



# CRITICAL THINKING

Spring 2021 CETL Workshop

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# The big picture

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## 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.” (<https://www.criticalthinking.org/pages/defining-critical-thinking/766>)

## Critical Reflection is...

“the active, persistent and careful consideration of any belief or supposed form of knowledge in the light of the grounds that support it, and the further conclusions to which it tends”.  
Dewey, J. (1910). *How we think*.

*The challenge is NOT to get students to simply accept what we say (we should and will talk about expertise, intellectual and academic authority, and questioned knowledge and authority), but to question their thoughts, assumptions, and conclusions in light of evidence, no matter how unsettling. This entails identifying and overcoming ignorance and occasionally arrogance.*

**The question is:** How do we get students to accept this? What kind of assignments work?



# What's the problem?

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*And what are some strategies to overcome them?*

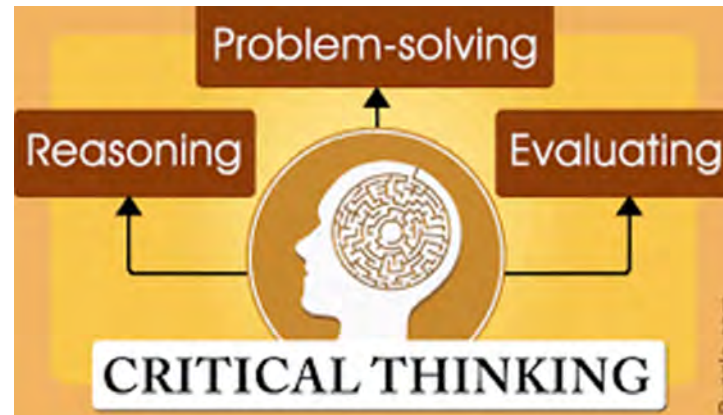


# Complete this sentence:

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- *I want/need my students to \_\_\_\_\_, but they \_\_\_\_\_.*
- What are the tell-tale signs of uncritical thinking?
- What are the consequences of it?

# Frameworks



- Ultimately, we want our students to think and reason with an open mind and a modicum of intellectual humility. We want them to draw conclusions based on logic, reason, and evidence, not mere opinion. *We want them to learn.*

Critical thinking requires some work from us as well as our students. What can we do at each stage?

### **Steps/stages**

1. Content exposure/phenomena observation
2. Consider possibilities
3. Challenge assumptions
4. Suspend judgment
5. Data over beliefs
6. Retest ideas
7. Defend conclusions
8. Revise conclusions?

