Metacognition: The Key to Acing Courses, Passing Cumes & General Exams, and Making Great Presentations!

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How do I KNOW Metacognition Works?

I wrote the book on it!
And I have examples to prove that it works!

Just out in January 2018
A Book for Students

Presidential Recognition
White House Oval Office
November 16, 2007
# LSU Analytical Chemistry Graduate Student’s Cumulative Exam Record

<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>9/04 Failed</td>
<td>10/05 Passed</td>
</tr>
<tr>
<td>10/04 Failed</td>
<td>11/05 Failed</td>
</tr>
<tr>
<td>11/04 Failed</td>
<td>12/05 Passed best in group</td>
</tr>
<tr>
<td>12/04 Failed</td>
<td>1/06 Passed</td>
</tr>
<tr>
<td>1/05 Passed</td>
<td>2/06 Passed</td>
</tr>
<tr>
<td>Began work with CAS and the Writing Center in October 2005</td>
<td></td>
</tr>
<tr>
<td>2/05 Failed</td>
<td>3/06 Failed</td>
</tr>
<tr>
<td>3/05 Failed</td>
<td>4/06 Passed last one!</td>
</tr>
<tr>
<td>4/05 Failed</td>
<td>5/06 N/A</td>
</tr>
</tbody>
</table>
What did Algernon develop to significantly increase his success?

- Metacognitive Learning Strategies
- Reading Comprehension
- Problem Solving Skills
- Increased Confidence
Metacognition

The ability to:
• think about your own thinking
• be consciously aware that you are a problem solver
• monitor and control your mental processing (e.g. “Am I understanding this material?”)
• accurately judge your level of learning
• know what you know and what you don’t know
Reflection Questions

• What’s the difference, if any, between *studying* and *learning*?

• For which task would you work harder?
  A. Make an A on the test
  B. Teach the material to the class
To Thrive in Graduate School

• Stay in *learn* mode, not *study* mode

• Study as if you have to *teach* the material, not just make an A on the test
Power of Teaching to Master Learning
Clint’s Story: Baby Groot and the Exam

Guardians of the Galaxy

- First encounter on October 29, 2015
- Email on January 18, 2016
- Msg on April 14, 2016
- Msg on June 11, 2016

https://www.youtube.com/watch?v=BEPbXYzE5_Y
Bloom’s Taxonomy

- **Remembering**: Retrieving, recognizing, and recalling relevant knowledge from long-term memory.

- **Understanding**: Constructing meaning from oral, written, and graphic messages through interpreting, exemplifying, classifying, summarizing, inferring, comparing, and explaining.

- **Applying**: Carrying out or using a procedure through executing, or implementing.

- **Analyzing**: Breaking material into constituent parts, determining how the parts relate to one another and to an overall structure.

- **Evaluating**: Making judgments based on criteria and standards through checking and critiquing.

- **Creating**: Putting elements together to form a coherent or functional whole; reorganizing elements into a new pattern or structure through generating, planning, or producing.

This pyramid depicts the different levels of thinking we use when learning. Notice how each level builds on the foundation that precedes it. It is required that we learn the lower levels before we can effectively use the skills above.

[http://www.odu.edu/educ/llschult/blooms_taxonomy.htm](http://www.odu.edu/educ/llschult/blooms_taxonomy.htm)
How do you move higher on Bloom’s Taxonomy?

Use the Study Cycle*

*adapted from Frank Christ’s PLRS system
THE STUDY CYCLE
The Path to Improving Study Techniques

START

CHECK
• Can I teach this material to someone?
• Are my study methods effective?

PREVIEW
• Before class, skim new material.
• Note big ideas.
• 5-15 minutes

STUDY
Schedule several focused study sessions per class each week.
• 30-50 minutes

ATTEND
• Go to class!
• Take notes.
• Ask questions.

REVIEW
• Reread notes.
• Fill in gaps.
• Develop questions.
• 10-15 minutes

FOCUSED STUDY SESSIONS
Focused study sessions (FSSs) are designed to work with the way your brain learns best: in short, focused increments. Schedule several focused study sessions per class each week.

