GIFT EXCHANGE

Powerful Teaching Tools for Remote and In-Person Learning

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MECHANICAL & AEROSPACE ENGINEERING

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University of Colorado
Boulder | Colorado Springs | Denver | Anschutz Medical Campus

FREE STUFF!!

Each registrant will be automatically entered to win a $20 eGift Card from Amazon. No purchase necessary but must be present during the announcement at the end of our talk.

MORE FREE STUFF!!

Attend the most 2021 Spring GIFT Exchange sessions and be eligible to win a $50 eGift Card from Amazon. Winner will be announced at the April 6 GIFT Exchange.
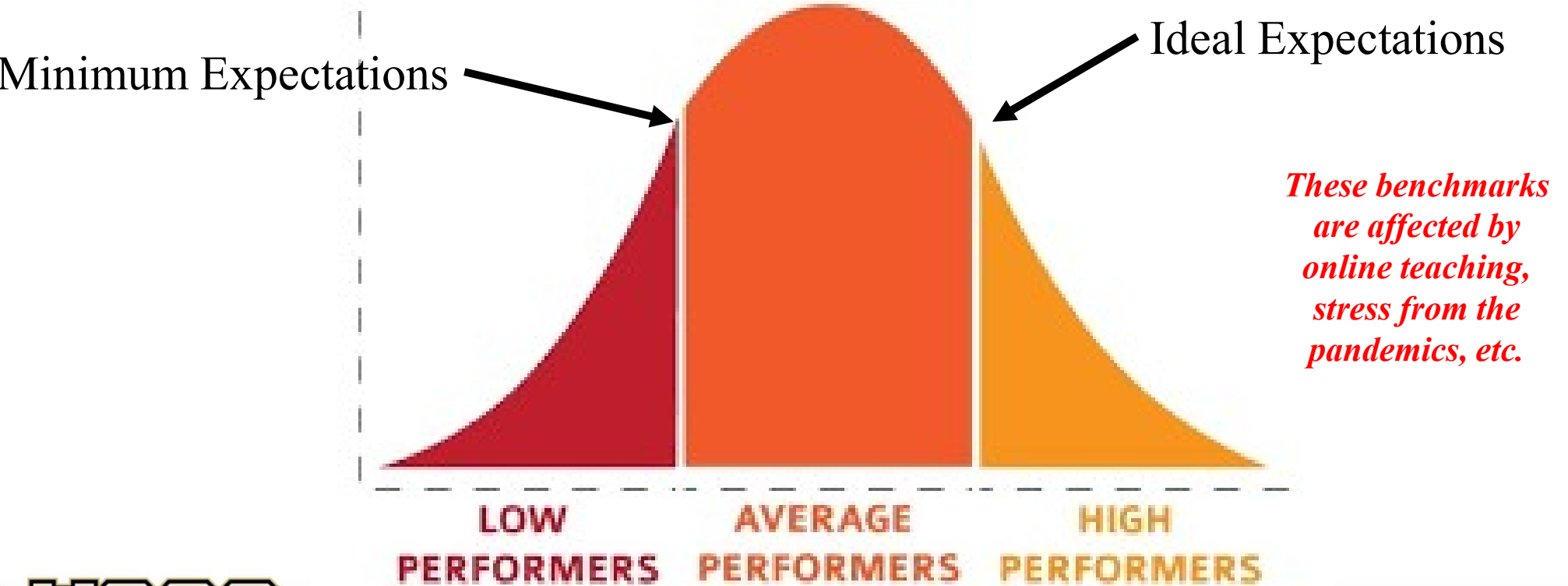
Purpose

- Preliminary presentation- gather your thoughts/comments on these strategies.

- For me- complete picture of the problem

- Strategies to specifically address quality control in response to the pandemic and distance learning.

