Computer-Assisted Instruction to Support Special Education Pedagogy for Students with Autism

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What is CAI?

- Any technology that provides the specialized instruction
- Can be used in separate settings and inclusive settings
- Addresses barriers to inclusion or high-quality instruction
  - Using already available software decreases cost
  - Individualized to meet student needs
  - Customized to match student preferences and interests

Characteristics of Effective CAI Interventions
- Effective studies use principles of systematic instruction
  - Stimulus prompting
  - Error correction and feedback
  - Delay intervals
  - Stimulus fading (Knight et al., 2013)
- Provides multiple examples and immediate feedback to students
  - Graphics, photographs, audio, text, and video (Hutcherson et al., 2004)

- CAI studies to date:
  - 5 science terms and applications of those terms (Smith, Spooner, & Wood, 2013)
    - Did not include video instruction
  - 5 parts of an amoeba and their function (McKissick, Ley Davis, Spooner, Fisher, & Graves, 2018)
    - Included video instruction
  - 3 transition Skills (McKissick, Rivera, & Adams, 2022)
    - Cleaning up biohazardous waste, food safety, and work-place scenarios
    - Included video instruction

How Can CAI Support Rural Special Education?

- Addresses a lack of resources Does not require expertise in special education pedagogy for general educator
  - Does not require special educator to have content area expertise
- Provides a high-quality activity for students so teachers can attend to other responsibilities
- Technology can combat geographic isolation

(Berry et al., 2011; Brownell et al., 2005; Hammond & Ingals, 2003; Howley et al., 2011)

Details of the Latest Intervention…

- Implemented by a special education undergraduate during internship

- Each CAI package consisted of 30 slides including:
  - Introduction video (provides context)
  - My turn, Your turn explicit instruction slides
  - Instructional videos
  - Reinforcement slides

- Embedded instructional videos and graphics
  - (Example) Step 5 for cleaning up bodily fluids is: put on mask and gloves and includes a video of how to properly put on and take off latex gloves without contaminating anything else
  - Videos included narration and animations by researcher
  - Varied in length (45s-90s)

- Yellow star animation highlighted the correct response on explicit instruction slides if Ray selected the incorrect answer OR did not respond within 4s

