Geometry and Tactile Graphics for Students in Grades 3 to 8

Lesson 7: Strategies for Developing Students' Thinking Skills

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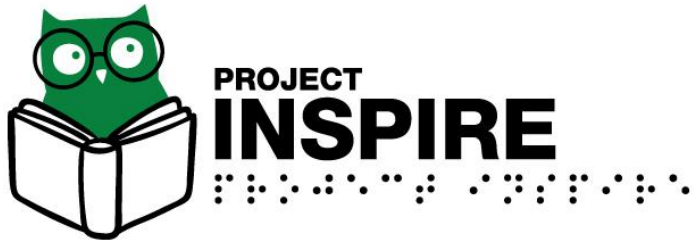

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Lesson 7 Objectives

Participants will be able to:

1. Identify different ‘types’ of thinking and how they help to develop self-regulated learning that can be applied to reading graphics
2. Describe ways to infuse thinking opportunities into instruction with tactile graphics

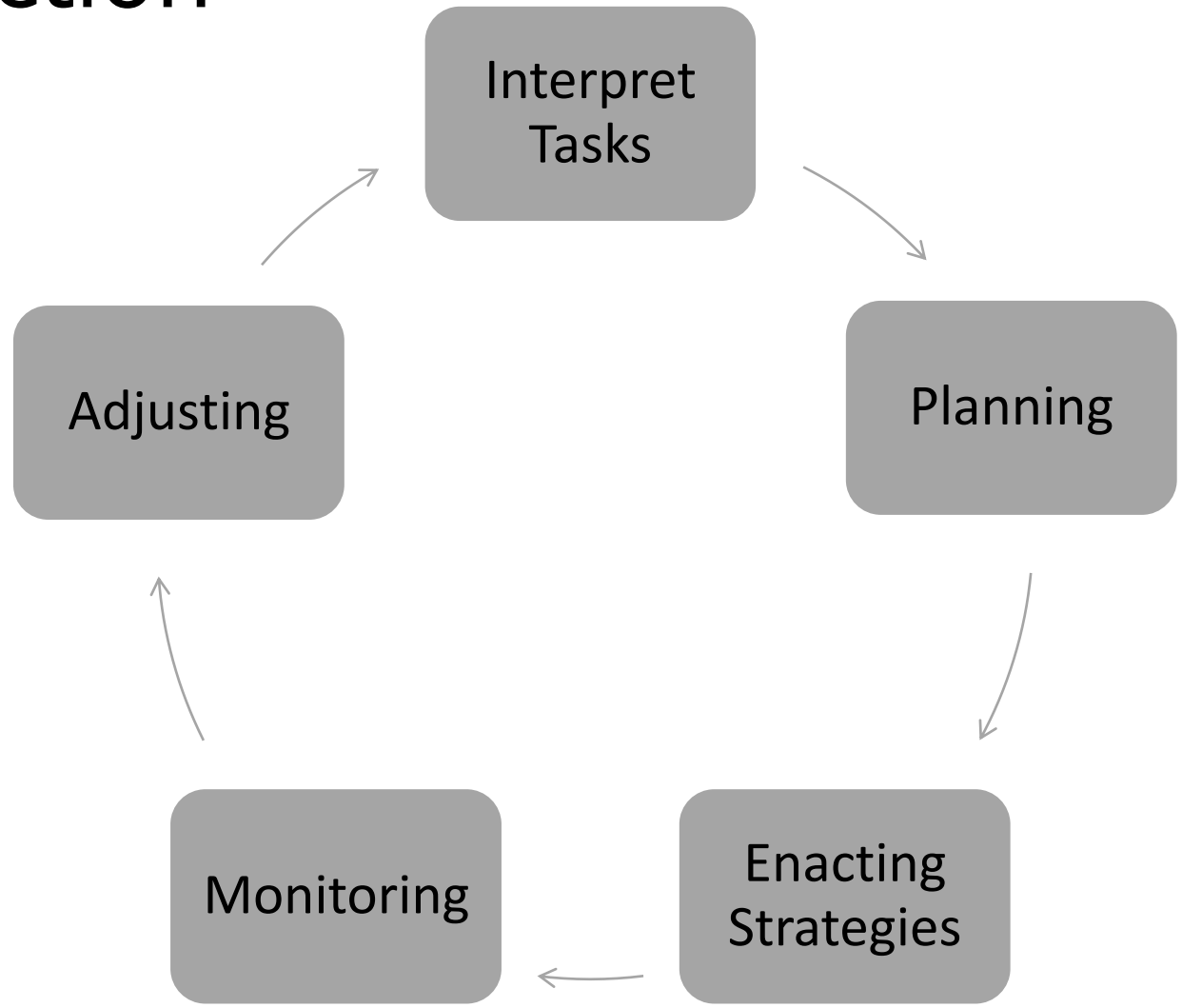
Why Deliberately Think about Thinking?

