Innovative Educators
Supporting Academic & Professional Growth In Higher Ed

Teach Students How to Learn 2.0: Strategies for Developing Critical Thinking Skills

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Please Use the Chat Box to Tell Us About Yourself

- *What is your primary position?*
  Learning Center faculty or staff, Faculty, Administrator, Counselor and/or Advisor, Other
- *What type of institution are you from?*
  Two Year, Four Year, Grad Degree Offering, Professional School, Other
- *How long have you been in your field?*
  0-2 years, 2-5 years, 5-10 years, 10-15 years, 15-20 years, Over 20 years
- *Have you ever attended a workshop or presentation presented by Saundra?*
  Yes, No, Don't Remember

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Saundra Y. McGuire

- Director Emerita, LSU Center for Academic Success
- Retired Assistant Vice Chancellor & Professor of Chemistry
- Elected Fellow of the Council of Learning Assistance and Developmental Education Associations (CLADEA), American Chemical Society (ACS), and American Association for the Advancement of Science (AAAS)
- NCLCA Learning Center Leadership Lifetime Certification (Level 4)
- Distinguished Teaching Award, College Reading and Learning Association (CRLA)
- Lifetime Mentor Award, American Association for the Advancement of Science (AAAS),
- Presidential Award for Excellence in Science, Mathematics, and Engineering Mentoring
- Inductee into LSU College of Science Hall of Distinction
- Author, *Teach Students How to Learn* and *Teach Yourself How to Learn*

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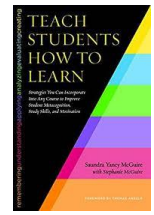
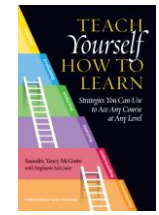


***McGuire, S.Y. & McGuire, S.N. (2015). Teach Students How to Learn: Strategies You Can Incorporate into Any Course to Improve Student Metacognition, Study Skills, and Motivation*. Sterling, VA: Stylus**



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Desired outcomes

- We will be able to **describe at least three concrete metacognitive learning strategies** that we can teach to increase critical thinking
- We will be able to **explain the barriers to getting students to use metacognitive learning strategies**
- We will be able to **discuss the role that mindset plays** in getting students to be metacognitive in their thinking
- We will be able to **compare the relative roles of metacognition and mindset** in improving students' critical thinking skills and subsequent success

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Working Definitions Critical Thinking

"Critical thinking is the intellectually disciplined process of actively and skillfully conceptualizing, applying, analyzing, synthesizing, and/or evaluating information gathered from, or generated by, observation, experience, reflection, reasoning, or communication, as a guide to belief and action." --
Michael Scriven and Richard Paul
www.criticalthinking.org/pages/defining-critical-thinking/766

Critical thinking is, in short, self-directed, self-disciplined, self-monitored, and self-corrective thinking.
Richard Paul and Linda Elder
www.criticalthinking.org/files/Concepts_Tools.pdf

Critical thinking is the ability to "question every possibility"
Broward College Students
www.broward.edu/sacs/qep/Documents/Broward_College_QEP_Proposal_SACSCOC.pdf

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Metacognition

The ability to:

- think about your own thinking
- be consciously aware of yourself as a problem solver
- monitor, plan, and control your mental processing (e.g. "Am I *understanding* this material, or just *memorizing* it?")
- accurately judge your level of learning
- know what you know and what you don't know

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Reflection Questions

- What, if any, metacognitive strategies have you incorporated into your classes or tried to teach students?
- On a scale of 1 – 5, how satisfied were you with the results? (1 = not at all; 5 = extremely pleased)

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Key Components in the Intervention

- **Early first test or quiz with learning strategies discussion only after students have their grades**
- **Before and after scores of students who have used the intervention**
- **Conducting the discussion on metacognition, Bloom's and the Study Cycle using reflection questions rather than telling information**
- **Demonstrable belief that students CAN go from an F to A**
- **Challenge to the class with incentive if class meets challenge**

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Secret Ingredients of the Metacognition Presentation

- ***Be very specific*; don't assume students know any of the basics (e.g. the importance of the textbook)**
- ***Fervently believe* and communicate that belief**
- ***Take the pressure off* the students; blame the brain's irresponsible behavior, not the students**
- ***Relate* to the students' struggles by communicating you own struggles**
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- ***Use accessible, inclusive language; us, not you***
- ***Make the sale;* show them what WILL happen if they use the strategies, and make them believe it!**

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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?

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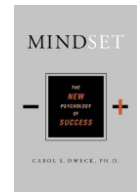
Help Students Develop the Right Mindset



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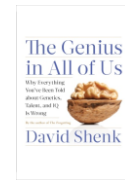

Shenk, David, 2010. ***The Genius in All of Us: Why Everything You've Been Told About Genetics, Talent, and IQ Is Wrong. New York: Doubleday***

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*Mindset** is Important!

- **Fixed Intelligence Mindset**
  Intelligence is static
  You have a certain amount of it
- **Growth Intelligence Mindset**
  Intelligence can be developed
  You can grow it with actions

Dweck, Carol (2006) *Mindset: The New Psychology of Success.* New York: Random House Publishing

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Responses to *Many* Situations are Based on Mindset

	Fixed Intelligence Mindset Response	Growth Intelligence Mindset Response
Challenges	*Avoid*	*Embrace*
Obstacles	*Give up easily*	*Persist*
Tasks requiring effort	*Fruitless to Try*	*Path to mastery*
Criticism	*Ignore it*	*Learn from it*
Success of Others	*Threatening*	*Inspirational*

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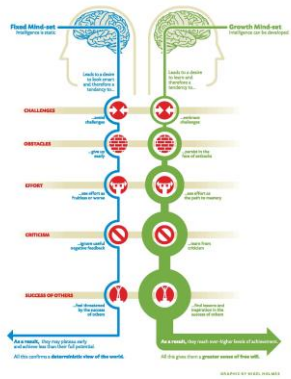

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Which mindset about intelligence do you think *most students* have?

