Assistive Technologies for the Deaf

CSCI 497T/597T

Today's Topics

- Deafness and the Deaf Culture
- AT for Deaf/HH

Hearing Impairment and Deafness

- Hearing is the reception of sound by the ear, its analysis, and its transmission to the brain.

- Impairment: An impairment is any loss or abnormality of psychological, physiological or anatomical structure or function

- Deafness is the complete inability to hear sound.

Timing of Hearing Impairment

- Pre lingual
  - Loss of hearing before speech and language developed

- Post lingual
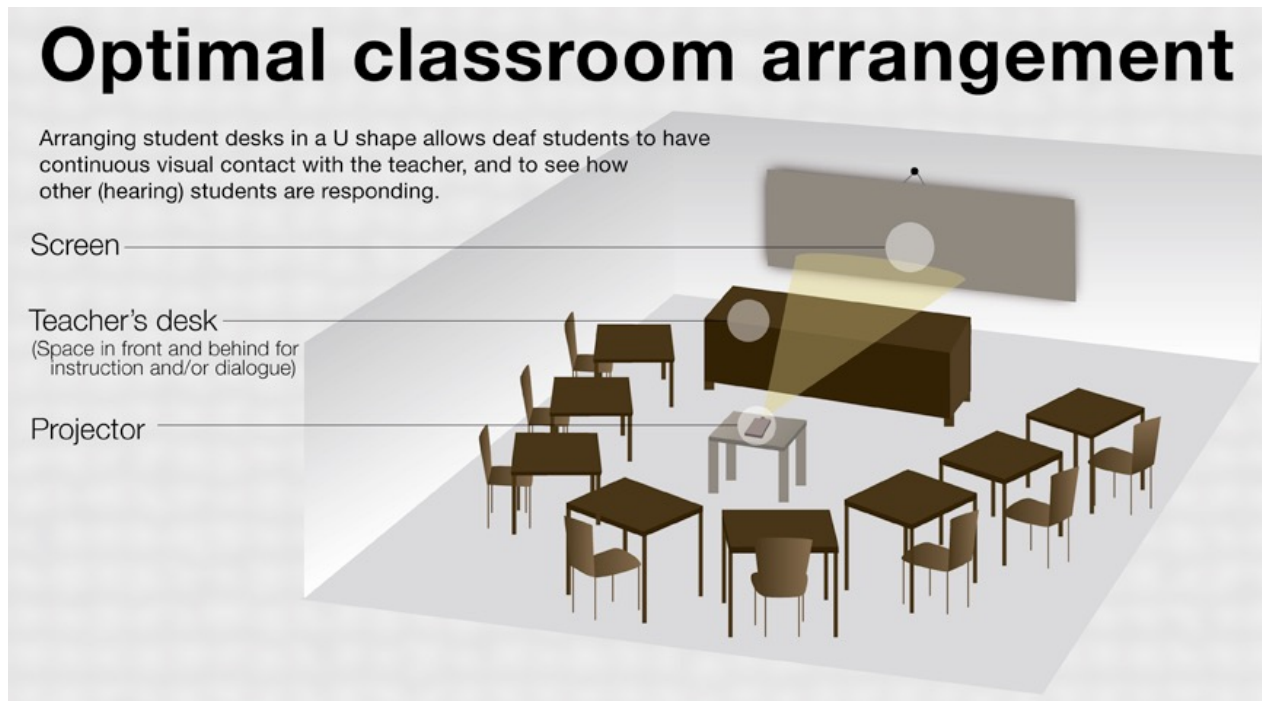 - Loss of hearing after spontaneous speech and language has developed.

Language and Communication

- Oral/aural
- American Sign Language (ASL)
  - Conceptual language
  - Fingerspelling
- Simultaneous communication
  - Manually coded English
  - Pidgin sign language (or contact signing)

Communication Preferences

- Circular seating
- Transcript of audio information
- Visual information
- Keep your hand and face toward the deaf while speaking

Optimal classroom arrangement

Arranging student desks in a U shape allows deaf students to have continuous visual contact with the teacher, and to see how other (hearing) students are responding.

Screen

Teacher's desk
(Space in front and behind for instruction and/or dialogue)

Projector

Assistive Technologies for the Deaf

- Hearing Aids: a small electronic device that you wear in or behind your ear. It makes some sounds louder

- Assistive listening devices e.g. TV-listening systems or telephone-amplifying devices

- Texting

- Video calling

- Captions

Captioning is the process of converting audio content into text and displaying the text on a visual display.

- Equivalent and equal in content to that of the audio, including speaker identification, sound effects and music description
- Synchronized and appear at approximately the same time as the audio is delivered
- Accessible and readily available to those who need or want them.
- Must have sufficient size and contrast to ensure readability, and be timely, accurate, complete, and efficient.
- When displayed, captions must be in the same line of sight as any corresponding visual information, such as a video, speaker, field of play, activity, or exhibition.

TTY (TeleTYpewriter): Dial 711

- Robert Weitbrecht, a deaf scientist, developed the TTY in the 1960s.

- Deaf/HH were able to call each other directly using these devices

- To provide greater access, TTY relay services began, first as volunteer programs with limited hours and areas, connecting deaf and hard of hearing TTY users with people who used telephones.

- The communication assistant converts voice-to-text and text-to-voice communication. The text is displayed on the user's TTY.

- Because communication using a TTY could flow only in one direction at a time, TTY etiquette was developed.

