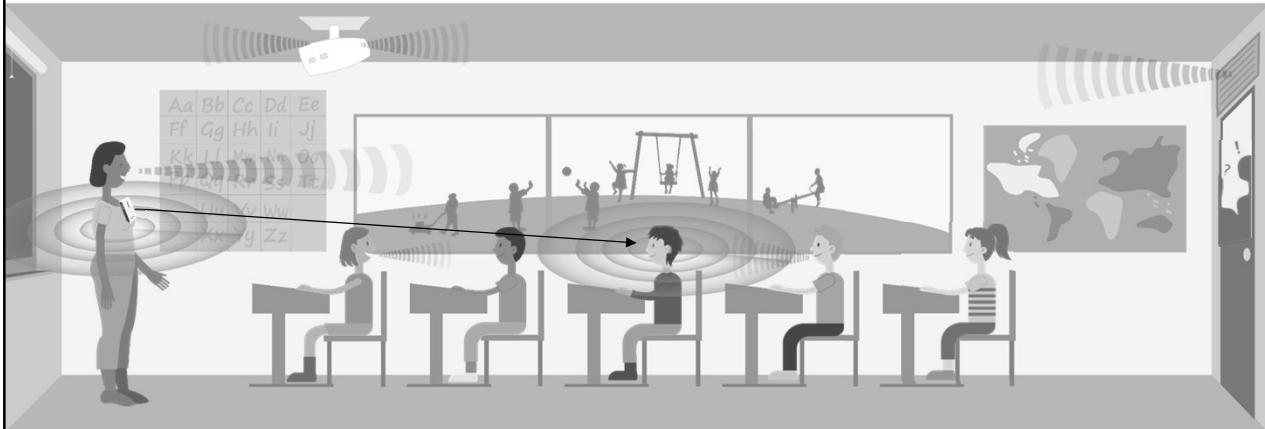
Noise removal



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The EduMic listening experience

OpenSound Navigator at teacher as well as student



Wind Noise Management

Air flow creates fluctuations at each of the microphones



Wind Noise Management attenuates wind noise between words



Wind Noise Management

A clear speech signal minus the wind noise is sent to the hearing aids



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Clear and direct access to speech



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Ease of Use

Designed for today's learning environments

- ▶ Lightweight
- ▶ Sleek, modern, robust design
- ▶ 10 hour battery life
- ▶ Intuitive
- ▶ Range up to 65 ft
- ▶ Pair only once
- ▶ Automatic connection *after initial pairing



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EduMic + Oticon ON App

Streaming and environmental control

- ▶ Control sound streamed from EduMic to aids
- ▶ Select STREAMING to adjust volume of EduMic to aids
- ▶ Choose ENVIRONMENT to adjust the HA mic level



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Compatibility

Excellent connectivity in today's modern classroom

- ▶ Digital modulation via a stable 2.4GHz signal
- ▶ Unlimited number of hearing aids
- ▶ Use with existing classroom systems

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4 EduMic modes

A bridge builder/gateway device for Velox and Velox S instruments



Microphone mode
(65 feet range)

FM mode
(9 feet range)



Jack mode
(65 feet range)

Telecoil mode
(9 feet range)



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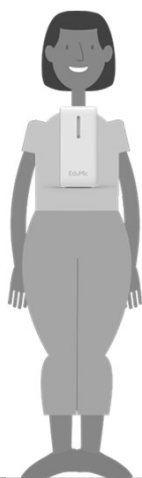


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MEDICAL

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Microphone mode

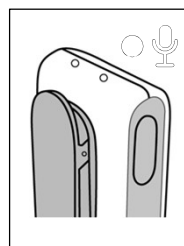
Using 1 EduMic – direct transmission



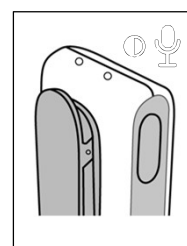
Up to 65 feet



OTICON | **Xceed Play**
OTICON | **Opn Play**



Microphone mode



Mute microphone mode

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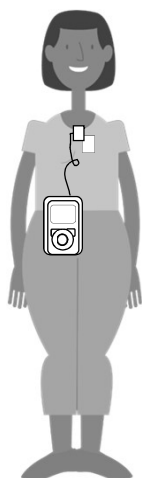
Jack mode for Multimedia use



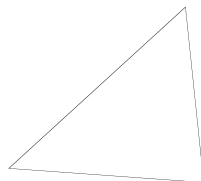
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FM mode example using Amigo

