Teaching with Technology: Removing Language Barriers in the Classroom

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"The limits of my language mean the limits of my world"

- Lugwig Wittgenstein

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Learning Objectives

- Identify both the opportunities and barriers that exist for all students with regard to language in the classroom setting
- When we design of curriculum and instruction through the lens of Universal Design for Learning (UDL), accommodations, and Educational Technology, we can make language (more) accessible/remove barriers and improve academic outcomes for all
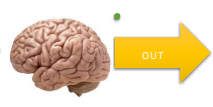
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Language is arguably the most impressive tool invented to date.

It is one of the most important (and frequent) tools we use to teach students in the classroom as well as the tool we ask them to learn both with and from.

What needs to happen in here?
How does language mediate learning?

Language through our ears: spoken words +

Language through our eyes: reading/images/gestures

IN

OUT

Language through their mouths: spoken words +/gestures

Language through their fine motor system: written words + and images

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Assumptions

- All language learners, monolingual, simultaneous bilinguals (multi-linguals), sequential bilinguals (multi-linguals) are **heterogeneous language learners**
- Robin may use different terminology from the field of Communication Disorders and not the field of English Language Learning or even Linguistics
- Language learning a **process** and both **nature and nurture** play important roles, that being said, reading and writing are not innate skills, we are not necessarily "pre-wired" to learn these skills
- Although there is evidence for a "critical" or "sensitive period" for language development, humans learn language throughout their lifetime
- Media or technology is neither good or bad, it is how you use it
- We are tool designers and users – we shape our tools and tools shape us

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Why Are We Here?

- Over and under identification of disabilities related to language for students learning a second language
- 56 classrooms serving low income children found teacher language modeling was of high quality in only 4% of classrooms (Justice, Masjburn, Hamre, & Pianta, 2008)
- Because we care!

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How do children learn language? From birth to 5 years in 5 minutes!

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Phonology

• How many sounds in the English language?
• How many in Spanish?
• How many sounds in the following? How many letters?

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Language Learning is a Developmental Process Dependent Upon Many Variables:

• Tools:
  • Hearing
  • Seeing
  • Fine Motor and Sequencing Skills: making vowel and consonant sounds, then words, etc.
  • Gross Motor
  • Kinesthetic/Touching
• Input
  • Motherse ("caregiverese")
  • Amount and quality of input (Hart and Risley, year)
  • Teacher talk correlated with student syntax (grammar) and semantic (vocabulary) learning in preschool, kindergarten and elementary grades
• Expectations for language use/Output
  • Many opportunities to talk
  • Environments that support initiation, risk taking and are sensitive to identity (and culture)
  • Pragmatics – the social use of language

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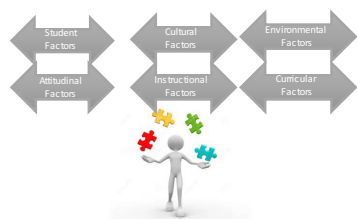## Add a Second Language (or more), What Do We Know?

- **language skills** are widely thought to **play a role in accounting for** what is termed the **achievement gap** between language minority and monolingual children, understanding the language skills of children from language minority homes is important for student success
- Hypothesis: two languages is two systems, but they influence one another
- Given the evidence that the rate of monolingual development depends on how much input children experience, it should not be surprising that **bilingual children, who must on average receive less input in each language (unless they sleep less or their parents talk twice as much) take longer to learn each of their languages than monolingual children take to learn just one**
- The ease with which children acquire a second language has been greatly exaggerated
- Second-language acquisition has effects on children's proficiency in their first language, **sometimes the first language is lost altogether**
- Sometimes a first language is not lost, but the **second language becomes the dominant language**
- **Additive bilingual environments** in which the first language continues to be supported as the learning of second language is also fostered
- **Subjective bilingual environments** in which the second language is supported at the expense of the first
- No one has argued that these trade-offs between first and second language proficiency reflect the limitations of the brains capacity to handle two languages. Rather, this outcome reflects the sociology and psychology of language use the influence of peers in the larger culture converge to make English the preferred language in the United States.
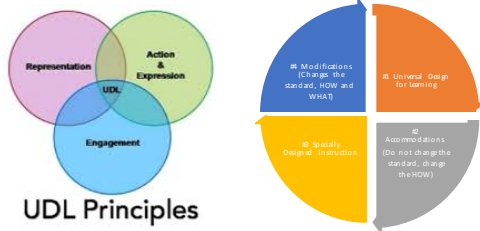
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- **Differences in input conditions** explain why second language acquisition in childhood proceeds differently and has a more variable outcome than first language acquisition.
- Children typically **do not have the one-to-one dyadic interaction with the speaker of the target language that characterizes the circumstances a first language acquisition**
- Children tend to be thrown into situations in which they my **sink or swim** and in which many of their language models are their peers.
- Fillmore (1991) has describe the process of second-language acquisition by children as consisting of their **memorizing large chunks of speech to use for communicative purposes and then only gradually analyzing these chunks into their component parts** (top-down versus bottom up)
- **Academic language is different than conversational speech**

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Mismatch Model

Hidden Weaknesses (disabilities?)

