Hearing Beyond Limits

Assistive Technology for Students with Hearing Impairments

Introduction

Spectrum of Hearing Impairment

- Mild Hearing Impairment
  - Difficulty hearing soft sounds
  - Challenges following conversations in noisy environments
- Moderate Hearing Impairment
  - Cannot hear soft and moderately loud sounds
  - Conversation difficult without hearing aid
- Severe Hearing Impairment
  - Cannot hear most sounds
  - Relies heavily on visual cues and assistive technology
- Profound Hearing Impairment
  - Cannot hear any sound
  - May use sign language and visual communication methods

Challenges Faced by Students with Hearing Impairments

- Communication Barriers
  - Difficulty in understanding spoken instructions
  - Challenges in participating in classroom discussions
- Social Isolation
  - Limited interaction with peers
  - Feeling of exclusion in group activities
- Access to Resources
  - Need for specialized equipment
  - Requirement for tailored learning materials
- Teacher Training
  - Lack of awareness about hearing impairments
- Environmental Factors

Transcription Technologies

- Real-Time Captioning
  - Live transcription of speech during lectures and discussions
  - Provides immediate access to spoken content
  - Enables active participation
  - Supports in-the-moment comprehension
  - Critical for interactive learning
- Post-Event Transcription
  - Converting recorded audio to text after a lecture or meeting has concluded
  - Higher accuracy potential
  - Supports review and study
  - Can be edited for clarity

Transcription Platforms in Use

Spotlight: Google's NotebookLM

- Key Features
  - AI-powered note-taking application
  - Q&A functionality based on inputted notes
  - Can summarize and organize information
  - Helps process complex content
- Privacy Assurances
  - Google's commitment to no data retention
  - No use of content for model training

Beyond Transcription: Active Note-Taking

- Active Engagement with Content
  - Not just passive reception of transcribed text
- Tools for Identifying Key Concepts
  - Highlighting important information
- Organizing Information Meaningfully
  - Structuring notes for better understanding
- Creating Connections Between Ideas
  - Linking related concepts
- Efficient Review After Class
  - Utilizing notes for quick revision

Spotlight: Glean Note-Taking Platform

- Unique Value of Glean
  - Interactive note-taking interface
  - Promotes active learning
- Key Features
  - Audio recording with synchronized notes
  - Quick-tagging of important moments
  - Easy navigation to key points
- Learning Benefits
  - Shifts focus from passive reception
  - Active identification of important concepts
  - Building personalized study guides in real-time
- Current Limitations

Hardware Innovations: Smart Glasses

- How They Work
  - Projects live transcription onto the lens
  - Places captions in user's field of vision
  - Maintains eye contact with speakers
- Advantages
  - Maintains natural conversation flow
  - Reduces divided attention
  - Discrete and less conspicuous
  - Hands-free operation
- Early Adoption Considerations
  - Cost
  - Battery life

Hardware Innovations: Advanced Hearing Devices

- Frequency-Specific Amplification
    - Targets specific frequency ranges where individual hearing loss occurs
- Noise Cancellation
    - Advanced algorithms filter out background noise in classroom environments
- Directional Focus
    - Technology that can focus on the sound source (e.g., lecturer) while reducing ambient noise

Classroom Infrastructure: FM Systems

- FM Systems Installation
  - Audio outlets in every classroom
  - FM transmitter systems
- How It Works
  - Wireless transmission of lecturer's voice
  - Directly to students with FM receivers or hearing aids
- Benefits
  - Improved signal-to-noise ratio
  - Consistent audio quality regardless of distance
  - Reduced impact of classroom acoustics
  - Compatible with many hearing aids

Classroom Infrastructure: Loop Systems

- How Loop Systems Work
  - Use electromagnetic fields to transmit sound
  - Directly transmit to hearing aids with telecoil settings
- Components of Loop Systems
  - Wire loop installed around classroom perimeter
  - Creates a magnetic field carrying the audio signal
- Challenges
  - Installation is expensive
  - Requires physical modifications to existing spaces

Spotlight: Sennheiser Mobile Connect

- Innovative Approach
  - CUHK testing Sennheiser Mobile Connect as an alternative to expensive installations
- Key Features
  - Streams high-quality audio over Wi-Fi
  - Supports simultaneous users
  - Students connect via app on personal devices