### **Strategies**

1. How?
2. How?
3. How?
4. How?
5. How?
6. How?
7. How?
8. How?

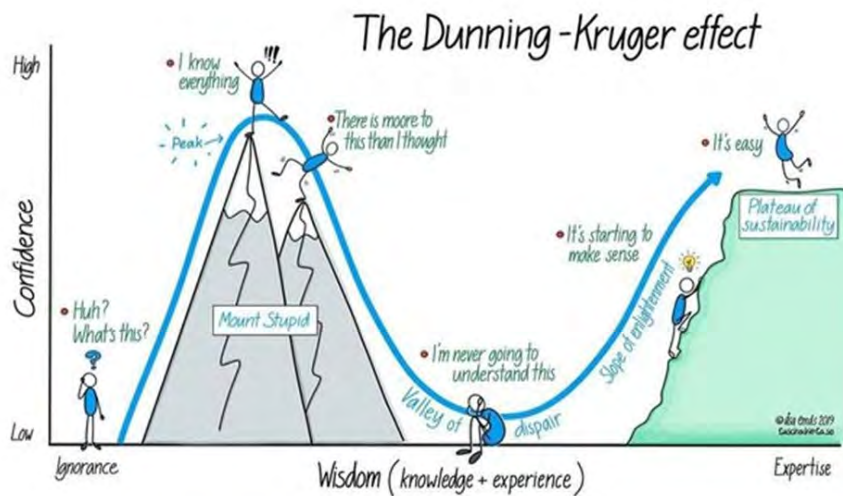




# Additional Challenges...

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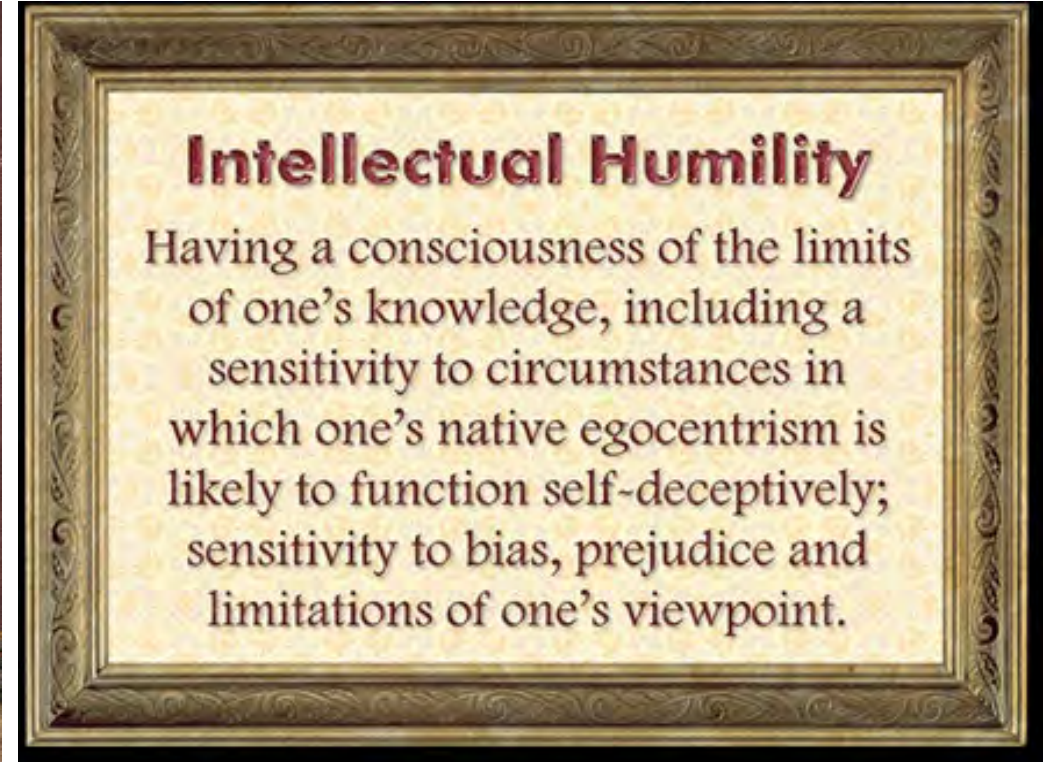
*...and solutions*



<https://www.zmescience.com/science/the-dunning-kruger-effect-feature/>



Why Facts Don't Change Our Minds



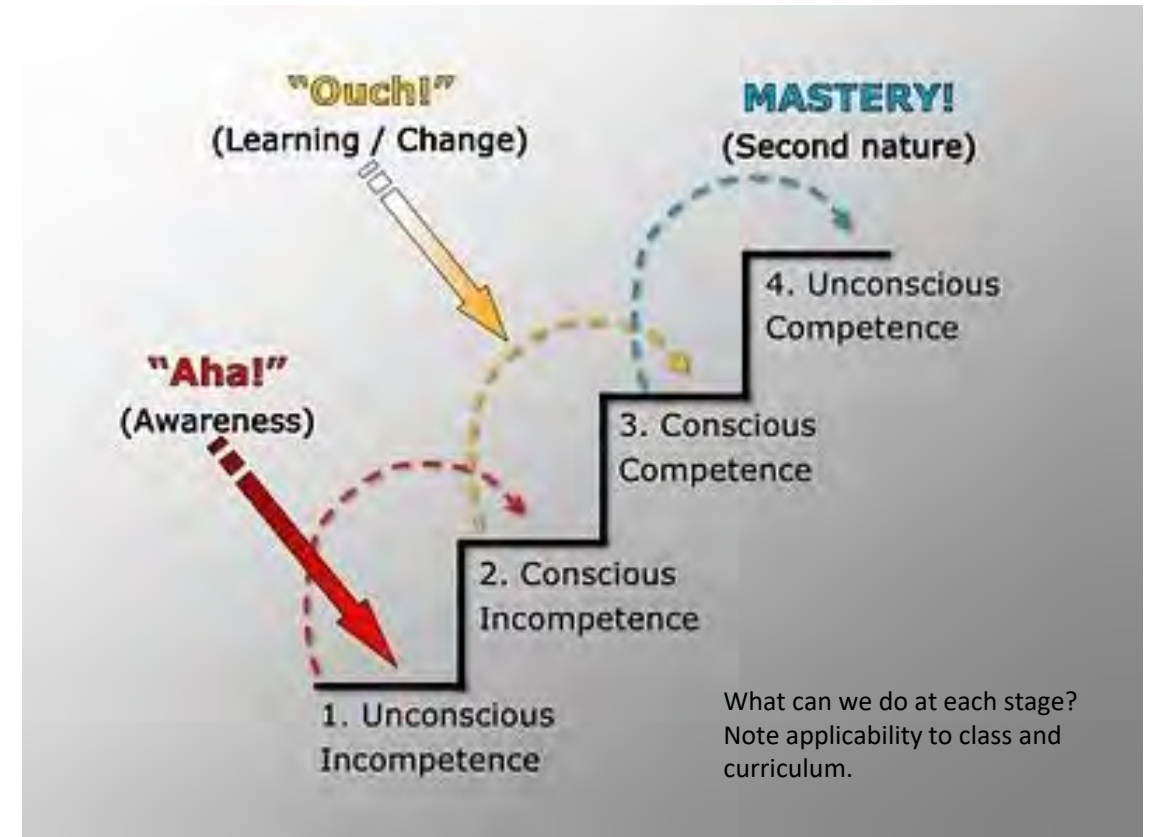
Intellectual humility: the importance of knowing you might be wrong

