Week 6 Video 2

Visualization

Moment-By-Moment Learning Graphs
First...

- I’d like to start with an observation about learning curves
They shouldn’t be called learning curves
They should be called performance curves
They should be called performance curves

- Because they show the relationship between performance and time
- You can infer learning from them...
- But they aren’t curves of learning
This was fine for decades...

- Until folks actually wanted to graph learning over time

- Then it became really annoying
Moment-By-Moment Learning Graphs (MBMLG)

- (True learning curves, but we can’t call them that)
Based on the Moment-By-Moment Learning Model


- Discussed in mathematical detail in week 4
Moment-By-Moment Learning Model

- Gives us moment-by-moment assessments of learning
Can be used to create a Moment-by-Moment Learning Curve

- X axis: Opportunity to practice skill
- Y axis: Moment-by-Moment learning assessments
Moment-by-moment learning curves

- Are meaningful to interpret for individual students

- Much harder to do this with traditional learning curves
  - Accuracy = 0 or 1
  - Time is noisy
Let’s look at a few graphs
What might this MBMLG mean?
Insert Pause-Continue Quiz Here
Steady learning
What might this MBMLG mean?
Insert Pause-Continue Quiz Here
A Eureka moment
What would that model correspond to

- In a traditional learning curve?
What would that model correspond to in a traditional learning curve?
A Eureka Moment
What might this graph mean?
Insert Pause-Continue Quiz Here
Corresponds to learning curve
What might this graph mean?
Multiple skills treated as a single skill
Corresponds to (several)
What might this graph mean?
Insert Pause-Continue Quiz Here
It’s still a mystery to me…
(post your ideas on the forums!)
(It turns out to be quite common)
Uses

- To study relationships between learning trajectories and learning outcomes

Table 4 – The correlation between a student’s proportion of a specific visual form of the moment-by-moment learning curve across skills, and their performance on the four learning tests. Statistically significant findings (controlling for false discovery rate) are highlighted in dark gray; marginally significant findings are highlighted in light gray.

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<th>Curve form</th>
<th>Test</th>
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<th>F</th>
<th>p</th>
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Uses

- To analyze individual students’ learning
Uses

- To study which learning material most promotes learning

Next lecture

- Heat Maps, Scatterplots, and Parameter Space Maps