The big challenge for us as educators “is how to best take advantage of the uniqueness conferred on us as a species exhibiting several intelligences.”

Howard Gardner

Agenda

- Multimodal Learning
- Effective Strategies—CSTP
- What are FONEMZ?
- FONEMZ links to literacy—FONZABET
- FONEMZ and iPad enhance learning
- How to relate therapy to real life
The manner in which one teaches dictates the manner in which students learn.

Multimodal/multisensory presentation of new information is the most effective way to meet the needs of a diverse population.

What approaches of teaching most effectively connect with multisensory learning?

Anita Archer, PhD
http://explicitinstruction.org/

Videos
Active Participation
Instruction

An engaging environment connects with students' prior knowledge, life experience and interests
Autonomy, interaction and choice
Promote self-directed, reflective learning
Engaging in problem solving and critical thinking
Make the subject matter meaningful, connect with real-life contexts
Monitor learning and adjust while teaching
California Standards of the Teaching Profession

- Creating a **rigorous learning environment** with high expectations and appropriate support for all students
- Establishing a climate that is **emotionally safe** and promotes **fairness and respect**
- Promoting **independent and collaborative learning opportunities** that encourage constructive and productive interactions with **standards for behavior**
- **Routines** that support learning
- **Using instructional time effectively**

Benefits of Multimodal Input

- All typically developing children need sensory activities regardless of their input preferences
- Ability to perceive and recognize your own movements is crucial for linguistic development, articulation, reading and writing. (kinesthetic)
- Mutually dependant nature of visual and auditory information via a “cortical network
- How do we utilize visual cues for phonology?

What is FONEMZ?  

- FONEMZ is an **interactive multimodal** approach that is used to teach articulation, phonological awareness, literacy skills, ... The primary components consist of symbols of a different color and a distinct shape for each of the 40 main phonemes in General American English.
FONEMZ is a “Bottom Up” Approach

- This means that no other information or knowledge is needed before beginning instruction.
- The clinician only needs to recall 3 to 6 shapes and the sounds associated with them.
- Learning progresses by adding in small increments . . . Less is more.

Color & Memory

- Color is an important feature for children and aids in memory retention
- Automaticity of color: an individual encodes color without any deliberate intent
- Can help identify similarities and differences with phonemes.

3D and 2D Interactive Tool

- One-to-one phoneme/FONEM relationship (40 English phonemes ~250 graphemes representing them)
- Tactile qualities allow for physical engagement
- Color & shape assists auditory memory.

Multimodal Approach

- Maximizes auditory, visual, tactile and kinesthetic modes
- Interactive play promotes autonomy and reflective learning
- Visual discrimination supports auditory discrimination
- Proprioception is supported visually
Building Literacy, Speech and Communication Skills Multi-Modally with FONEMZ and iPad

Consonants

Vowels

Felt FONEMZ
Fun FONEMZ

Magnet FONEMZ

FONEMZ Plus
Order of Introduction

- **VOWELS**
  - [ɑ], [u], [i]

- **CONSONANTS**
  - [p], [b], [m]

Individual Therapy Video

- Felt FONEMZ, Fun FONEMZ and Reflective Learning
- It illustrates the use of FONEMZ to teach articulation improvement and phonemic awareness.
- It demonstrates a multimodal approach for learning.
Active Participation
Instruction/Partnering

- It is most important with all ages to begin with sounds the student can make. Why?
- Do not progress to target sounds until the student has demonstrated that she understands that each of the shapes represent a specific sounds.
- How does the student show this?
- Why is this important to do?

Specific Populations
Who Benefit

- Deaf and Hard-of-Hearing/Cochlear Implant
- Autism spectrum
- Apraxia
- Dyslexia
- Down syndrome
- ADHD

FONEMZ® and Older Populations

- Middle School & High School articulation, phonemic awareness and spelling
- English Language Learners
  - Pronunciation and Accent Reduction
- Stroke Patients
Articulation

- Training in articulation has been shown to concurrently increase phonemic awareness (Roberts, 2005).
- Kamhi (2006) found that children with speech delays can benefit from training in phonemic awareness because it may lead to improved articulation.
- Both articulation and phonemic awareness appear to be fundamental to academic achievement and literacy. Because of this, many therapy approaches have been developed to work on these skills (Allor, Gansle & Denny, 2006).

