



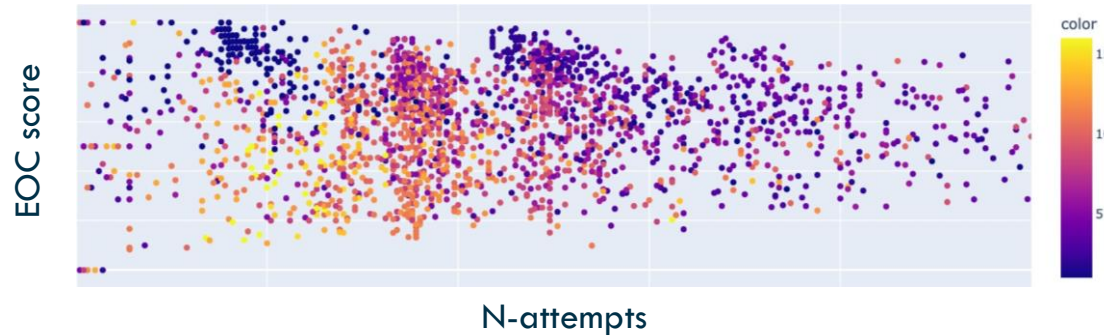
Envisioning with CourseKata: Maximizing Productive Struggle and Engagement

Team Barbie

CourseKata's engagement plateaus as student's progress through chapters

Convergence of EOC scores given n-attempts provides insights about lower-scoring student behavior and cumulative materials

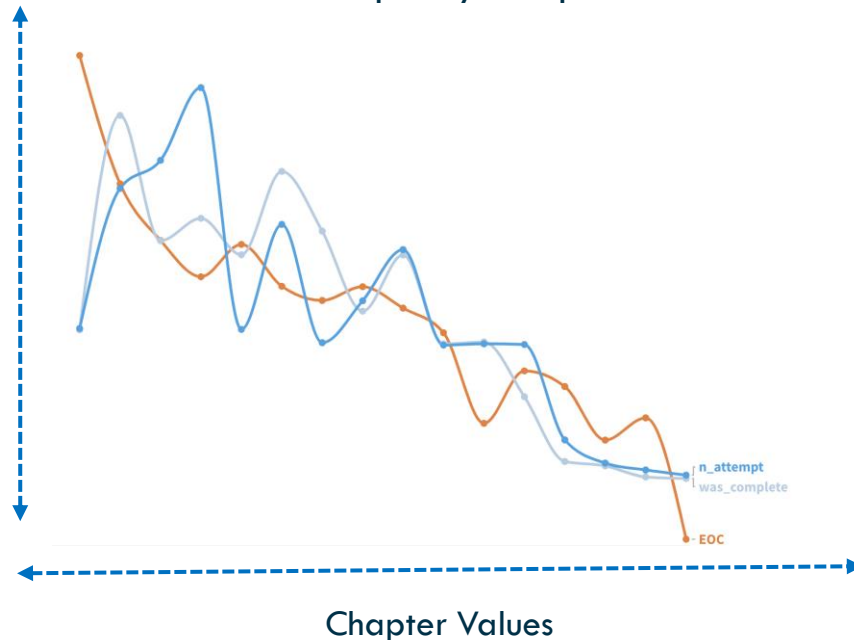
EOC vs. N-attempts by Chapter Number



Stratified Chapter Attempts:

- Students make less attempts as they progress through chapters
- Students fail to engage in connective learning between chapters

EOC vs. N-attempts by Chapter Number



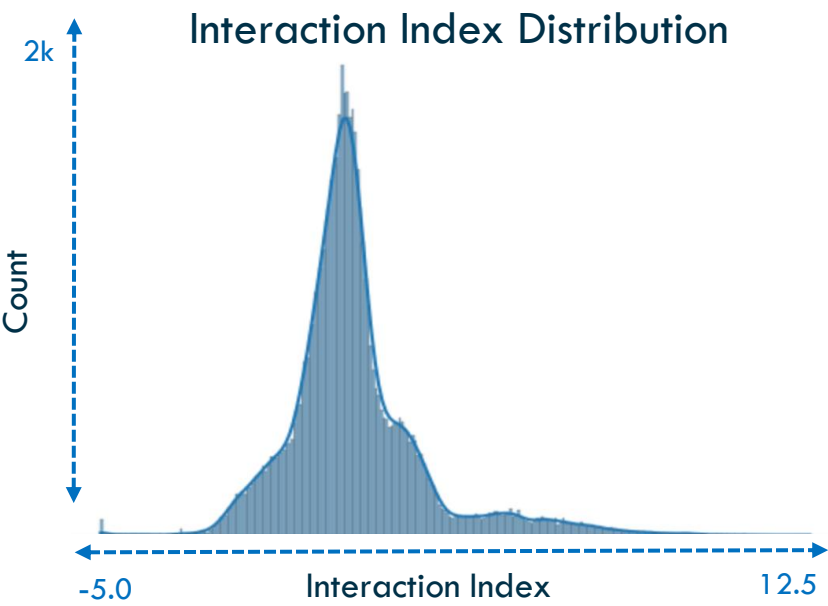
EOC Score:

- As students progress through chapters *EOC*, *attempts*, and *was complete* decreases
- Reflects a lack of deliberate practice

Feature engineering allows for greater insight with engagement

Future measurement of modulated variables can help CourseKata's students improve engagement and in extension EOC scores

$$\text{Interaction Index} = Z_score(\log(\text{Engage})) + Z_score(\log(\text{Tried again clicks})) + 2 \times \text{Was Complete}$$



Variable	Log engaged	Log tried again clicks	Was complete	Interaction index
Log engaged	1.00	0.063	-0.354	0.433
Log tried again clicks	0.063	1.00	0.196	0.754
Was complete	-0.354	0.196	1.00	0.488
Interaction index	0.433	0.754	0.488	1.00

The correlation coefficients between the transformed variables and interaction index suggest that the transformation has **captured meaningful relationships** with the target variable

Interaction Index: Feature Engineering Procedure

1. Apply logarithmic transformation onto Engage and Tried again clicks to reduce right skewness
2. Merge 'engaged' and 'tried again clicks' to create a composite index by summing z – scores
3. Add weights (weight = 2) to 'was complete' to create a stronger indicator

Recommendations & Next Steps:



Continual Connections

- Implement compounding practice for decrease variation in EOC vs. *n-attempts* with summary chapters
- Raising the difficulty and increasing connections between problems to meet growing capability of students



Collecting Data

- Measure and segment problem id's by chapter and section to implement problem specific analysis