NTACT
National Technical Assistance Center on Transition

IDEAs that Work
U.S. Office of Special Education Programs

Using Structured-Inquiry to Teach Science Content

What is the level of evidence?

- This is a research-based practice based for **students with disabilities** based on one methodologically sound group experimental study with random assignment and one methodological sound single-case study across 205 students with disabilities.

Where is the best place to find out how to do this practice?

The best place to find out how to implement structured inquiry to teach science content is through the following research to practice lesson plan starters:

- Using Structured Inquiry to Teach Environmental Science (Mastropieri et al., 1998)

With whom was it implemented?

- Students with
  - Intellectual Disability (1 study, n=2)
  - Down Syndrome (1 study, n=1)
  - Other-not specified (1 study, n=205)

- Ages ranged from 13-19 years of age
- Gender
  - Males (n = 127)
  - Females (n = 78)
- Ethnicity
  - African-American (n = 69)
  - White (n= 64)
  - Hispanic (n= 62)
  - Asian (n= 5)
  - Not Reported (n=5)

What is the practice?

Structured-inquiry has been defined as "structured hands-on experiments, student collaboration to make and share predictions, teacher formative feedback, and student writing and/or drawing to summarize the findings (Therrien et al., 2011, p. 191)."

Inquiry based methods have been used to teach the following science subjects:

- Chemistry (Lynch et al., 2007)
- Matter (McCarthy, 2005)
- Magnetism and electricity, and rocks and minerals (Scruggs et al., 1993)

Where has it been implemented?

- General education classroom (1 study)
- Self-contained classroom (2 studies)

How does this practice relate to Common Core Standards?

- CCSS.ELA-LITERACY.RST.6-8.2 - Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.
- CCSS.ELA-LITERACY.RST.6-8.3 - Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.

How does this practice relate to the Common Career Technical Core?

- Career Ready Practices
    2. Apply appropriate academic and technical skills.
    7. Employ valid and reliable research strategies.
    8. Utilize critical thinking to make sense of problems and persevere in solving them.

References used to establish this evidence base:

Lynch, S., Taymans, J., Watson, W. A., Ochsendorf, R. J., Pyke, C., & Szesze, M. J. (2007). Effectiveness of a highly rated science curriculum unit for students with disabilities in general education classrooms. *Exceptional Children, 73*, 202-223.

Miller, B., Doughty, T., & Krockover, G. (2015). Using science inquiry methods to promote self-determination and problem-solving skills for students with moderate intellectual disability. *Education and Training in Autism and Developmental Disabilities, 50*(3), 356-368.

Additional References Used:

Therrien, W. J., Taylor, J. C., Hosp, J. L., Kaldenberg, E. R., & Gorsh, J. (2011). Science instruction for students with learning disabilities: A meta-analysis. *Learning Disabilities Research & Practice*, *26*, 188-203.

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