Edyburn, D.L. (2006). Assistive technology and mild
disabilities. *Special
Education Technology Practice*, 8(4), 18-28.

Prosthesis/cognitive Prosthesis or tool/Cognitive Tool (and strategies)

Prosthesis ~ Tool

Cognitive Prosthesis

Cognitive Tool

How do we teach to the standards for all students?

- The standards guide us in what to teach – not how.
- The CCSS or Oregon Standards are changing HOW we teach, because the standards are different and necessitate that we change the way we have been teaching in the past
- We still have a lot of **flexibility** in how we **deliver instruction**, how we **make it relevant** and **engaging** to our students and how they **demonstrate proficiency**

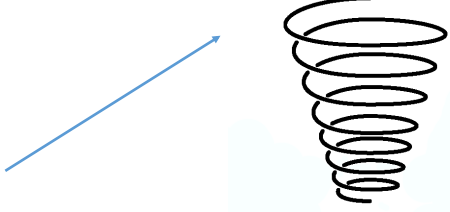Universal Design for Learning, Accommodations, Specially Designed Instruction & Modifications

SAMR
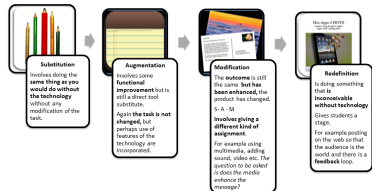
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Language Learning

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Background Knowledge

- People construct new knowledge based on their current knowledge
- There is a good deal of evidence that **learning is enhanced when teachers pay attention to the knowledge and beliefs that learners bring to a learning task**, use this knowledge as a starting point for new instruction, and monitor students' changing conceptions as instruction proceeds (How People Learn)
- Expertise – novice to expert

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Fish is Fish by Leo Leonni

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Which List Is Easier To Remember:

- 1) Gigan,
- Angiris,
- Megalon,
- Mothra,
- Gigantis,
- Mora,
- Hedora,
- Minya

- 2) pterodactyl,
- Hippopotamus,
- tyrannosaur,
- rhinoceros,
- giraffe,
- triceratops,
- alligator,
- elephant

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Barrier: vocabulary

- Vocabulary is the largest determinant of **comprehension of language**.
- By K, the number of words known orally is the **strongest predictor** of children's **reading comprehension** when they reach the upper elementary grades (Scarborough, 2001).
- "Vocabulary knowledge is necessary for effective **listening, speaking, reading, and writing skills**, and a student's ability to acquire new vocabulary is an important contributor to academic success (Sweeny & Mason, 2011)."
- After grade 2, most children can and should acquire **new vocabulary from the books** they read.

Who experiences this barrier?

- Heart and Risley (1995) vocabulary and SES
  - By 3 years of age, there is a 30 million word gap between children from the wealthiest and poorest families.
- English language learners
- Student who do not read at grade level
- Students with Disabilities: Receptive & Expressive Language Disorder, ADD/ADHD, Intellectual Disability, Processing Disorder
- Children with multiple Adverse Childhood Experiences ACES)
- Students with frequent absences?

Vocabulary Growth & Technology

- Dictionaries
  - Picture/Word/Bilingual Dictionaries
  - Online Dictionary
    - Merriam Webster Learner's Dictionary FREE
  - Dictionary App with text-to-speech
    - Merriam Webster App FREE (iOS/Android)
  - Dictionary App Bilingual Support
    - Learner's Dictionary App $4.99 (iOS)
    - Nglish APP FREE (Android) English/Spanish Translator
    - Se APP FREE (Android) English/Arabic Translator
  - Online Thesaurus
    - Thesaurus.com
  - Siri
  - Google
  - Talking hand held dictionaries
  - Online math dictionaries with graphics and animations
    - A Math's Dictionary for Kids
    - Visual Math Dictionary
    - Illustrated Mathematics Dictionary
   - Math Dictionary for Kids

Improve vocabulary

- Augment with Images
  - Allows for understanding with eyes and ears (redundant)
  - Images are less fleeting then words presented auditory
  - Images may be easier to decode then words
    - Symbolstix
      - News to You
      - Unique Learning System
  - Boardmaker
  - Google Images FREE
  - Camera/digital photos FREE
  - Websites/ Wikipedia
  - Teacher/ Student drawings FREE
    - Paper, blackboard, whiteboard, ELMO
    - Educreations FREE (iOS)

Improve vocabulary

- Word studies
  - Visuwords FREE
- Word games
  - Free Rice FREE
  - Analogies
- Word Clouds/Banks
  - Wordle FREE
  - Taxedo
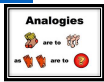
Improve vocabulary

