Series on developing your metacognitive skills

#1: Thinking about your thinking: Developing metacognitive skills to improve your chances for success in grad school

#2: The importance of stupidity in scientific research: Learning from your mistakes and obstacles in your development as a scientist

#3: Working with people who are different than you: Using the Myers-Briggs Types can help effective communication

Key Messages from Part 1:

- The journey to your PhD requires that you discover your starting point.
- Discovering your starting point is not trivial, but is possible.
- You need to adapt your skills to the new context of grad school at Northwestern.

A concrete application:
How would you approach this statement?

Describe your career goals and any educational or personal experiences relevant to your goals, objectives, and research plan. Focus on qualities and experiences that make success in graduate school and beyond more likely, such as creativity, independence, motivation, perseverance, communication, and leadership skills. If applicable, document your ability to face or overcome difficulties. Account for gaps in your education and employment. Include other significant accomplishments and background information not mentioned elsewhere in the application.

The importance of stupidity in scientific research: Learning from your mistakes and obstacles in your development as a scientist

CLIMB
Collaborative Learning and Integrated Mentoring in the Biosciences

Steve Lee, PhD
CLIMB Program
Assistant Director
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A poser is someone who pretends to be someone else, in order to fit into a social group.

Do you sometimes feel like a poser scientist?
Key Message #1:
There is no point at which we magically transform from being a poser scientist to a real scientist.

As researchers, we are always at the frontiers of knowledge, so we’re always grappling with concepts that we don’t fully understand.

Let’s consider some literature and other ideas…

"The importance of stupidity in scientific research"

Scientific research means exploring at the frontiers of our understanding, and so it’s important to get used to not understanding everything.

"Doctoring Uncertainty: Mastering Craft Knowledge”

- many new grad students face the harsh reality of the difficulties in getting their experiments to work
- as undergrads, they had been accustomed to lab experiments or smaller projects that had a high chance of success
- when we publish or present our research, we often remove or marginalize mentioning our failures

TED Talk: Trial and Error and the God Complex
by Tim Harford

- Harford notes that when we have a god-complex, we think we can understand and solve everything as experts.
- But real research problems can’t be solved with token solutions.
- He proposes that we learn to make smart mistakes and to solve problems by trial and error.

Key Message #2:

- If we can acknowledge that we need to grow and develop in new areas, we can accept that we will make mistakes.
- Thus we need to figure out how to learn from our mistakes and improve.
- This can be applied in our science and professionally.

Fixed vs Growth Mindsets
Carol Dweck

How might this framework help you to think about challenges?
your effort?
receiving criticism?
success of others?
Before we move into a self-reflection exercise, here are two personal stories of failures and lessons that I learned:

- 1st semester of grad school
- going up for tenure

Self-reflection exercise:
Reflect and write about one of these topics:
• a past experience in which you failed miserably
• when you got very angry or fearful
• a working relationship which you hated
• what are you anxious or fearful about in your future?
• anything else that’s on your mind
• Describe your career goals and any educational or personal experiences relevant to your goals, objectives, and Research Plan. Focus on qualities and experiences that make success in graduate school and beyond more likely, such as creativity, independence, motivation, perseverance, communication, and leadership skills. If applicable, document your ability to face or overcome difficulties. Account for gaps in your education and employment. Include other significant accomplishments and background information not mentioned elsewhere in the application.

After writing, pair up and share:
Discuss with your partner(s):
• which topic did you write about?
• what do you think about some of the literature and ideas that was presented today?
• are you generally aware of your mistakes and weaknesses?
• how do you respond to criticism? do you pro-actively seek feedback?
• do you have someone whom you can trust to honestly point our your weaknesses and help you to improve?

Key Messages:
○ As researchers, we are always at the frontiers of knowledge, so we’re often grappling with concepts that we don’t fully understand.
○ We need to abandon the god-complex, accept that we will make mistakes, and figure out how we’ll learn from our mistakes, if we are to grow in new areas.

Resources
○ Chip and Dan Heath's “Switch”
○ Daniel Goleman’s “Emotional Intelligence” and “Working with Emotional Intelligence”
○ Carol Dweck’s “Mindset”
○ Marshall Goldsmith’s “What Got You Here, Won’t Get You There”

For the next CLIMB workshop:
• The Myers-Briggs test is posted in BB and will be emailed to you.
• Take the test and and email your results back to me before next week.