Leveraging Personal Technology

- Utilizing Existing Devices
  - Students use their own smartphones and earbuds
  - Reduces stigma by using mainstream technology
- Enhanced Audio Quality
  - Provides higher quality audio than phone microphones
- Institutional Support
  - Respects student preferences
- Cost-Effective Solutions
  - More flexible than permanent installations
  - Potentially more cost-effective

Best Practices for Integrating Technology

- Integrating Technology in Classrooms
  - Utilize interactive tools to enhance learning
  - Incorporate digital resources for diverse subjects
- Supporting Diverse Learning Needs
  - Adapt technology to accommodate different learning styles
  - Provide accessible materials for students with disabilities
- Best Practices for Technology Integration
  - Train teachers on effective use of technology
  - Continuously evaluate and update technological tools

Faculty Concerns and Policy Considerations

- Common Concerns
  - Intellectual property protection
  - Unauthorized sharing of content
  - Impact on teaching style and candor
  - Student privacy in discussions
  - Potential decreased attendance
- CUHK's Approach
  - Updated course outlines to state recordings are for learning purposes only
  - Policy aims to balance student access needs with faculty concerns
- Policy Considerations
  - Clear Recording Guidelines
- Data Privacy Concerns

Student Preferences and Reading Fatigue

- Challenges in Student Reading Preferences
  - Reading fatigue is a significant concern
  - Large blocks of text can be overwhelming
- Mixed Learning Preferences
  - Auditory Learners
  - Reading/Writing Learners
  - Visual Learners
  - Kinesthetic Learners
- AI-Powered Solutions
  - Intelligent summarization of content
  - Interactive Q&A with notes
- Getting to Insights Faster

Multilingual Challenges and Solutions

- Current Challenges in Mixed-Language Environments
  - Cantonese-English mixing produces significant inaccuracies
  - Code-switching is common in Hong Kong education
  - Technical terms often remain in English
- Emerging Solutions for Multilingual Issues
  - Custom language models trained on educational content
  - Human review for critical content
  - Domain-specific terminology databases
  - Post-processing tools for common error correction
- Language Learning Opportunities
  - Reinforcing Bilingual Skills
  - Accurate transcriptions of code-switching can help students develop stronger bilingual proficiency

The Path Forward

- Commitment to Students
    - Keep students at the center of all accessibility initiatives
- Embrace Innovation
    - Continuous innovation and experimentation
- Knowledge Sharing
    - Share knowledge across institutional boundaries
- From Accommodation to Inclusion
    - Move from accommodation to true inclusion
- Thriving Learning Environments
    - Create learning environments where all students can thrive

Useful Link

Zoom
Managing manual captions
Enabling and configuring translated captions
Getting started with Zoom AI Companion features
Using Voice Recorder with AI Companion

Teams
Accessibility tools for Microsoft Teams - Microsoft Support

Panopto
Powered by AI - Panopto

Android/iOS Accessibility features
Android 無障礙工具總覽 - Android 無障礙工具說明
探索 Apple Education 的輔助使用功能 - Apple 支援 (香港)

NotebookLM
Google NotebookLM | Note Taking & Research Assistant Powered by AI
What is NotebookLM Enterprise? | Google Agentspace | Google Cloud

Genio
Beautifully simple learning tools | Genio, formerly Glean

Audio Hearing Glasses
Compare Hearing Aid Prices, Styles and Features | Soundly
Nuance Audio Hearing Glasses Review: Features, Price & How They Compare

PLAUD.AI
PLAUD.AI HK

CUHK Classrooms
Technologies and Tools for Supporting SEN Students at CUHK
CYT LT1A (1/F) < Cheng Yu Tung Building (CYT) < Lower Level < Location < Classrooms/ Lecture Theatres Facilities < Location < Classroom Service | Audio Visual Services Unit - The Chinese University of Hong Kong
MobileConnect Station | 森海塞尔
MobileConnect_System_Specification_v1.2_EN.pdf

Policy, Guidelines & Support
Policies, Guidelines and Procedures | Academic and Quality Section (AQS), Registry, The Chinese University of Hong Kong

Guidelines for Inclusive Virtual Teaching and Learning Environment (restricted – CUHK internal)
Universal Design for Learning (UDL) in Action – Centre for Learning Enhancement And Research – CLEAR, CUHK
Course Planning and Review Services – Centre for Learning Enhancement And Research – CLEAR, CUHK