[Why it's so hard to see our own ignorance, and what to do about it.](#)



# Incompetency → Competency

How do we guide the steps?



# Ophelia & Meno



- Act 1, Scene 3, *Hamlet*.
  - *Ophelia*: “I do not know, my lord, what I should think.”
  - *Polonius*: “I’ll teach you. Think yourself a baby...”
  - Problem: Teacher gives answers, not questions; does not allow or encourage independent thinking.
  - Things do not end well for Ophelia.
  - Don’t be a Polonius.
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- Plato’s *Meno*.
  - Context: An uneducated person can, with proper guidance/challenge, solve difficult problems.
  - Teachers don’t give answers; students discover them. This requires effort.
  - Teachers are facilitators.
  - Students must set a lot aside and become curious empiricists.

# What do we need to succeed?

- Good questions
- Good examples
- Good experiences/assignments
- Good feedback
  - Timely indicators of success and failure, insight and oversight

Jowett, Dialogues of Plato, Vol. II, Macmillan, third ed., 1892

## *Socrates and the boy.*

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*Soc.* Let us describe such a figure: Would you not say *Meno.* that this is the figure of eight feet?

*Boy.* Yes.

*Soc.* And are there not these four divisions in the figure, each of which is equal to the figure of four feet?

*Boy.* True.

*Soc.* And is not that four times four?

*Boy.* Certainly.

*Soc.* And four times is-not double?

*Boy.* No, indeed.

*Soc.* But how much?

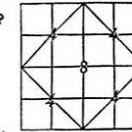
*Boy.* Four times as much.

*Soc.* Therefore the double line, boy, has given a space, not twice, but four times as much.

*Boy.* True.

*Soc.* Four times four are sixteen — are they not?

*Boy.* Yes.



*Meno.*  
*SOCRATES,*  
*MENO'S*  
*SLAVE.*



# The Ultimate Cheatsheet for Critical Thinking

Want to exercise critical thinking skills? Ask these questions whenever you discover or discuss new information. These are broad and versatile questions that have limitless applications!