Connecting to existing FM or remote microphone systems



Amigo or Roger mic
Transmits to their
respective receiver



OTICON | **Sensei**



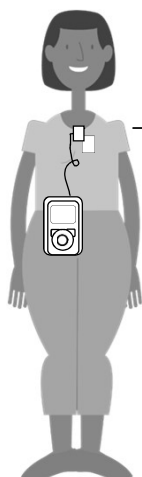
OTICON | **Xceed Play**
OTICON | **Opn Play**



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FM mode example using Amigo

Connecting to existing FM or remote microphone systems



Amigo or Roger mic
Transmits to their
respective receiver



Up to 9 feet



OTICON | **Sensei**



OTICON | **Xceed Play**
OTICON | **Opn Play**



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EduMic - Amigo or Roger as transmitter in use

A bridge builder



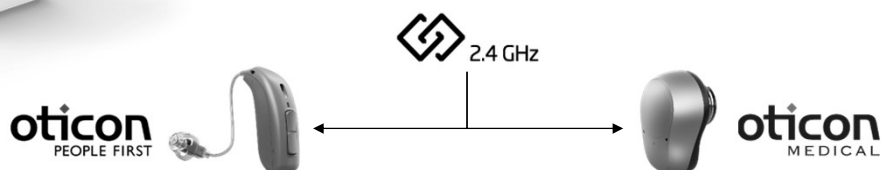
FM mode
(9 feet range)

Student wears Opn Play/Xceed Play BTEs
(plug in universal 3-pin Rx to EduMic, mic function is off, transmits to aids)



Telecoil mode
(9 feet range)

Wearing Velox/Velox S mRITE or Custom
(EduMic transmits teleloop system output to aids; mic function off (public venues))



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Cost-effective solution

Optimal choice for the educational setting

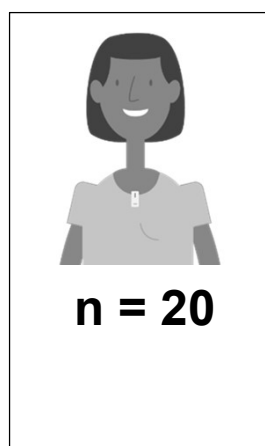
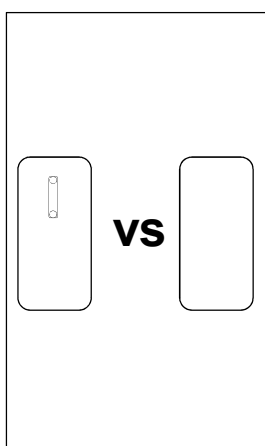
- ▶ Durable, built to last
- ▶ Fully integrated receiver – no need to invest in additional components
- ▶ Initial cost of EduMic is substantially less than a full system

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Evidence for EduMic

Study 1: EduMic usability



**85%
were
experienced
remote
microphone
system
users**

**45%
Elementary**

**5%
Secondary**

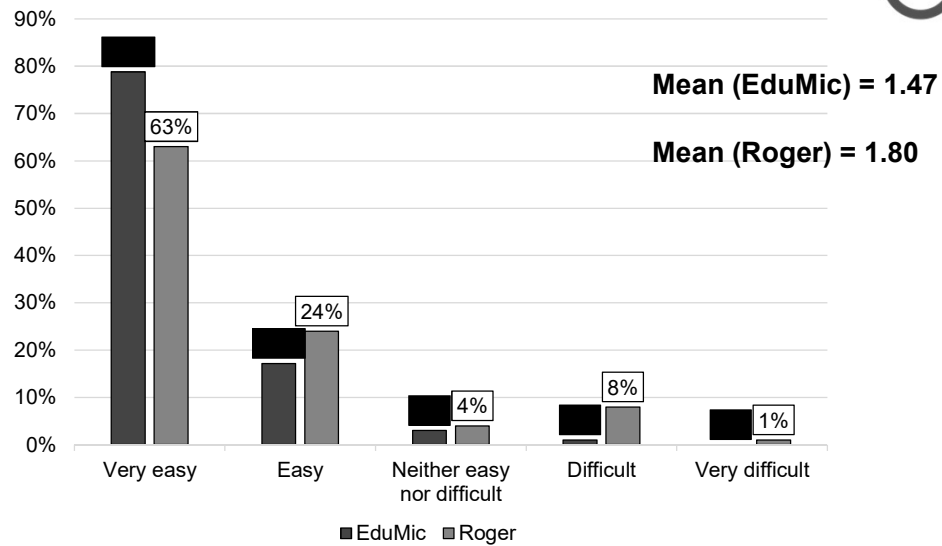
**50%
Special ed.**



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So how did EduMic weigh up?