Phonemic Awareness

- Phonemic awareness and articulation are directly linked (Roberts, 2005).
- Phonemic awareness has the distinction of being the best predictor of early reading skill (Hulme et al., 2002).
- Phonological awareness abilities relate directly to future reading and writing achievement (Torgesen, Wagner & Rashotte, as cited in Gillon, 2005).

Sounds to Reading

- Direct correlation for children with speech-sound disorders and poor phonological awareness.
- Phonological awareness skills are linked to literacy in a predictive way.
- The FONEMZ approach works on both articulation and phonology.
- The FONZABET links to phonics.
Building Literacy, Speech and Communication Skills Multi-Modally with FONEMZ and iPad

CSUS, NSSLHA
February 9, 2013

1. Literacy & Early Intervention
   - Children can make the best improvement in phonological awareness when they receive the training prior to first grade (National Reading Panel (NRP), 2000)
   - Instruction in phonemic awareness is beneficial to all types of children, whether typically developing or disabled (NRP, 2000)

2. RTI: Response to Intervention
   - Tier 1:
     - Provide access to, and progress in, the general education curriculum
     - Differentiate instruction
     - Apply Universal Design for Learning (UDL) to traditional strategies
   - Tier 2:
     - Increase scaffolds to provide the right level of support
     - Connect to the curriculum to improve specific skills
     - Collect valuable formative data to monitor student progress
   - Tier 3:
     - Maximize resources to allow student-driven practice with skill-building assignments
     - Provide accommodations that give students the intense, individualized literacy supports for use throughout

3. Video
   - FONEMZ in RtI Tier 1, 2 & 3
   - Preschool & Middle School
     - This video demonstrates the use of FONEMZ in the various Tier groups
     - Self-directed learning
     - Various Middle School activities
Autonomy, Interaction & Play

- **Erik Erikson**
  - Autonomy: developmental stage, toddler years (1 – 3)
  - Healthy independence of exploring their world
- **Glaubman et al.** looked at **metacognition**
- **Jean Piaget**
  - Play is a tool for advancing children’s cognitive development
  - Practicing new skills in an enjoyable way increases learning
- **Yopp** (as cited in Zeece, 2006) for developmentally appropriate therapy, the first recommendation is to make the therapy playful and fun without relying on drill and rote memorization.

RtI Tier I - Video

- This video demonstrates the use of FONEMZ with an entire class of Head Start Preschoolers
- **Tier 1**
  - The same method was used in a federal research project with Head Start Preschoolers
  - 24 students. Ages 2, 3 & 4 years.
Standard Hierarchy of Phonological Development

- Develop listening habits – tune into print
- Identify words that rhyme – produce rhyming words
- Identify beginning sounds – ending – middle
- Segment sentences into words - words into syllables-
- Blend syllables into words -Blend sounds into syllables
- syllables into words
- Blend syllables into words – blend sounds into words
- Delete syllables in words – substitute sounds in words

   Complete in preschool to first grade

FONEMZ Hierarchy of Phonological Development

- Develop listening Habits – produce individual sounds and develop recognition
- Blend sounds into syllables – sounds into words
- Segmenting words into sounds –associate sounds with letters
- Identify beginning sounds - identify middle sound- identify ending sound
- Produce words that rhyme - Identify words that rhyme
- Substitute sounds in words - Delete sounds in words

   Most complete in preschool

Theoretical Perspectives

- Robert A. Pieretti, PhD, CCC-SLP
  California State University, Sacramento
Why FONEMZ Works

- The 2 neural systems for language and images are reinforcing and interrelated. (Gardener, 1979; Menard, Kosslyn, Thompson, Alpert, & Rauch, 1996)
- Reaction times to instructions are faster with image association. (Paivio, 1986)
- Children rely on imagery for long term memory retrieval. (Kosslyn, 1976)

Why FONEMZ makes sense: Articulation and Phonology

- Severe articulation errors/phonological processes may be representative of a weaker phonological system. These errors may be the symptom of the underlying problem. Targeting phonology itself is often more effective. (Fey, 1985; Hodson, 1992; Hodson & Edwards, 1997)
- The FONEMZ approach recognizes this and attempts to target articulation in a phonologically rich environment. Inherent focus on the sound system. Unique visual aspect, however...