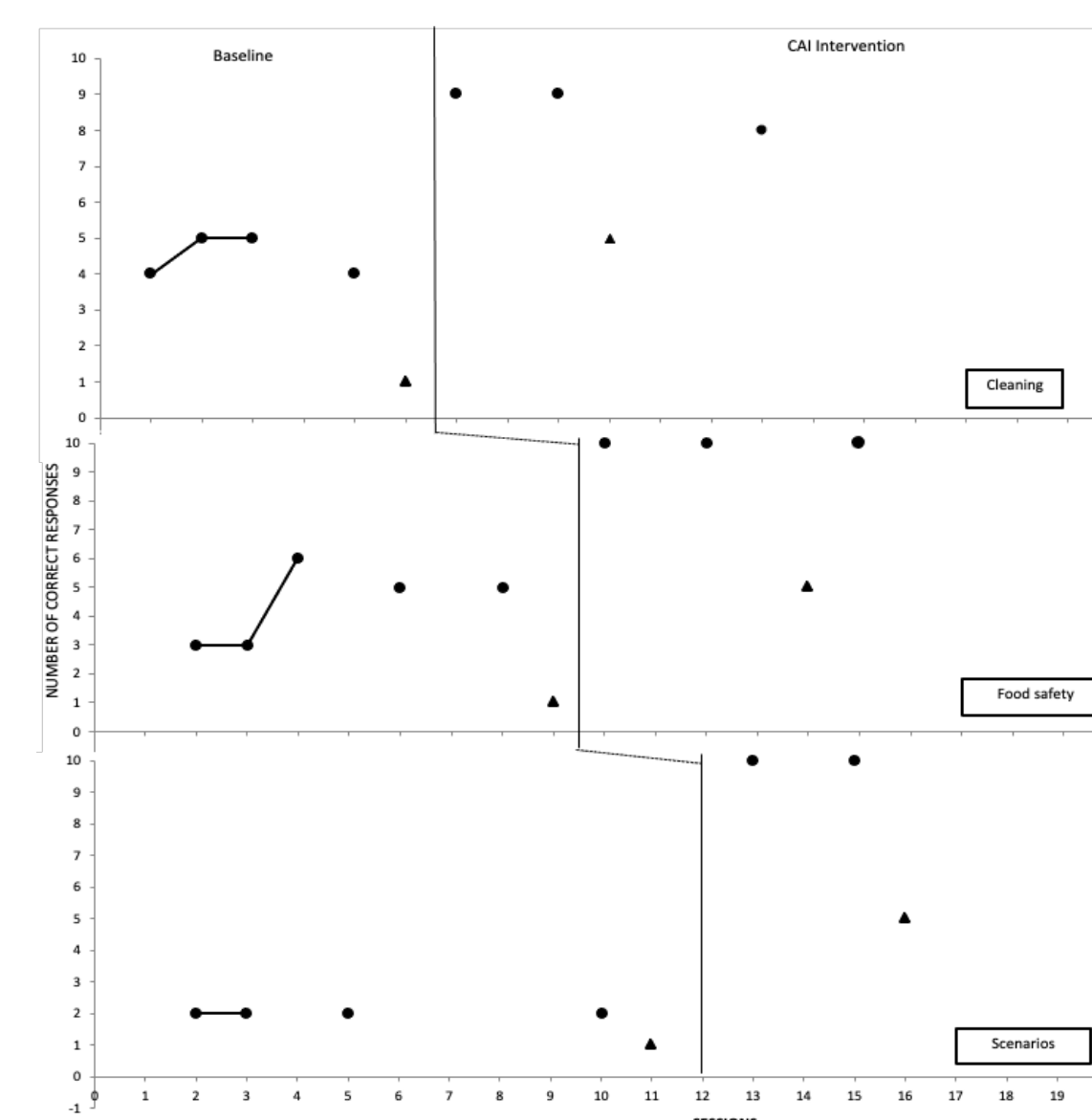- Three reinforcement slides included in each CAI package

