

# Enhancing Critical Reflection in General Education

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Powerpoint available from <http://talks.joelau.info>

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# Many motivations for general education

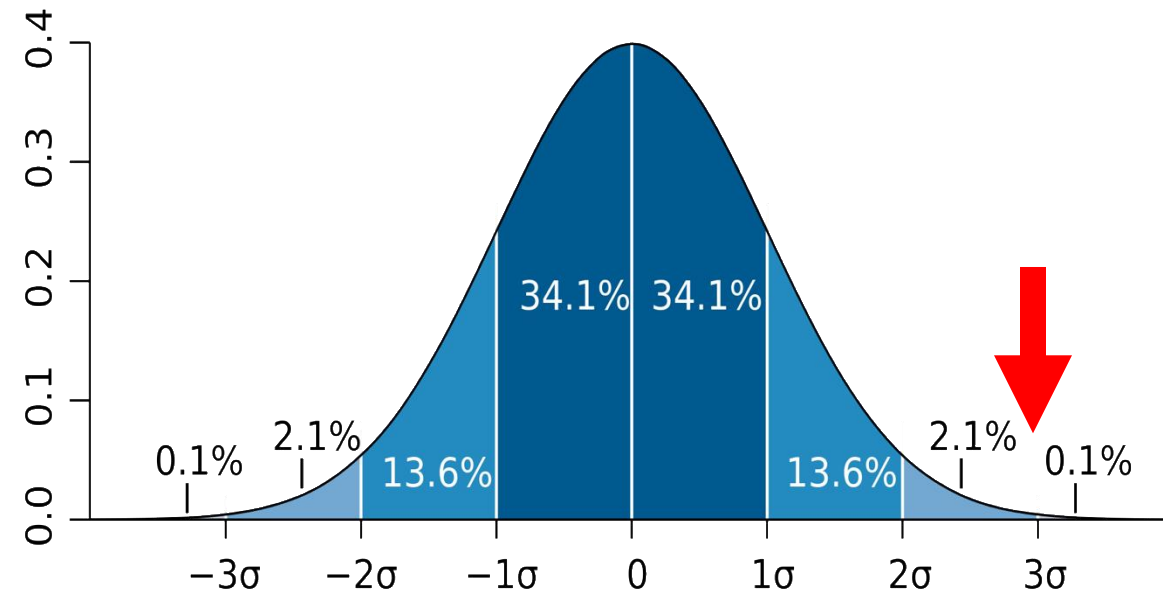
- Appreciation of cultural heritage
- Avoid over-specialization
- Preparing for global society
- Training for the modern workplace ...

# Critical thinking

- **Thinking clearly and rationally about what to believe or do.**
  - Independent and reflective thinking
  - Analysis of arguments, logical connections between ideas
  - Scientific reasoning ...
- 99% college faculty: developing critical thinking “very important”, “essential” goal of undergraduate education.  
(Higher Education Research Institute, 2009)
- But how to improve critical thinking?

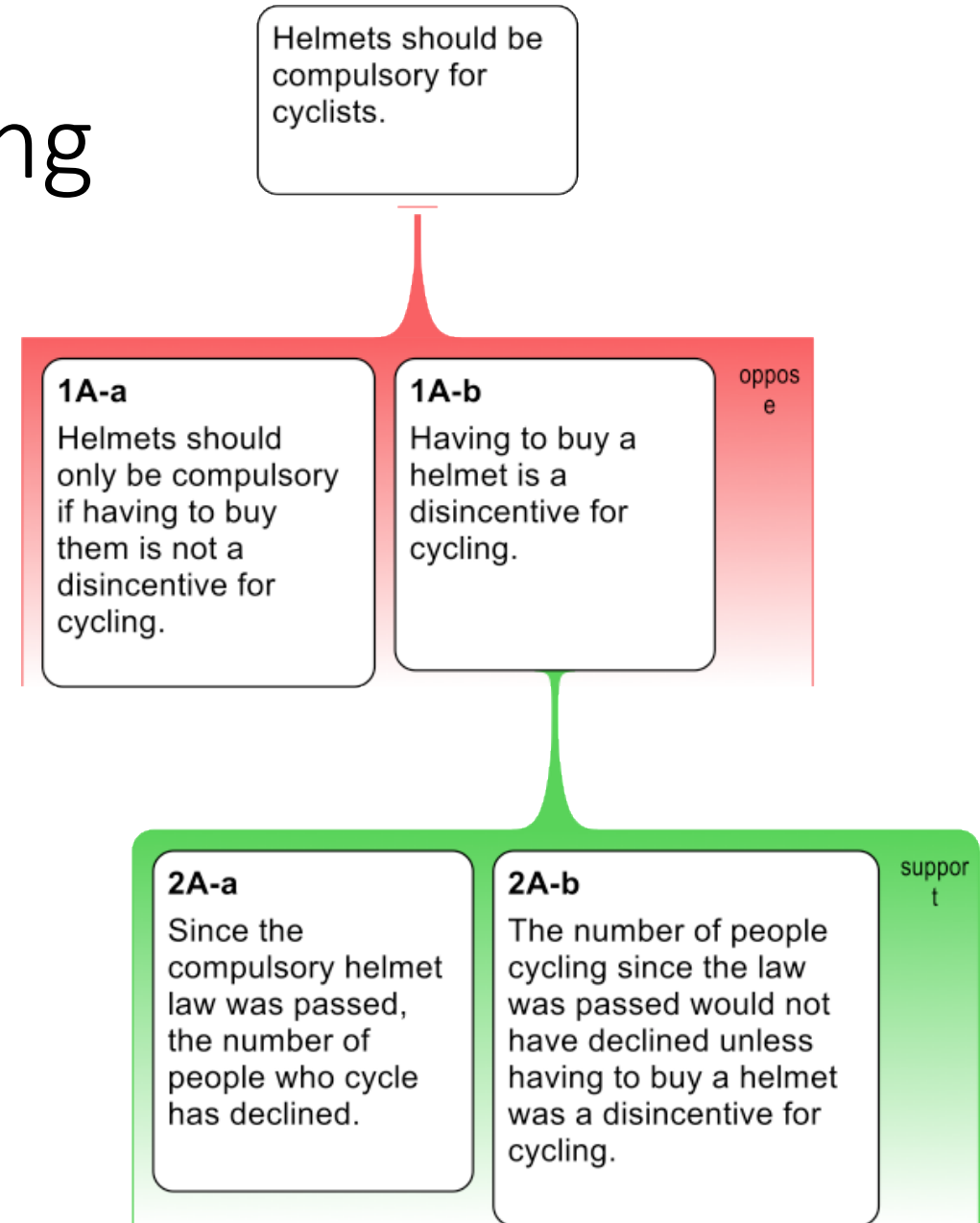
# Modest effects in improving critical thinking