Ease of use

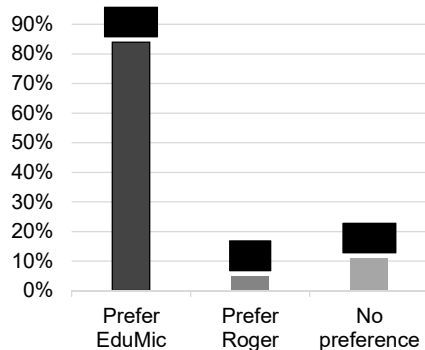


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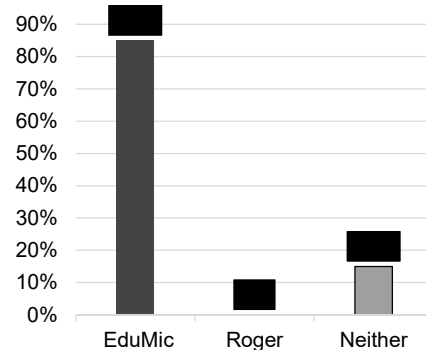
So how did EduMic weigh up?

Design and discreetness

Design



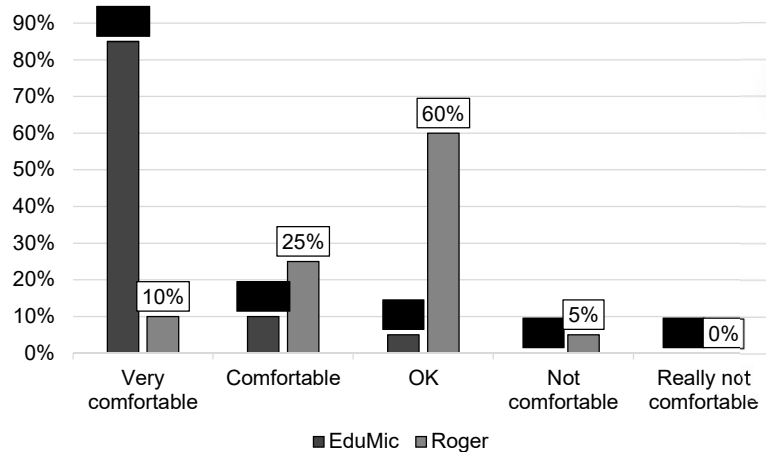
Discreetness



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So how did EduMic weigh up?

Wearing comfort



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What did teachers have to say about EduMic?

“
I prefer the EduMic because it is easier to use, smaller and lighter.....I like the wearing options of the EduMic on the lanyard or on the clip.

“
The EduMic is beautiful and it is light, I love that.

Gordey & Rumley, 2019,
Oticon Whitepaper



These testimonials represent the opinion of the concerned individuals only and may not be representative of the experience of others. The participants have not been paid for their participation, but received a gift card to offset their travel expenses. The testimonials may not be indicative of the future performance or success of any other individuals.

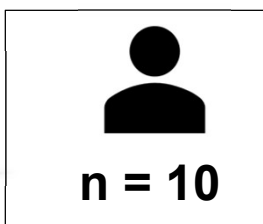
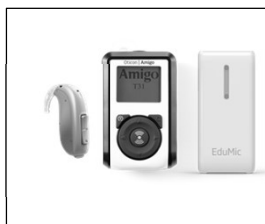
“
The EduMic is lighter, smaller, less bulky, and more discreet.

“
I am excited to see the EduMic – it’s new design – because it is more discreet. This is very important for the self-esteem of the students.