  - Signal conversation turn-taking by saying or typing "go ahead" (GA)

  - Signal the end of a conversation by saying or typing "stop keying" (SK)

  - https://www.youtube.com/watch?v=3hMj8Y0EFlc

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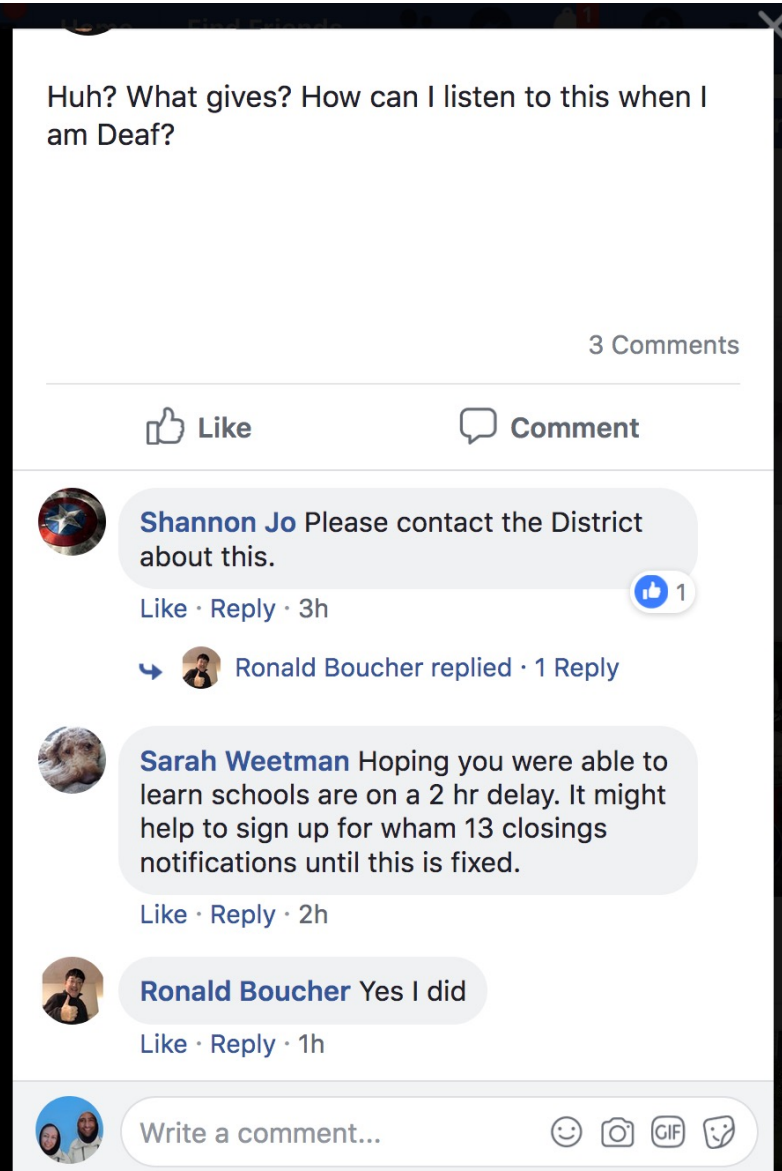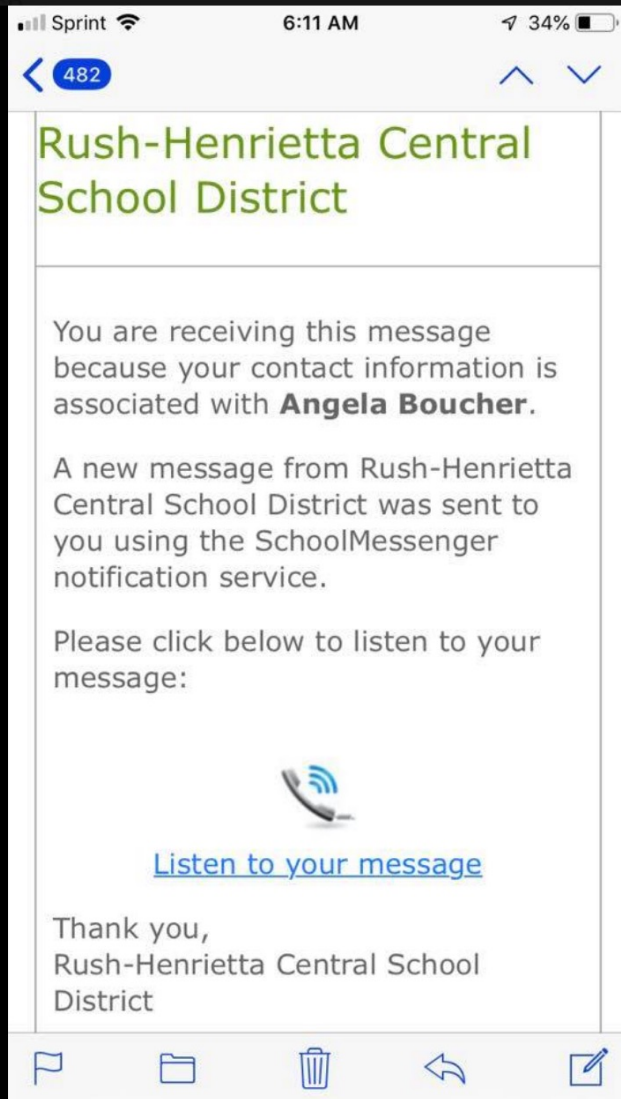
Sound Design in Software

- Notifications
- Games (Racing and Shooting games)
  - https://www.youtube.com/watch?v=8zAuSW0Lv10

Apps for the Deaf

- Live caption
  - http://www.livecaptionapp.com/
- Ava: who says what
  - https://www.ava.me/
- ASL keyboard
  - https://signily.com/
- Microsoft Translator
  - https://translator.microsoft.com/

Discussion

- What mainstream digital systems may create accessibility barriers to DHH individuals?

- How to mitigate deafness related accessibility risks in software development?