Effectiveness Data

Without Videos Data (Smith et al.)
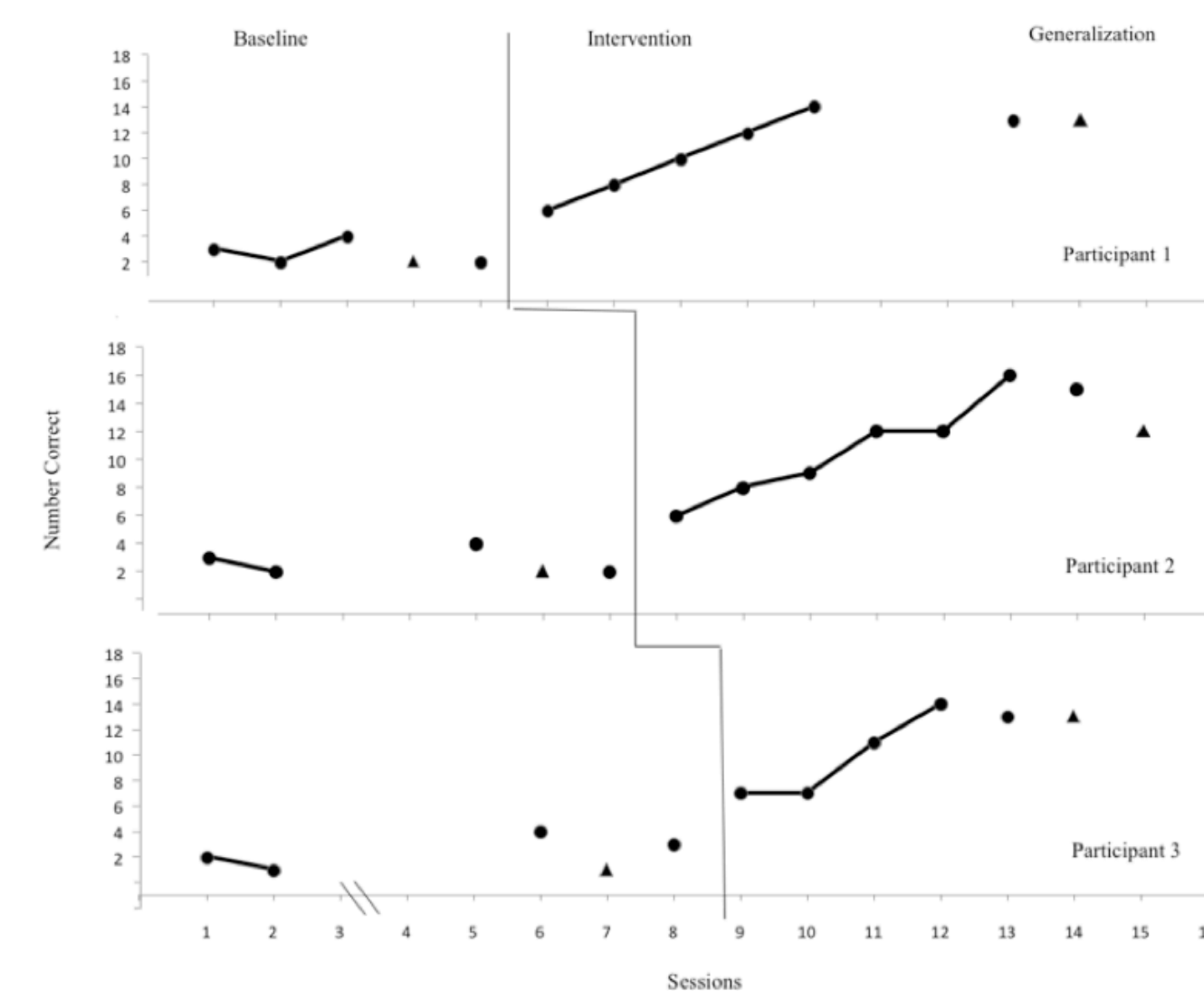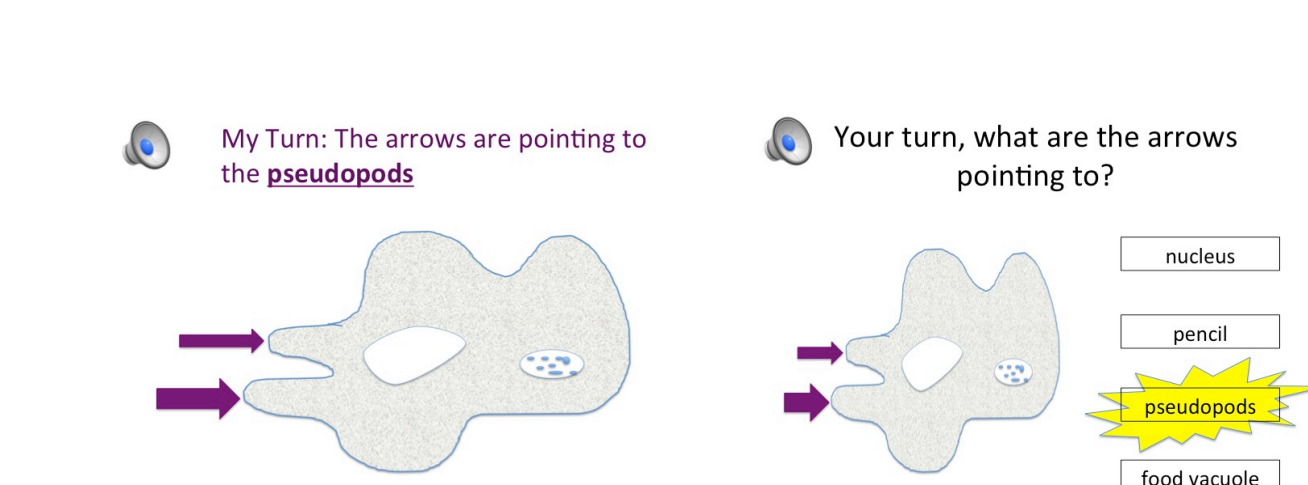

With Videos Data (McKissick et al.)