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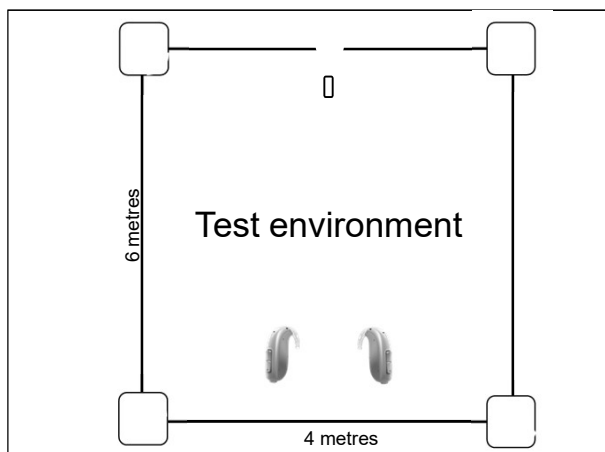
Study 2: EduMic speech understanding

Opn S 1 BTE PP alone vs Opn S + Amigo vs Opn S + EduMic



Target:
65 dBA HINT
sentences

Noise:
0, 55, 65 & 75
dBA
diffuse
cafeteria noise

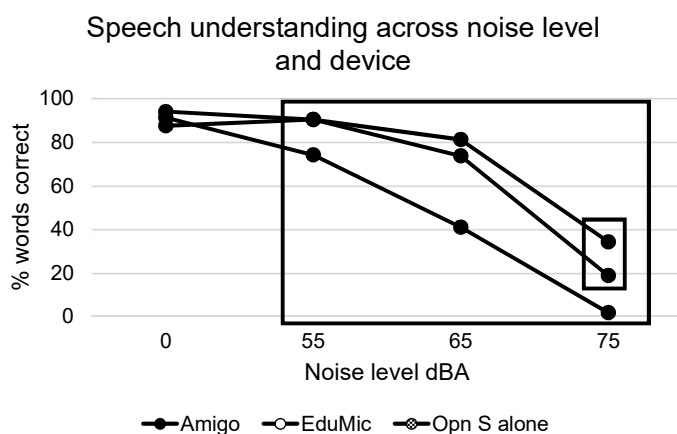


Gordey & Rumley, 2019

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EduMic speech understanding study

Opn S alone vs Opn+Amigo vs Opn+EduMic





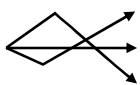
► Speech understanding decreases as the noise level increases

► Wireless microphones are better than HA alone when noise is added

► Participants perform better with EduMic than Amigo at 75 dBA (-10 dB SNR)

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Study 3: Benefit when listening in noise & reverberation

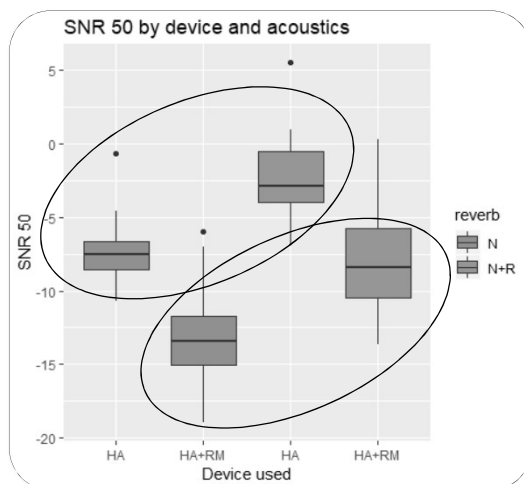
 n = 21	Age: 7 – 18 years of age	 Device configurations
Boys Town National Research Hospital	Target: Pediatric AZ- Bio sentences 60 dB SPL	 Acoustic environments

Lewis, Spratford, Stecker & McCreery, in preparation

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Student benefit in noise & reverberation

Preliminary results

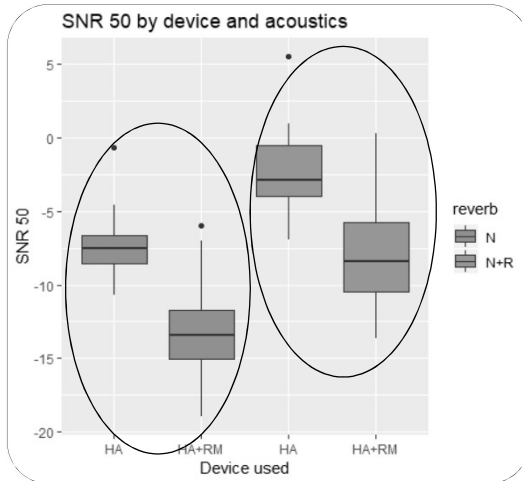


- ▶ Adding reverberation to noise has a detrimental effect on speech understanding (better SNRs are needed)

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Student benefit in noise & reverberation