- Incorporating opportunities for thinking “on the fly” rarely works
- Thinking skills can transfer across content areas and life tasks
- Promoting active engagement

Types of Thinking

- Flexible
  - Can I think differently about a situation?
  - Can I assume the viewpoint of someone else?
- Fluent
  - Can I come up with various solutions?
  - Can I identify a variety of tools to accomplish a procedure or solve a problem?
- Elaborative
  - Can I take what I know and add to it?
  - Can I analyze and compare to come up with the next steps?
- Original
  - Can I come up with new and different ideas?

Becoming Self Regulated Learners: Cycle of Strategic Action



(Butler & Schnellert, 2015)

Learner's Engagement Depends On:

- Learning environment
- Emotions and motivation
- What the learner brings to the task (metacognition, knowledge, experiences, strengths and challenges, beliefs, etc.)

(Butler & Schnellert, 2015)

Questions to promote thinking about strategic action

- Interpret Activities
  - What do you need to do?
  - How will you know you did a good job?
- Choosing Strategies
  - What has worked in the past?
  - What strategy did you use there?
  - How will you approach this task (what's your plan)?
- Monitoring and Adjusting
  - How are you doing? How do you know?
  - What can you do differently to solve the problem?

Building Strategy Tool Box

- Hits all categories of thinking
- Prompts to build the skill:
  - What else could you do?
  - How did that strategy compare to the other?
  - You had trouble with X using that strategy, how could you modify?

Strategy 1: Opportunities to Compare and Contrast

- Categorize on different features (flexible thinking)
- Try different strategies and evaluation which was more effective
- Examples for graphics:
  - Compare one bar graph to another- What is the same (salient feature of a “bar graph”)
  - Make a group of graphics the student explores to figure out why they were grouped together (e.g., all have a key, all have X and Y axes, etc.)
  - Try different techniques for exploring the graphic

Shape Sort Example

- Practice flexible thinking
- Practice compare and contrast skills
- Has to analyze and make a plan vs. just being asked to make groups based on a feature

Strategy 2: Open Up Directive Teaching by asking more questions

- Directive teaching:
  - Teaches a rote process or procedure
  - Students work on following directions
- Open-ended opportunities:
  - Provide insight into the student's thinking
  - Provides more "ownership" of the task to the student
  - Additional opportunities to analyze, brainstorm, compare, etc.

Tactile Book- Directive

- Student followed directions
- Practice exploring a tactile picture
- Opportunity to correct technique

Tactile Book Example- More Open

- Questions give the student an opportunity to predict and make connections
- Provides insight to the teacher (before telling the student) what student can do on own and the approach they take
  - Check this out, what do you notice?
  - How did you figure that out?
  - What would you expect to find? Why?
- Provides opportunities to give feedback on strategies used

Strategy 3: Think Aloud

- Teacher Think Aloud- models metacognition, strategic action cycle and learning as a process with mistakes part of it

- Student Think Aloud- draws the student's attention to the process, provides additional insight to the teacher

Prompts to develop think aloud skills

- What did you do to figure that out?
- What's your plan?
- What can you do to make sure?
- Why did you select that strategy?

Tips for Improving Questioning and Student's Thinking Skills:

- Record yourself teaching a student!
- Pre-plan higher level questions
- Ask why and how often!
- Provide frequent opportunities to engage in the whole strategic action process
- Focus on process vs. outcome with your feedback

Thank You

Reference

- Butler, D. L., & Schnellert, L. (2015). Success for students with learning disabilities : What does self-regulation have to do with it? In T. Cleary (Ed.), S*elf-Regulated Learning Interventions With At-Risk Youth: Enhancing Adaptability, Performance, and Well-Being.* Washington DC: APA Press.