- Digital text
  - Add images
  - Hyperlink (dictionaries)
  - Highlight
  - Bold
  - Italicize
  - Increase/decrease font
  - Embed metacognitive hints
    - Example: "Is this something we studied last week?" "Has this ever happened to you?"
  - Embed comprehension questions
  - Cognitive rescaling
    - Text Compactor FREE
    - News ELA FREE

Improve Vocabulary

- Read for fun
- Read to learn

Barrier: Reading at Grade level (or difficulties with decoding & Fluency)

The So-What Test:

We read with our eyes

We read with our fingers

We read with our ears

*Only changes the standard if the standard is related to decoding or fluency
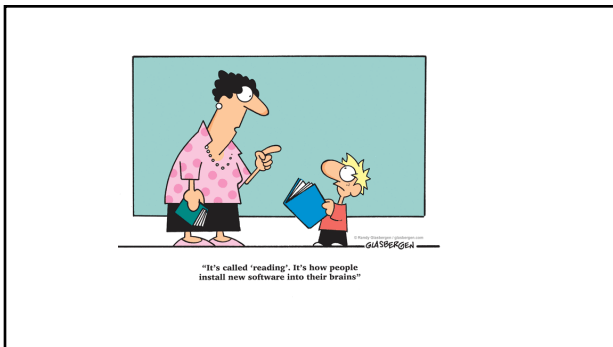
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"It's called 'reading'. It's how people install new software into their brains"

Accessible Educational Materials (AEM)

- Accessible Educational Materials, or AEM, are materials that are designed or converted in a way that makes them usable across the widest range of student variability regardless of format (print, digital, graphical, audio, video). IDEA (Individuals with Disabilities Education Act) specifically focuses on accessible formats of print instructional materials.
- **In relation to IDEA, the term AEM refers to print instructional materials that have been transformed into the specialized formats of braille, large print, audio, or digital text.**
  - **Braille**
  - **Large Print**
  - **Audio**
  - **Digital Text**

http://aim.cast.org/

Audio/Text-to-Speech

- Bookshare.org Free (Qualified print disability)
- Read2Go $19.99 (iOS)
- VoiceOver FREE (iOS)
- Read Outloud (Free download on Bookshare.org Mac/Win)
- SOLO by Don Johnston
- Learning Ally (Audio books/ natural voice)
- Tumble Books
- Digital Pen Example
- Built in TTS Mac
- Built in TTS Win
- Talking Books and Braille Library
- Audible
- Audio Memo

Optical Character Recognition

Think worksheets/photo copied materials
- Abc
- Read Iris
- Prizmo
- Snapverter (Crome/Read & Write for Google add-on)
- Claro PDF
- SnapType
- Read & Write for Desktop
- Kurzweil 3000
- PDF Expert

Make your own accessible book

- 30 Hands FREE (iOS)
- Adobe Voice FREE
- Book Creator $4.99 (iOS)
- Tellagami
- ExplainEverything
- SlideIdea FREE
- Aurasma FREE
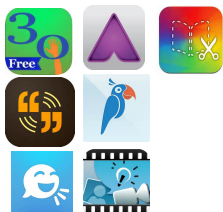
Reading Comprehension/Cognitive rescaling

- Accelerated Reader 360 (FREE iOS/MAC/Win)

Writing: motor Aspect

- Handwriting
  - Boogie board
  - Educreations with stylus
  - Touch screen
  - Fill in the blank, circle, multiple choice
- Dictation
  - Voice Memo
  - Siri
  - Dragon App FREE
  - Google Voice FREE
  - Built in STT in Mac FREE
  - Built in STT in Win FREE
  - Word prediction
    - Co-writer ($14.99 App or SOLO)
    - Texting (Built in iOS)

We saw wal
1: whales
2: while
3: wild
4: walking
5: whole

CO Writer 7

Writing: composition

- Graphic Organizers/Mind Mapping
  - Inspiration/kidspiration
  - Inspiration Maps FREE/$9.99 App (iOS)
  - Mind Meister
  - Mindomo
- Note Taking
  - Notability ($5.99 iOS)
  - PaperPort Notes (Free iOS)
  - Paper (FREE iOS) Video
  - ThingLink (Basic FREE/Win/Mac) Video

Barrier: math

- Mental models/ manipulatives /virtual manipulatives
  - National Library of Virtual Manipulatives FREE
    - http://nlvm.usu.edu/en/nav/vlibrary.html
  - Math Playground FREE
  - http://www.mathplayground.com/math_manipulatives.html
  - Virtual Manipulatives! FREE https://itunes.apple.com/us/app/virtual-manipulatives!/id471341079?mt=8

Engagement: Identity, Agency & Relevance

- Wii for social skills, physical activity
- Scratch
- App Inventor
- Video Games for context and vocabulary (Oregon Trail)
- Hopscotch FREE
- LightBot
- Chromville

Contact Information

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