- Your comments are extremely valuable so that I can collect data effectively and completely
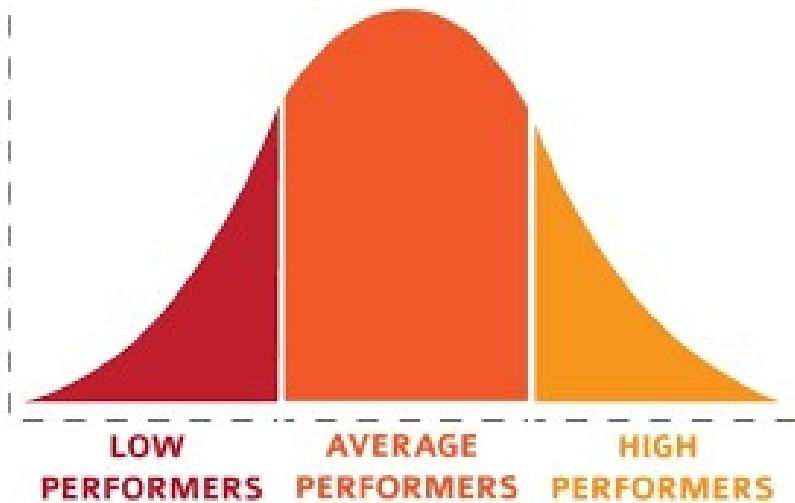
Motivation

- Improve program retention and recruitment during the pandemic and beyond.

- Better prepare students to enter the workforce, graduate studies, etc.

- Identify teaching practices that are time expensive/ineffective to relieve faculty.

- Need to identify the ideal product (student).

Performance Metrics?

Minimum Expectations

Ideal Expectations

These benchmarks are affected by online teaching, stress from the pandemics, etc.

LOW PERFORMERS   AVERAGE PERFORMERS   HIGH PERFORMERS

Performance Metrics?

LOW PERFORMERS AVERAGE PERFORMERS HIGH PERFORMERS

High Performer Traits (mentioned by faculty)
- Self-sufficient
- Identifies weaknesses early and acts on them
- Sends specific questions
- Organized
- Good communicators
- More?

Performance Metrics?

LOW PERFORMERS   AVERAGE PERFORMERS   HIGH PERFORMERS

Low Performer Traits (mentioned by faculty)
- Fails to submit assignments
- Skip lectures
- Unorganized both in submission clarity and late work
- Does not reach out for help
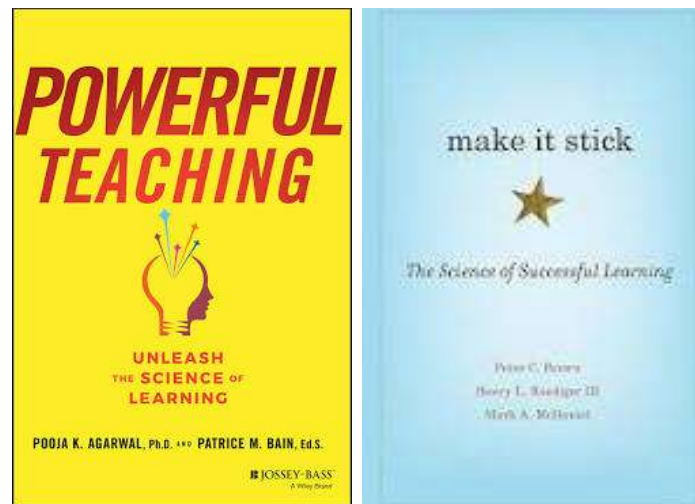- Eventually drops or stops participation
- More?