PLAN
Decide what you will accomplish in your study session and get started.
• (Suggested time: 1 - 2 minutes)

STUDY
Interact with material: organize, concept map, summarize, process, re-read.
• (Suggested time: 30 - 50 minutes)

BREAK
Step away from material to clear your head.
• (Suggested time: 5 - 10 minutes)

RECAP
Go back over, summarize, wrap-up and check what you studied.
• (Suggested time: 5 minutes)

CHOOSE
• Should I continue studying?
• Should I take a break?
• Should I change tasks or subject?
Why is using the textbook so important? An activity will demonstrate this

• What word comes to mind when you see c_t?
• Would this word have come to your mind if we lived in a culture that had no cats and you’d never seen the word?
• Our brains automatically fill in missing information if we’re very familiar with the content (txt msgs)
• Does your brain have the info to fill in what’s missing in graduate courses?
• Will the test be written from what YOUR brain or the professor’s brain sees in the notes?
A Strategy for Getting the Most Out of Homework

• Study information before looking at the problems/questions
• Work example problems (without looking at the solutions) until you get to the answer
• Check to see if answer is correct
• If answer is not correct, figure out where mistake was made, without consulting solution
• Work homework problems/answer questions as if taking a test
How to Make the Homework Strategy Work Best

• Start the problems early--the day they are assigned

• Do not flip back to see example problems; work them yourself!

• Don’t give up too soon (<15 min.)

• Don’t spend too much time (>30 min.)
Chapter Maps Help to Master Concepts
Compare and Contrast Maps
Clear Up Confusion

Thermodynamic Control

How are they similar?

How are they different?

Kinetic Control
Use Metacognition to Ace Final Exams: It’s Not Over ‘Til It’s Over!

Prof. Isiah Warner’s Chem 2001 Class

<table>
<thead>
<tr>
<th>Class Average</th>
<th>Adam</th>
<th>Frederick</th>
<th>M’Famara</th>
<th>Stephanie</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test 1</td>
<td>76</td>
<td>65</td>
<td>77</td>
<td>70</td>
</tr>
<tr>
<td>Test 2</td>
<td>52</td>
<td>67</td>
<td>65</td>
<td>46</td>
</tr>
<tr>
<td>Test 3</td>
<td>72</td>
<td>61</td>
<td>68</td>
<td>68</td>
</tr>
<tr>
<td>Final</td>
<td>78</td>
<td>107</td>
<td>88</td>
<td>88</td>
</tr>
</tbody>
</table>

Date of Final Exam: December 14, 2005

Meeting with Adam: December 12, 2005

Meeting with Frederick and Stephanie: December 2, 2005

Meeting with M’Famara: December 8, 2005

The final was worth 100 points with a 10 bonus question.
You Can Ace Cumulative Exams!

Purpose of Cumes:

• Test your overall knowledge of a topic

• Test your ability to master a research article

• Test your ability to become a scholar
Tips for Acing Cumes

- Know what the the cume will cover

- If Research Paper
  - know info as if you were author
  - be able to “teach” information
  - look up everything!

- If General Topic
  - review the whys, hows, & what ifs
  - practice teaching the information
  - aim for 100% understanding
  - over learn information
Powerful Research Presentations: A Systematic Approach is the Key!
Outcomes

• You will understand the difference between powerful presentations and mundane ones
• You will have concrete strategies to help you develop a powerful presentation
• You will be committed to putting in the time and effort to develop a powerful presentation
• Your presentations will be enjoyable for both you and your audience
Complete the following sentence:

Three differences between an excellent presentation and a poor presentation are...
Attributes of Effective Presenters

Competence

and

Confidence

www.davidprice.com
The Amount of Preparation Makes All the Difference!

