Five Things ANYONE Can Do To Improve Student Achievement

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SCORE!

5 THINGS ANYONE CAN DO TO IMPROVE STUDENT ACHIEVEMENT
WE MUST FIRST REDEFINE "GRAPHIC ORGANIZER"

Write a definition of graphic organizer that includes a reference to working memory:

"Learning aids in the ordinary classroom...can be used as off-loading devices when learners want to solve a problem easily or retain information longer. If a learning task has a cognitively demanding procedure...learners can handle their limited cognitive resources more efficiently by offloading parts of the cognitive task onto tools that are available in the physical environment" (Wilson 2002).
APPEARANCE OF TEXT on the page affects student achievement more than: scope, depth of knowledge, vocabulary complexity, or inference reliant questions.

read to learn
simplify the text on the page

- Use only one column
- Eliminate distracting graphics
- Choose a sans serif font
- Widen margins
- Control line length

Use a tri-panel folder or "viewing frame" to separate a text book or STAAR passage into less distracting chunks.

assessment
format questions considerately

- Position questions close to referent
- Format answer choices in list form
- Avoid front/back copies

STAAR Online uses pop-ups to reduce the need for flipping "pages" or searching for the referent.

"There has been a shift toward Universal Design of assessments, where the underlying principle is that the design of an assessment should be accessible to the largest number of students possible, thereby reducing the need for accommodations or other adaptations."

"If working memory can be partially divided into auditory and visual components, available capacity to deal with information may be increased by using both processors rather than a single processor.

If, in addition, we have evolved to use both processors simultaneously, the advantage may be increased further. When all information must be processed by the visual-spatial sketchpad, it may be prone to overloading. By shifting some of the load to the phonological loop, learning may be enhanced."

Noise, whether visual or auditory, can be considered as a typical irrelevant stimulus that takes limited WM resources away from the learners’ cognitive process (Choi 2014).

For example, in a noisy classroom environment, children are more likely to give up on a puzzle task than children in a quiet classroom environment (Cohen et al. 1980). Evans and Stecker (2004) also showed that noise can lead to diminished motivation, feelings of helplessness, and consequently result in lower learning outcomes.

Although learners are able to exclude irrelevant environmental stimuli from the information processing cycle themselves by an effortful suppression process, this process imposes a load on the executive component of WM and can better be prevented (E. E. Smith and Jonides 1999).

“Excluding irrelevant stimuli from the environment through eye-closure reduces unproductive WM load and improves performance by freeing WM resources that would otherwise have been involved in monitoring the environment. Glenberg et al. (1998) provided another demonstration of this phenomenon in the visual system by showing that memory retrieval could be improved when subjects averted their gaze from their environmental surroundings during cognitively difficult tasks. In fact, gaze aversion has been identified as a way of managing the WM load associated with the processing of visual environmental information.”

"From the perspective of CLT, if the physical environment is a causal factor of cognitive load, it can play a role in the management of cognitive load and thus be regarded as a determinant for learning and performance."

What factors contribute to the extraneous cognitive load within the environment? Consider "teacher factors" and instructional practices.

Mitigation

How can that extraneous load be mitigated?
"One solution that can reduce the impact of spoken text is to **subdivide it into smaller segments**, thus reducing the negative impact of increased cognitive load because of transience of information and allowing students increased opportunities to process this information" (Singh 2012).

**Strategies That Promote Segmentation**

In **written text**, providing a single double spaced blank line between concepts or topics increased scores in both recall and transfer assessments.

In **spoken text**, providing a 5 second pause between concepts or topics increased scores in both recall and transfer assessments.

**Segmenting**

**Application:**

- **Lesson → processing breaks**
  - Think-Pair-Share
  - Visualization
  - Mental Rehearsal

- **Reading → processing space**
  - Summarize
  - Nonlinguistic Representation
  - Key or Repeated Words
  - Rate Comprehension (1-5 or V/X)