<b>Who</b>	<ul style="list-style-type: none"> <li>... benefits from this?</li> <li>... is this harmful to?</li> <li>... makes decisions about this?</li> <li>... is most directly affected?</li> </ul>	<ul style="list-style-type: none"> <li>... have you also heard discuss this?</li> <li>... would be the best person to consult?</li> <li>... will be the key people in this?</li> <li>... deserves recognition for this?</li> </ul>
<b>What</b>	<ul style="list-style-type: none"> <li>... are the strengths/weaknesses?</li> <li>... is another perspective?</li> <li>... is another alternative?</li> <li>... would be a counter-argument?</li> </ul>	<ul style="list-style-type: none"> <li>... is the best/worst case scenario?</li> <li>... is most/least important?</li> <li>... can we do to make a positive change?</li> <li>... is getting in the way of our action?</li> </ul>
<b>Where</b>	<ul style="list-style-type: none"> <li>... would we see this in the real world?</li> <li>... are there similar concepts/situations?</li> <li>... is there the most need for this?</li> <li>... in the world would this be a problem?</li> </ul>	<ul style="list-style-type: none"> <li>... can we get more information?</li> <li>... do we go for help with this?</li> <li>... will this idea take us?</li> <li>... are the areas for improvement?</li> </ul>
<b>When</b>	<ul style="list-style-type: none"> <li>... is this acceptable/unacceptable?</li> <li>... would this benefit our society?</li> <li>... would this cause a problem?</li> <li>... is the best time to take action?</li> </ul>	<ul style="list-style-type: none"> <li>... will we know we've succeeded?</li> <li>... has this played a part in our history?</li> <li>... can we expect this to change?</li> <li>... should we ask for help with this?</li> </ul>
<b>Why</b>	<ul style="list-style-type: none"> <li>... is this a problem/challenge?</li> <li>... is it relevant to me/others?</li> <li>... is this the best/worst scenario?</li> <li>... are people influenced by this?</li> </ul>	<ul style="list-style-type: none"> <li>... should people know about this?</li> <li>... has it been this way for so long?</li> <li>... have we allowed this to happen?</li> <li>... is there a need for this today?</li> </ul>
<b>How</b>	<ul style="list-style-type: none"> <li>... is this similar to _____?</li> <li>... does this disrupt things?</li> <li>... do we know the truth about this?</li> <li>... will we approach this safely?</li> </ul>	<ul style="list-style-type: none"> <li>... does this benefit us/others?</li> <li>... does this harm us/others?</li> <li>... do we see this in the future?</li> <li>... can we change this for our good?</li> </ul>

## DEALing with critical thinking

Incorporate aspects of the **DEAL** model into your assignments:

- **D**escribe an experience
- **E**xamine it through the lens of academic concepts or strategies
- **A**rticulate **L**earning by explaining what was learned, how, when, and why it matters.

*Give students space to discuss how, when, and why their assumptions were either validated or challenged and what they did about it.*

# Strategies

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Discussions

Debates

Simulations

Case-based  
learning

Problem-  
based learning

Reading,  
writing,  
research

Experiments

Experiential  
learning

Journals

Peer review

Cognitive (and  
affective?)  
wrappers?

What else?