**Inadequate preparation** ➔ **poor presentation**

MIND THE GAP

**Sufficient preparation** ➔ **powerful presentation**
Giving A Powerful Presentation Involves the Following:

- A thorough understanding of the content
- A well organized presentation that tells a great story
- Excellent visuals; no mistakes!
- Practice, Practice, Practice!!!
Getting Started

- Talk with your advisor to determine the scope of your talk
- Develop the outline
- Decide what visuals you will include
The Outline

• Introduction
  Tell them what you’re going to tell them

• The Body
  Overall research project
  Your specific project

• The Conclusion
  Tell them what you told them and indicate next steps
Increase Your Understanding of the Research Area

- Read your advisor’s publications
- Talk with other group members
- Search the literature
Factors that Affect Your Effectiveness

- Your Credibility
  *(Take your introduction with you!)*
- Your Intellectual Honesty
- Your Delivery of the Talk
  *e.g. reading the visuals vs. talking*
Credibility Busters

- Mispronunciations
- Misspellings (especially of names)
- Lack of Understanding of the Basics
- Unfamiliarity with similar work
- Nervousness
How many mistakes can you find in the sentence below?

The affect of my determination to eliminate all mispronounciations and increase my credibility was that I insured that the relationship between John and I is more solid then the one between Heisenburg and Einstein.
Keys to Powerful Presentations

- Interesting work
- Knowledgeably and enthusiastically communicating it
- Engaging the audience with thought questions
- Communicating the implications of your work
The Role of Bloom’s Taxonomy in Preparing and Delivering Powerful Presentations!
The Role of Blooms Taxonomy

- Presents levels to shoot for
- Helps focus your preparation
- Helps you anticipate questions
- Allows you to prepare a higher level presentation
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Bloom’s Levels of Learning
Applied to Powerful Presentations

<table>
<thead>
<tr>
<th>Level</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Creating</td>
<td>Describe an experiment you could devise to test a new theory related to the work you have done</td>
</tr>
<tr>
<td>Evaluating</td>
<td>Judge whether the work of other researchers in the area will likely lead to good outcomes.</td>
</tr>
<tr>
<td>Analyzing</td>
<td>Compare your work to other work that has been done in the past. Why are you doing things differently?</td>
</tr>
<tr>
<td>Applying</td>
<td>Demonstrate the implications of your work in everyday life for the average person</td>
</tr>
<tr>
<td>Understanding</td>
<td>Explain the fundamental concepts behind the information you are presenting</td>
</tr>
<tr>
<td>Remembering</td>
<td>Recite all of the relevant concepts and ideas presented in your talk. Know definitions!</td>
</tr>
</tbody>
</table>
Create a Presentation Map

Title of Presentation

Main Topics

Subtopics

Secondary Subtopics
Stages of Preparation

- Acquisition of knowledge
  (understanding the information)
- Fluency
  (being able to discuss it in your own words)
- Assembling the talk
- Practice, practice, practice!!!
Tips for Practicing

Develop a schedule that will allow time for:

- Completing the draft at least one to two weeks before the talk
- Reciting the talk out loud to yourself
- Presenting it to your friends and colleagues
- Presenting it to your advisor
- Practicing it over and over!
The Role of *The Preparation Cycle* in Preparing and Delivering Powerful Presentations!
The Preparation Cycle

Develop & Review content.
Ask yourself questions about it, try to think of new angles and new ways to discuss it

“Present” the talk
Get feedback and refine it further

Review the completed presentation
Edit and refine it
The Bottom Line is that...

- An Extensive Knowledge Base
- Appropriate Visuals
- A Confident, Enthusiastic Performance

will ensure that you will present a powerful presentation that both you and your audience will thoroughly enjoy!
Writing Exercise

What behavior will you change or strategy will you implement for the next three weeks?
If you don’t start it within the next 48 hours...

... you probably never will.
Final Note

Please visit our website at www.cas.lsu.edu.
We have on-line workshops and information that will teach you more effective study strategies. I wish you a fantastically successful future!

Dr. Saundra McGuire
smcgui1@lsu.edu