- Niu et al. (2013) critical thinking courses result in 0.20 SD increase in critical thinking test score.
- Arum and Roksa (2011) 0.18 SD increase over first three semesters of undergraduate education. 0.47 SD over 4 years.
- Huber and Kuncel (2015) 0.59 SD over 4 years.
- 0.50 SD gain will move someone from the 50<sup>th</sup> percentile to the 69<sup>th</sup>.
- What about Hong Kong?



# Examples of effective learning

- van Gelder (2015)  
One-semester critical thinking courses  
using argument maps: 0.7
- Hake (1998) (N=6542)  
Introductory physics / mechanics course  
Traditional lectures: 0.23  
Interactive engagement: 0.48



# Interactive teaching more effective

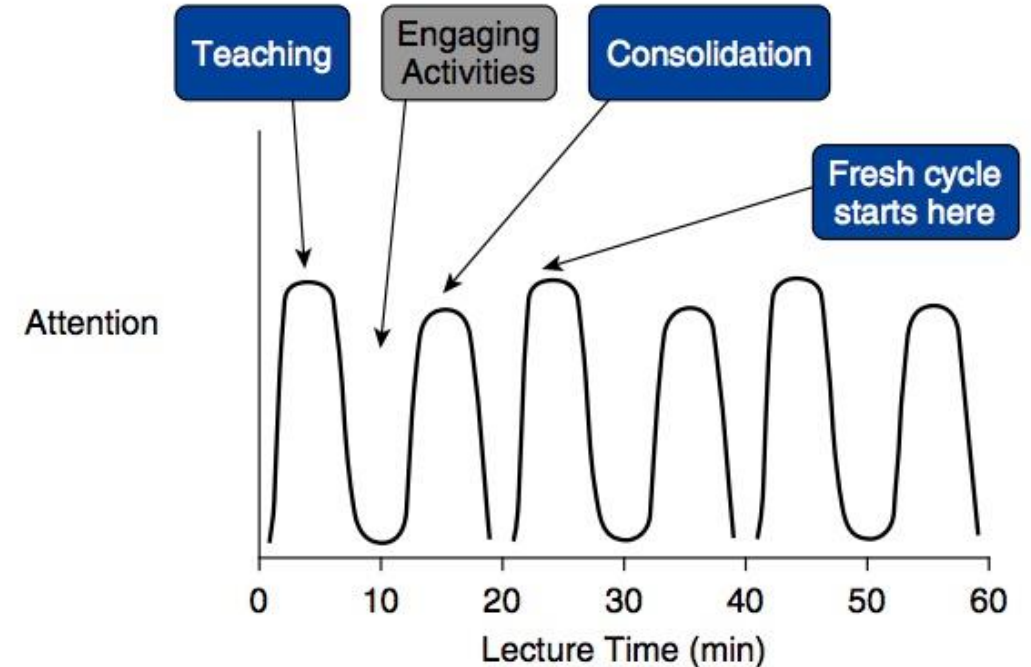
- Don't automatically assume that teaching is effective.
- Any reliable objective measures available?
- Traditional passive lectures not always effective.
  - Attention, retention, lack of feedback ...
  - Particularly relevant for GE?
- More effective forms of learning
  - Frequent, active, structured learning activities
  - Test for common misunderstanding
  - Responsive feedback

# Reality

- “Not my course”
- Alternatives are time-consuming, labour intensive, and expensive.
- Design of tutorials.
- Institutional and community support.
- Lectures are here to stay (for a while).

# Teaching strategies worth trying

- Highlight importance and important points.
- Make connections with previous knowledge.
- Check for understanding: Q&A, polling
- ...





# Quiz

- Namibia is a country in Africa.
- Try to guess its population. Above or below 100 million?
- Come up with an estimate: \_\_\_\_\_

# Pedagogy of surprise

- Novelty that is conducive to learning.
- Fun, attention, memory retention, interest
- Promotes critical reflection
- Techniques: Inconsistency, surprising statistics, predictions ...

# Critical reflection

- Critical thinking can co-exist with cognitive biases.
- Good teaching too!
- Unconscious psychological and cultural influences on cognition.
- A special task for general education:  
Promote metacognitive reflection on our thinking and values.