Why do FONEMZ symbols make sense?

- Think about speech and language development:
  - The brain is a pattern seeker
  - Children constantly seek to match patterns produced by more advanced speakers
  - Trying for a “goodness of fit”; to “match a model”
  - Constantly working toward an ideal representation

Credit to Candace Goldsworthy, Ph.D., California State University, Sacramento
Why do FONEMZ symbols make sense?

- The work of Elizabeth Bates and her colleagues, beginning with *The Emergence of Symbols* (Bates et al., 1979).
- More simplistic productions precede accurate productions. Both carry the same symbolic meaning.
- FONEMZ “orthography” mirrors this phonological and oral language symbol development noted in infancy.
- A more simplistic symbol precedes the accurate orthographic symbol (example….)
- Visual difference makes auditory difference clear.

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Early Oral Language Problems & Later Reading Problems: Missing Links to Literacy

- Children can make the best improvement in phonological awareness when they receive the training prior to first grade (NRP, 2000).

- Instruction in phonemic awareness is beneficial to all types of children, whether typically developing or disabled (NRP, 2000).

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Early Oral Language Problems & Later Reading Problems: Missing Links to Literacy

- It is harder for disabled readers than for normal readers to acquire phonological awareness skills, but even they can improve their phonemic awareness with training [National Reading Panel (NRP), 2000]

- Children with phonological disorders have better outcomes than children with phonological disorders AND an additional language problem (Lewis et al., 2000)
Audio & Video Recording

- If a picture tells a thousand words, then a video recording is worth zillions.
- Video images of yourself are enthralling and revealing. Audio is similar but not as much for non-auditory learners.
- iPad recordings allow for immediate playback and self evaluation. Better than a mirror. Works with all disabilities: . . .

What Makes a Good Tool?

The same principles we use in our tried and true therapy techniques should be used to choose the best app:

- Interactive- provides opportunity for language expansion, modeling, and discussion.
- Promotes joint attention within a group
- A multisensory, multimodal approach - visual, tactile, auditory…
- Follows appropriate task hierarchy, able to customize - easy to hard to facilitate understanding.
- The ability to fade cues.

Articulation Station
By Little Bee Speech

- ONLY ARTICULATION APP THAT OFFERS PRACTICE AT WORD, SENTENCE AND STORY LEVEL
- MULTIPLE USERS FOR GROUP SESSIONS UP TO 6 STUDENTS AT ONE TIME, MAKES IT EASY TO DIFFERENTIATE WITHIN A GROUP
- DATA TRACKING FOR EACH STUDENT
- VOICE RECORDING AND PLAYBACK FEATURE
- E-MAIL PROGRESS NOTES
Demo with FONEMZ
& Articulation Station

FONEMZ Efficacy Study:
Research Design & Results

- Razi Zarchy, M.S.
  Yolo County Office of Education
  Graduate: California State University, Sacramento

Al: Results

Withdrawing of all articulation therapy: (2nd set of "A" Sessions):
Increased accuracy of target phoneme stays consistent into this period +
generalization to non-target phonemes
Al: Results

ANOVA Analyses

- **Phoneme**: There were statistically significant differences (F = 136.93, p < .0001**) in percentage of accurate phoneme production, particularly for the target phoneme and one untrained phoneme (/t/).
- **Session**: The effect of sessions was also significant (F = 24.93, p < .0001**).
- **Phoneme by Session**: The interaction of phoneme by session was also significant (F = 7.54, p < .0001**). Post Hoc Analyses revealed that the FONEMZ sessions had most effect on accuracy of productions, particularly for the target phoneme and the untrained phoneme (/t/).

Al: Post-tests

- **AAPS-3**:

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<tr>
<th>Diagnosis</th>
<th>Before the Study</th>
<th>After the Study</th>
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<tr>
<td>Severe deficiency in articulation</td>
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<td>Moderate deficiency in articulation</td>
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<tr>
<td>Score:</td>
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- **PreK-PALS**:

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<th>Section</th>
<th>Score Before Study</th>
<th>Score After Study</th>
<th>Range for Early Reading Success</th>
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<td>Letter Sounds</td>
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<td>4-8</td>
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<tr>
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<td>6-10</td>
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</table>
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Testimonial of Research on website
www.fonemz.com

REFERENCES