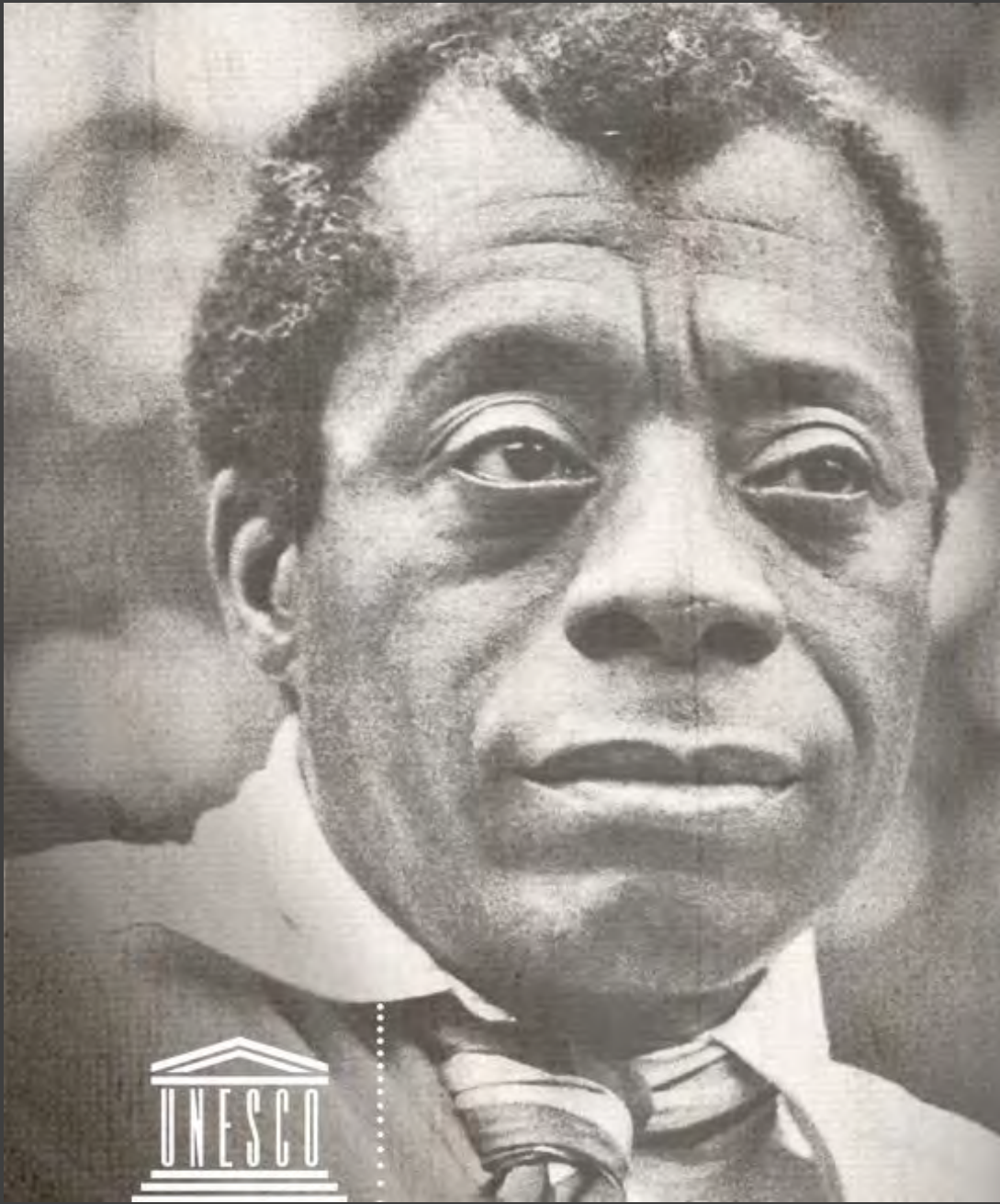
# Additional Resources

- On how to disagree: <https://www.nytimes.com/2017/09/24/opinion/dying-art-of-disagreement.html?mcubz=3>
- On how to argue constructively: <https://www.theatlantic.com/.../erisology-the.../586534/>
- On creativity: [https://www.podbean.com/media/share/pb-rq73v-e26fab?utm\\_campaign=au\\_share\\_ep&utm\\_medium=dlink&utm\\_source=au\\_share](https://www.podbean.com/media/share/pb-rq73v-e26fab?utm_campaign=au_share_ep&utm_medium=dlink&utm_source=au_share) and <https://qz.com/quartz/1381916/drawing-is-the-best-way-to-learn-even-if-youre-no-leonardo-da-vinci/?fbclid=IwAR2YOYJh3UilbqZ2q3i2pXo5ZPw1B1N6oBQJ8BVTks9dySJDl6Rq40yJmP0>
- On intellectual humility: <https://www.vox.com/science-and-health/2019/1/4/17989224/intellectual-humility-explained-psychology-replication?fbclid=IwAR04E0yPnR3gGcmgOVtM7hB800M9cdeS2cFYn52TdhQtaFkxvnFTWpWFQwU>
- On why facts don't change our minds: [https://www.newyorker.com/magazine/2017/02/27/why-facts-dont-change-our-minds?utm\\_social-type=owned&mbid=social\\_facebook&utm\\_brand=tny&utm\\_source=facebook&utm\\_medium=social&fbclid=IwAR2\\_iH9WGpKHVrLPz4VbwYaqPQi\\_bIEV3GyPtKlyKJCzZ1aZN1kD8lcc9Nk](https://www.newyorker.com/magazine/2017/02/27/why-facts-dont-change-our-minds?utm_social-type=owned&mbid=social_facebook&utm_brand=tny&utm_source=facebook&utm_medium=social&fbclid=IwAR2_iH9WGpKHVrLPz4VbwYaqPQi_bIEV3GyPtKlyKJCzZ1aZN1kD8lcc9Nk)
- On teaching students how to learn: <https://www.insidehighered.com/advice/2019/02/19/advice-faculty-members-how-teach-students-how-learn-opinion#.YFomcVOQ3a8.link>

*"Read everything, think hard, write a lot". Think critically as a habit. Debate everything!*



Helpful Tips!



“ It is certain, in any case, that **ignorance**, allied with **power**, is the most ferocious enemy **justice** can have ”

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James Baldwin

2/8/1924 - 1/12/1987