CAPTURE YOUR HORIZON
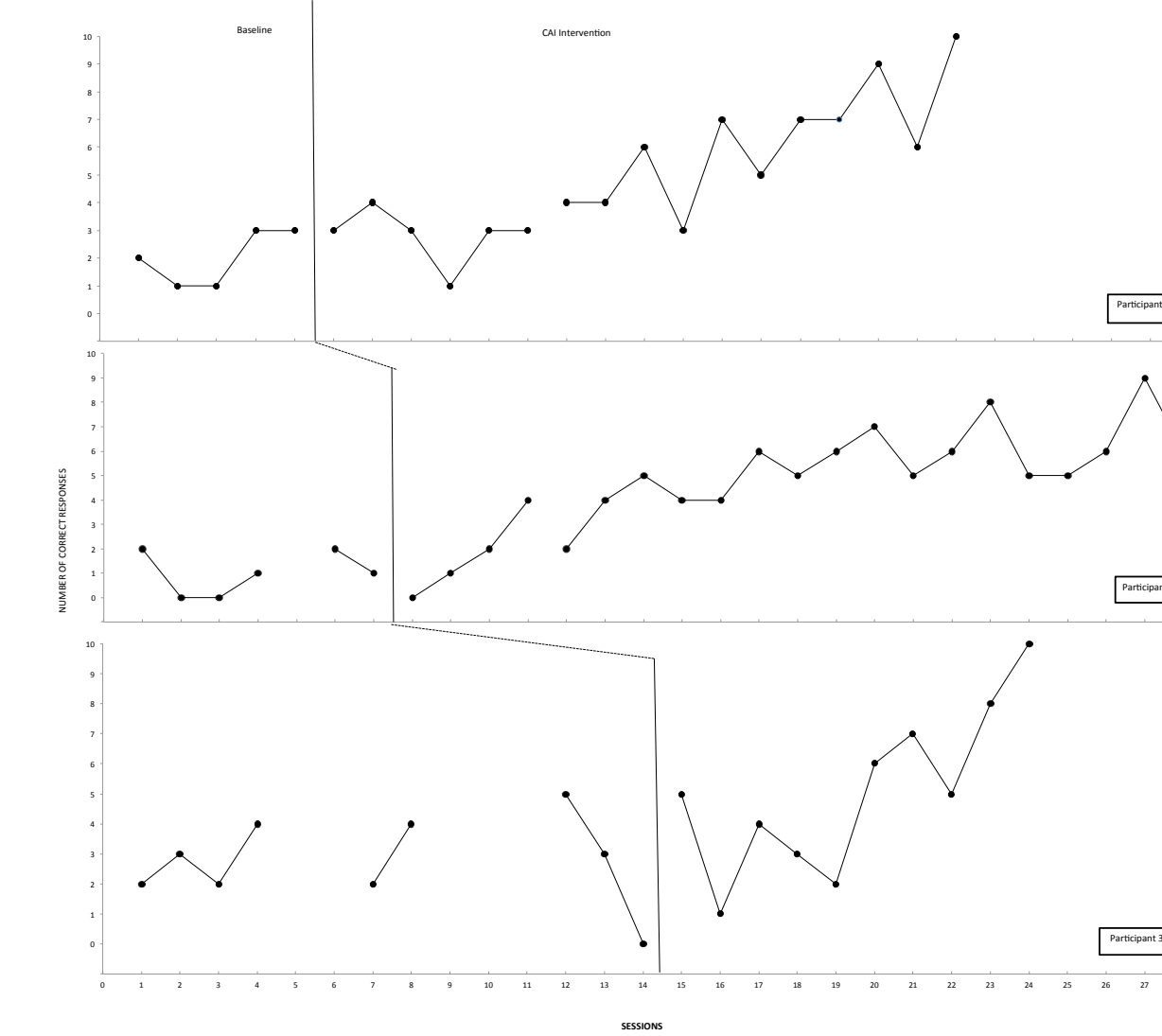
With Video Data (McKissick et al., 2022)
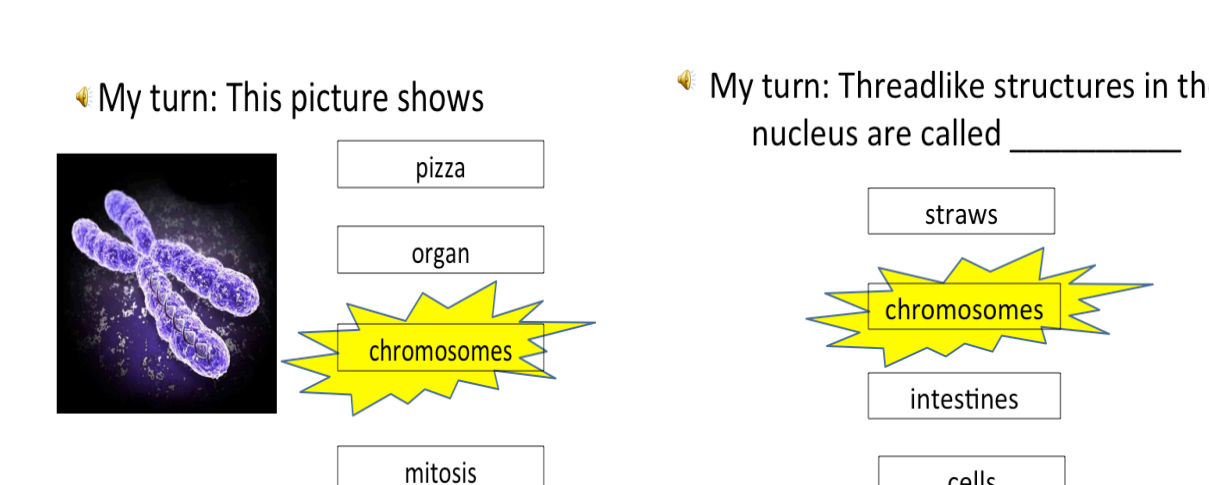
Sample Intervention Slides

