Infusing Research-Based Study Skills into First-Year Classes: What Works?

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Teaching Influences Study Behaviors

Learning focused teaching approaches were linked to higher levels of student self-regulation

Donche et al. (2013)
Turn and Talk

What are some effective and ineffective study strategies?

Study Strategies

Effective
- Multi-Sensory Learning
- Testing Effect
- Teaching
- Organizing

Not as Effective
- Learning Styles
- Reviewing or rehearsal
Multi-Sensory Learning

We are ALL Multi-Sensory Learners

Goswami (2008); Mayer (2009)
Lack of Research for Learning Styles

Pashler, McDaniel, Rohrer, & Bjork (2008); Rohrer & Pashler (2012)

Prediction:
Which “sense” has the most research support?

Pashler, McDaniel, Rohrer, & Bjork (2008); Rohrer & Pashler (2012)
Images are Powerful!

(McBride & Dosher, 2002)

Less is More!

Mayer (2009)
Draw Attention to Important Concepts

Mayer (2009)

The “Be Quiet” Principle (also known as the Redundancy Principle)

Mayer (2009) brings attention to the fact that when you have a visual aid such as a Power Point slide that contains a lot of words (like this one!), it makes it difficult for the student to process the information. There are competing channels fighting for attention. You want to listen and you want to read. You end up trying to both and not doing either one very well. He argues that because images are so powerful it is often best to use an image as a backdrop to your narration. If you need to use a lot of words on a slide, then “be quiet” (these are my words not Mayer’s words!) and let them read it. Then, you can explain it more once they are finished reading.
Use Conversational Language rather than Formal Language

Research into Practice: Professor Actions

- Consider what method will work best for your content
- Use these principles to develop your Power Point slides
- Focus student attention on visual aids
- Encourage students to use visual images when creating study guides

Mayer (2009)
Testing Effect

An Experimental Study
Roediger, & Karpicke (2006)

Study Technique

Retention of Information

180 college students

SSSS
SSST
STTT

S = Study; T = Test
Prediction:

Which group (SSSS; SSST; STTT) performed the best?

Retrieval is a MEMORY tool!!!

Roediger & Karpicke (2006)
But....

Reviewing is the most commonly used study approach (even though it’s not as effective!).

Illusions of Competence

Students who simply studied thought they did the best but they did not!

Gurung (2005)

Karpicke & Blunt (2011)
Teaching about the Testing Effect
Einstein, Mullet, & Harrison (2012)

Will participating in a demonstration of the testing effect increase the use of testing as a study strategy?

Testing effect- Testing yourself is a very powerful way to remember

The Study
Einstein, Mullet, & Harrison (2012)

Who? 52 college students taking an upper level course on Memory

<table>
<thead>
<tr>
<th>Study-Study</th>
<th>Study-Test</th>
<th>Self-Assessment</th>
<th>Presentation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Read and Study passage 4 minutes</td>
<td>Read and Study passage 4 minutes</td>
<td>How well did you remember the content?</td>
<td>20 Minutes on Testing Effect</td>
</tr>
<tr>
<td>Read and Study passage 4 minutes</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The Results
Einstein, Mullet, & Harrison (2012)

Students were **MORE** likely to **USE TESTING** as a study tool after this demonstration!

- **67%** used testing during reading
- **82%** used testing strategy when studying

But... Students thought they did equally well
Quiz Your Students

• Weekly quizzing
• Testing until you get it correct

Landrum (2007); Di Hoff, Brosvic, & Epstein (2003); Epstein, Epstein, & Brosvic (2001)

An Alternative to the “Pop Quiz” - Random Quizzing Works!

Ruscio (2001)
Research into Practice: Professor Actions

- Teach students about the testing effect
- Quiz your students
- Require or encourage use of online practice quizzes
- Encourage students to use flashcards or create quizzes

Teaching Others
Learning is Social

Peer Teaching: Improves Learning

- Improves learning
- Positive learning experience

Galbraith, & Winterbottom (2011); Srivastava et al. (2015)
Peer Teaching: Improves Confidence

Johnson, Robbin, & Loui (2015)

Study Groups

Hendry, Hyde, & Davy (2005); Schmidt & Moust (1998)
But....

Do they “know” enough to be teaching the content to others?
Turn and Talk

How can we help students get the most out of peer learning?

Novices vs. Experts

- Novices focus on the details instead of the big picture
- Experts make more inferences
- Prior knowledge increase accurate inferences

Background Knowledge and Reading
Recht and Leslie (1988)

<table>
<thead>
<tr>
<th></th>
<th>High Baseball Knowledge</th>
<th>Low Baseball Knowledge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good reader</td>
<td>31.4</td>
<td>18.8</td>
</tr>
<tr>
<td>Poor Reader</td>
<td>27.5</td>
<td>13.9</td>
</tr>
</tbody>
</table>

Research into Practice: Professor Actions

- Mini-lectures BEFORE assigning reading
- Teach students reading strategies
- Emphasize important points
- Use class time for peer learning (Jigsaw Classroom)
- Encourage study groups
Prediction:

Does how long you study or how you study matter more?
The Study
Dickinson and O’Connell (1990)

113 Undergraduate Students

Recorded Study Time and Strategy WHILE studying

Reading
Reviewing
Organizing

Test Grade

The Results!
Dickinson and O’Connell (1990)

![Graph showing total time studying and test grade correlation for low and high performers.]

Low Performers
High Performers

Total Time Studying
The Results!
Dickinson and O’Connell (1990)

Defining Organizing
Dickinson and O’Connell (1990)

- Put information into your own words
- Create links between concepts via a hierarchical structure
- Create examples to help concepts come alive
Research into Practice: Professor Actions

• Providing organizational structure
• Explicitly making connections
• Concept maps
• One Minute Papers - Summarize in your own words

The BEST Learning Strategies

Use Visual Images
Test Yourself Over and Over
Teach Someone and Study Together
Organization
Thank You!

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