Performance Metrics?
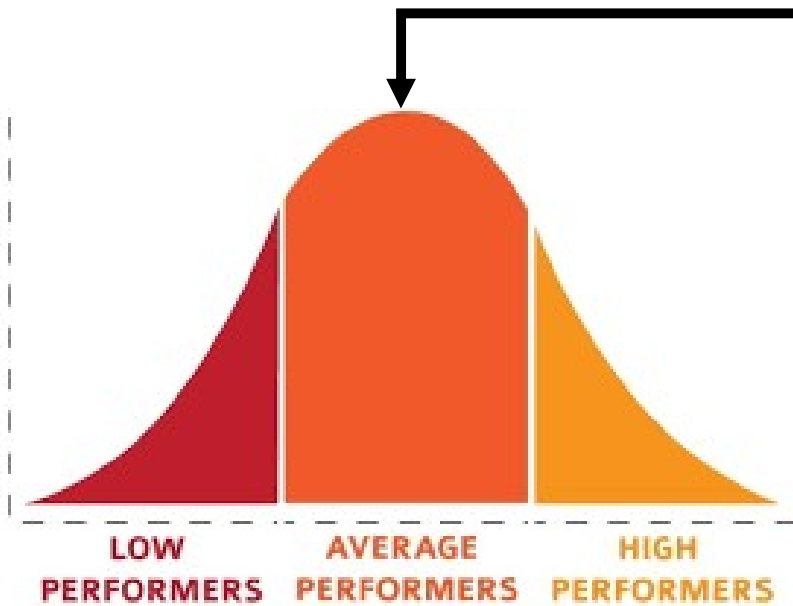
What strategies can we use to capture this subset?
- **Cognitive Practices**
- **Clear Expectations**
- **Identifying Faculty Needs**

LOW PERFORMERS   AVERAGE PERFORMERS   HIGH PERFORMERS

Cognitive Practices

1. Retrieval Practice
2. Spaced Practice
3. Interleaving
4. Feedback

Self-assessment is KEY!

Retrieval Practice Strategies – Campus & Zoom

- Share the 'why' with the students
- Mini-Quizzes *before* lecture (based on reading)
- Brain Dump
  - MAE 1502 Principals of Engineering: 'Recall Engineering' – two minute dump on paper each lecture.
    - Good lecture break
    - Mix of today, last week, etc. AND ideas for future lectures
    - Think Pair Share
    - Part of their participation grade (5% of the class)
  - MAE 3320 Biomass Energy Analysis
    - Covers multiple lectures
    - Students love getting to help design the course
    - Competitive!!
    - Welcome break on Zoom

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Breakout Room KNOWLEDGE BOMB!!

- 5 Rooms
- 10 Minutes
- Summarize group thoughts in main chat

❑ Enter two questions you have about today's lecture.

❑ Enter two things from last week. NO NOTES!!!

❑ What do you want me to cover next week? Specific Details Please!!!

Spacing and Interleaving Practices

- Prime ratio is 1:10 – To remember 30 days, do a retrieval every 3 days
- Canvas tools make this easy & relevant in class and remote
  - Discussions on this week's topic with requirement to include a specific past lecture
  - Low stakes Friday 'Mini Quizzes' over EVERYTHING
    - Students know if they got the right answer
    - Can regain points by explaining what they don't understand
  - Mandatory 'homework help discussions' on lower-level classes
    - My homeworks frequently have one problem from past chapters
    - I devote as much time to encouraging mistakes, confusion, and wrong answers as I do to helping
- Use in-class exercises for breaks

Time to Baffle Julie!

- 5 Minutes
- Main Chat

❑ **Enter two questions you have about last week's lecture.**

❑ **Ask one thing about any topic!**

Feedback – Honesty and Trust

- Realizing some failure is good reduces student learning anxiety and builds confidence
- I model this by having them try to stump me.
- Everything counts towards their grade
- You don't need to do it all
  - Zoom students LOVE the small 'social time' in breakout rooms AND they always get the job done
  - Example problems or applications in classroom groups and breakout rooms you visit
  - Encourage questions
- Make retrieval warmups fun and/or competitive – 'What time did Julie wake up today?'

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Breakout Room KNOWLEDGE BOMB!!

- 3 Rooms
  - Retrieval
  - Spacing and Interleaving
  - Feedback
- ? Minutes
- Summarize group thoughts in main chat or verbally

❑ Enter two questions you have about today's lecture.

❑ What did you like most about today's talk?

❑ What additional questions do you have?

Clear Expectations (Discussion Points)

Identifying ways that we can apply methods across courses so to help students strengthen their resilience and ability to self-assess.

For example:

"This student emailed me before investigating on their own."

How can we handle this consistently as a faculty?

AND THE WINNER IS…

?