Intervention Slides

Intervention Slides

Click exit on **map**
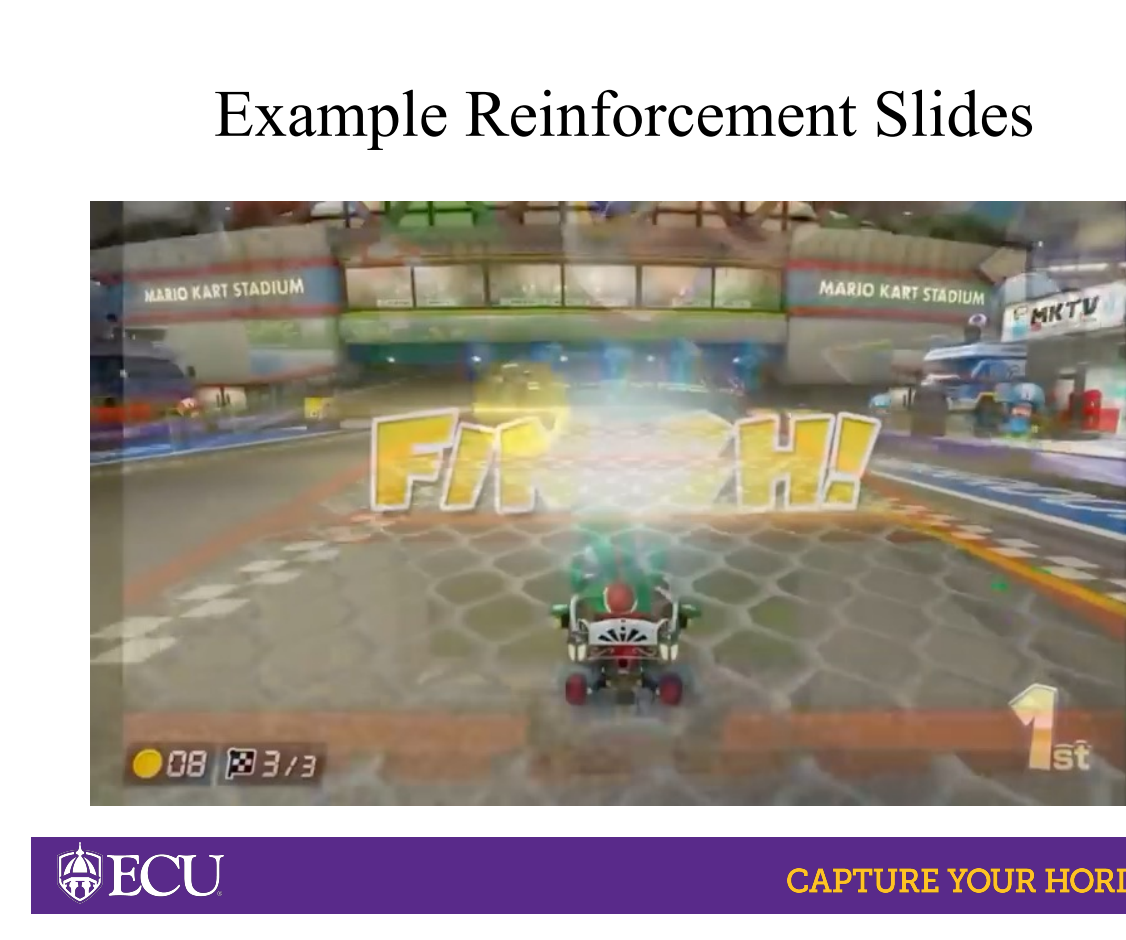
Embedded and Individualized Reinforcement