1. Fixed
2. Growth

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Which mindset about *student* intelligence do you think *most faculty* have?

1. Fixed
2. Growth

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Which mindset about *student* intelligence do you think *most STEM faculty* have?

1. Fixed
2. Growth

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INSIDE HIGHER ED

Published on *Inside Higher Ed* (https://www.insidehighered.com)

Home > Study links faculty attitudes on intelligence to student success in STEM, with large impact on minority student success

Study links faculty attitudes on intelligence to student success in STEM, with large impact on minority student success

Submitted by Scott Jaschik on February 18, 2019 - 3:00am

A new study suggests that faculty members' attitudes about intelligence can have a major impact on the success of students in science, mathematics and technology courses. Students see more achievement when their instructors believe in a "growth mind-set" about intelligence than they do learning from those who believe intelligence is fixed. The impact was found across all student groups but was most pronounced among minority students.

The study -- by brain science scholars at Indiana University at Bloomington -- was published in the journal *Science Advances* and presented last week at the annual meeting of the American Association for the Advancement of Science.

The researchers collected data on 150 faculty members in a range of STEM disciplines and 15,000 students over two years at a large public research university that is not identified. Faculty members were asked to respond to a general statement about intelligence along the lines of "To be honest, students have a certain amount of intelligence, and they really can't do much to change it."

The study then looked at student performance in courses taught by those who agreed with that perspective and those who did not.

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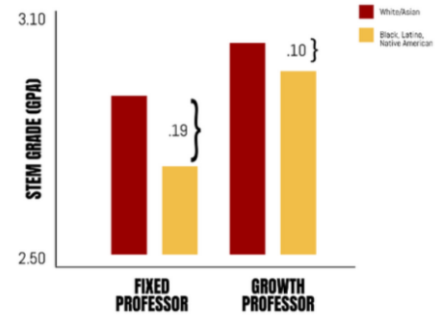
The findings:

While all students perform better when STEM professors endorse a growth mindset belief, the racial achievement gap is almost halved when professors endorse a growth-mindset belief.



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Email from a Gen Chem Student

"…Personally, **I am not so good at chemistry** and unfortunately, at this point my grade for that class is reflecting exactly that. I am emailing you **inquiring about a possibility of you tutoring me."** April 6, 2011

"I made a 68, 50, (50), 87, 87, and a 97 on my final. I **ended up earning a 90 (A) in the course**, **but I started with a 60 (D)**. I think what I did different was make sidenotes in each chapter and as I progressed onto the next chapter I was able to refer to these notes. ***I would say that in chemistry everything builds from the previous topic.*** May 13, 2011

Semester GPA: 3.8

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American, Japanese, and Taiwanese Mothers' View of Mathematics Achievement*

- American mothers rated **effort as significantly less important** than Asian mothers
- American mothers **rated ability as significantly more important** than Asian mothers
- American mothers said it was **possible to predict a child's high school math performance much earlier** than Asian mothers said was possible
- American **parents are satisfied with their children's mediocre performance**, whereas Asian parents express much less satisfaction with their children's higher achievement.
- American parents and children **believe that Asian children are more talented in mathematics** than American children.

*Uttal, D. H. (1997). Beliefs about genetic influences on mathematics achievement: A cross-cultural comparison. *Genetica*, *99*, 165–172.

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Lubbock Christian University Faculty Obstacles, Barriers, Failures

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How Lubbock Christian University Faculty Overcame Struggles

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Email from Lubbock Christian University Professor about Impact of Faculty Sharing Their Struggles and How They Overcame Them

March 2, 2018

I wish I could put into words **the impact that it had on students**. We received emails, texts, comments from students that some of them were in tears, some said it was the **most meaningful chapel we'd shared**. They **loved to see that we are all human** and that the **road to success is a winding one.**

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Sharing Before and After Scores Can Be *Very* Motivational

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Before and After

- Robert, freshman chemistry student
  42, 100, 100, 100 A in course
- Michael, senior pre-med organic student
  30, 28, 80, 91 B in course
- Miriam, freshman calculus student
  37.5, 83, 93 B in course
- Ifeanyi, sophomore thermodynamics student
  67, 54, 68, 95 B in course
- Terrence, junior Bio Engineering student
  GPA 1.67 cum, 3.54 (F 03), 3.8 (S 04)

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Activity

Develop three ways that you can incorporate metacognition into your class or in consultations with students

Share these with a colleague.

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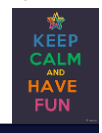
Conclusion

- There are no right or wrong approaches; experiment and see what works!
- No two students or classes are exactly alike; what works for one may not work for another
- When you believe in students and successfully communicate that belief, they will respond
- You CAN have fun teaching students HOW to learn!



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Acknowledgements

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- National College Learning Center Association (NCLCA)
- College Reading and Learning Association (CRLA)
- Colleagues at LSU, especially the Center for Academic Success and the Department of Chemistry
- www.lsche.net
- https://lists.ufl.edu/archives/lrnasst-l.html
- Sarah Baird, former CAS learning strategist
- Stephanie McGuire, co-author of TSHTL and TYHTL
- The many students who have proven to us that metacognitive strategies really do work!

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