Preliminary results



- ▶ Adding reverberation to noise has a detrimental effect on speech understanding (better SNRs are needed)
- ▶ In both conditions, using EduMic significantly improves speech understanding compared to the use of HA alone

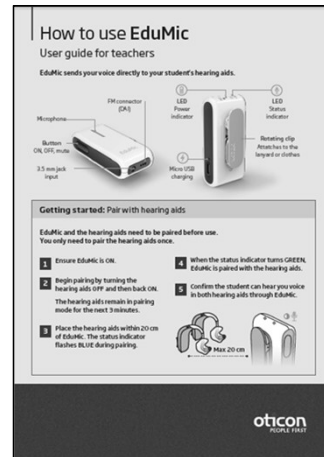
Summary

“

Researchers found a significant improvement with EduMic in speech understanding in a noisy and reverberant environment.

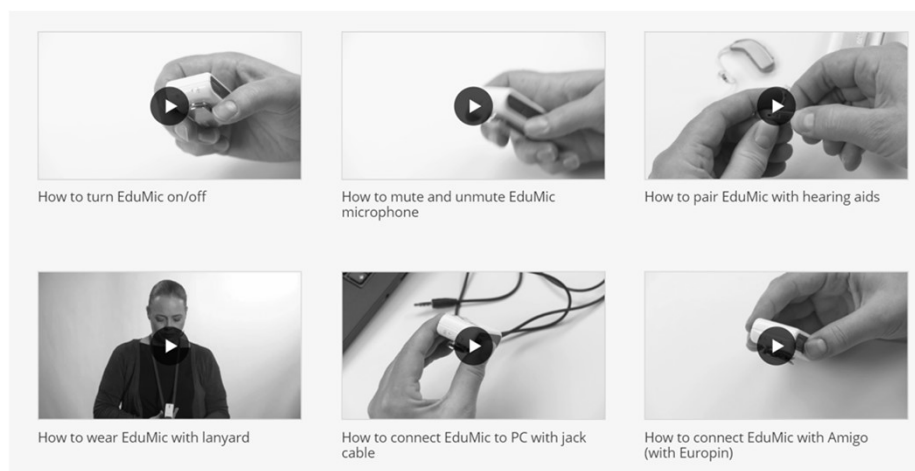
Lewis, Spratford, Stecker & McCreery, *in preparation*

Resources



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Instructional videos



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Classroom Connectivity

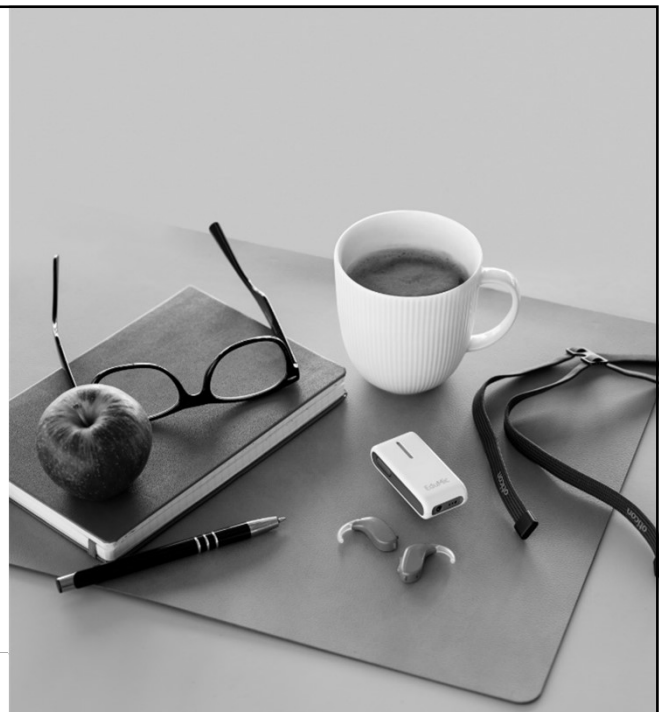
A full range of easy-to-use solutions



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Summary

- ▶ EduMic provides outstanding **sound quality** with improved speech understanding in the classroom
- ▶ **Connects** students with the teacher, multimedia sources and classroom systems
- ▶ Teachers voted EduMic highly on **ease of use**, design, discreetness and wearing comfort
- ▶ **Less costly** compared to competitor systems and durability over the long term improves cost effectiveness
- ▶ The classroom system no longer dictates the choice of hearing aids





Thank You