That's Right!

That's Right!

Example Reinforcement Slides

Next Steps

- CAI to teach chained skills within real-world contexts
  - Making observations
  - Navigating changing environments
- Implementation in general education classroom
  - Collaborative Pre-teaching
  - Does it impact participation and engagement?
  - Does it change teacher perceptions?
- Teacher created CAI
- Student created CAI
- Feasibility and usefulness in remote instruction

CAI Scholarship with Student Collaborators

McKissick, B. R., Rivera, C. J., & *Adams, M. (2022). *Applications of computer-assisted instruction: Teaching transition skills to a student with autism and intellectual disability* [Manuscript in preparation]. Department of Special Education, Foundations, & Research, East Carolina University.

Rivera, C. J., **McKissick, B. R.,** & *Adams, M. (2020). edTPA: Assisting rural special education teacher candidates to incorporate self-regulation skills in planning and instruction. *Rural Special Education Quarterly*, *39*(3), 167-175. doi: 10.1177/8756870520932919

McKissick, B. R., Ley Davis, L., Spooner, F., Fisher, L. B., & *Graves, C. (2018). Using computer-assisted instruction to teach science vocabulary to students with autism spectrum disorder and intellectual disability. *Rural Special Education Quarterly*, *37*, 207-218. doi: 10.1177/8756870518784270

McKissick, B. R., Diegelmann, K., & *Parker, S. (2017). Using technology to address barriers in rural special education for students with autism: A do-it-yourself guide. *Rural Special Education Quarterly*, *36*, 155-159. doi: 10.1177/8756870517707712

*Thornton, A., **McKissick, B. R.,** Spooner, F., Lo, Y., & Anderson, A. L. (2015). Effects of collaborative preteaching on science performance of high school students with specific learning disabilities. *Education & Treatment of Children*, *38*, 277-304. doi: 10.1353/etc.2015.0027

Teaching Philosophy

- Inclusivity and Equity
  - Special education is a service, not a place
  - Least Dangerous Assumption = assumed competency
  - Provide full educational opportunities grounded in culturally responsive teaching pedagogy
  - The goal is authentic connections
    - Mentoring and supporting future scholars of color

- Research-based Pedagogy
  - Teaching strategies grounded in systematic instruction and applied behavior analysis (evidence-based practices for the special education field)
  - Maintain active research agenda and disseminate finding in top tier special education journals and conferences
  - Embed course assignments where special education majors create CAI and other interventions with special education students within practicum and internship settings

- Reflective Inquiry
  - Establish reciprocal relationships between me and the students I serve
  - Facilitative approach where I support students critical thinking and pose questions to help them formulate their approach
  - Provide suggestions and guiding questions to support problem-solving
  - The goal is to create critical consumers who are pedagogically strong special educators