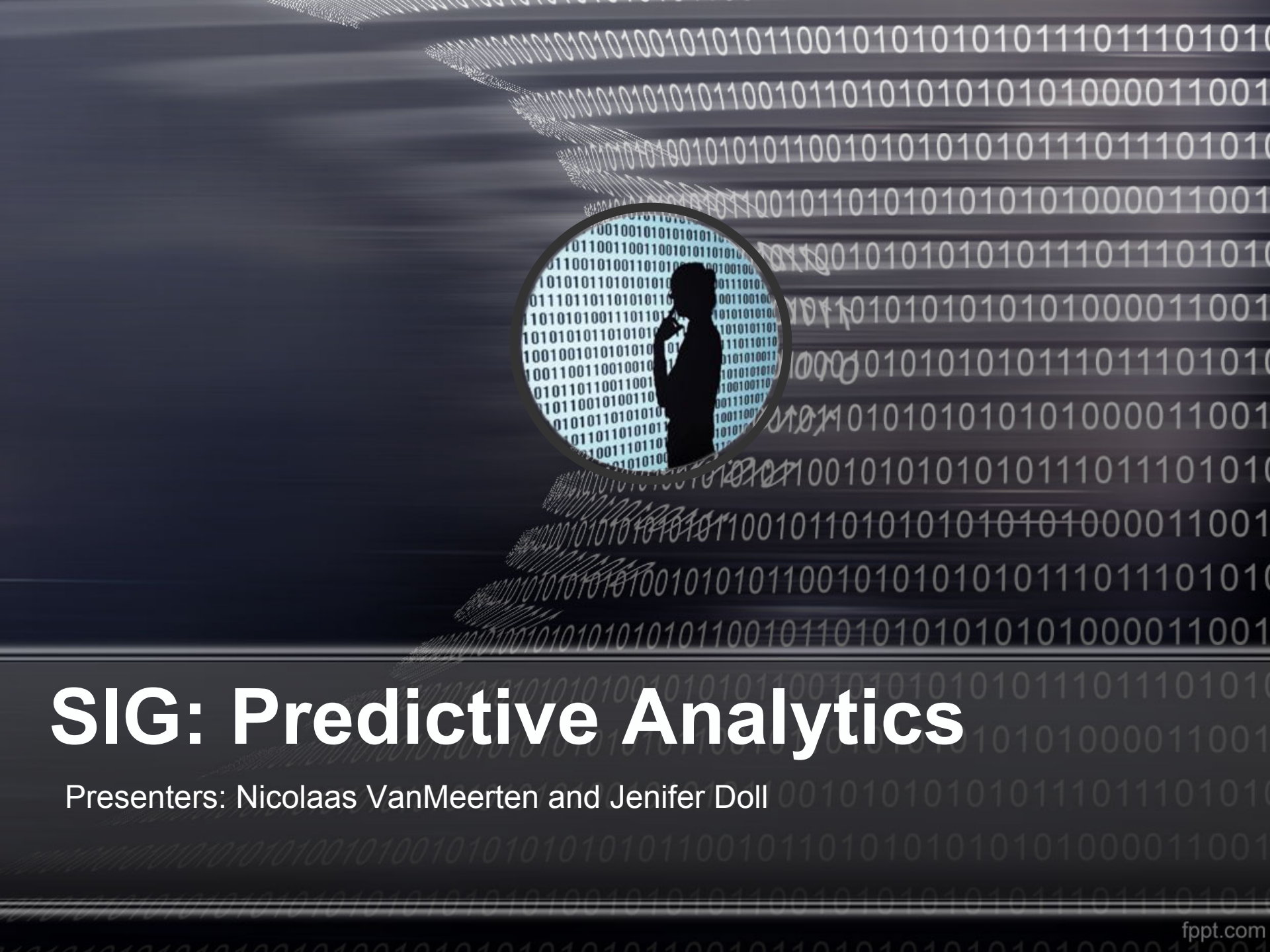

SIG: Predictive Analytics

Presenters: Nicolaas VanMeerten and Jenifer Doll

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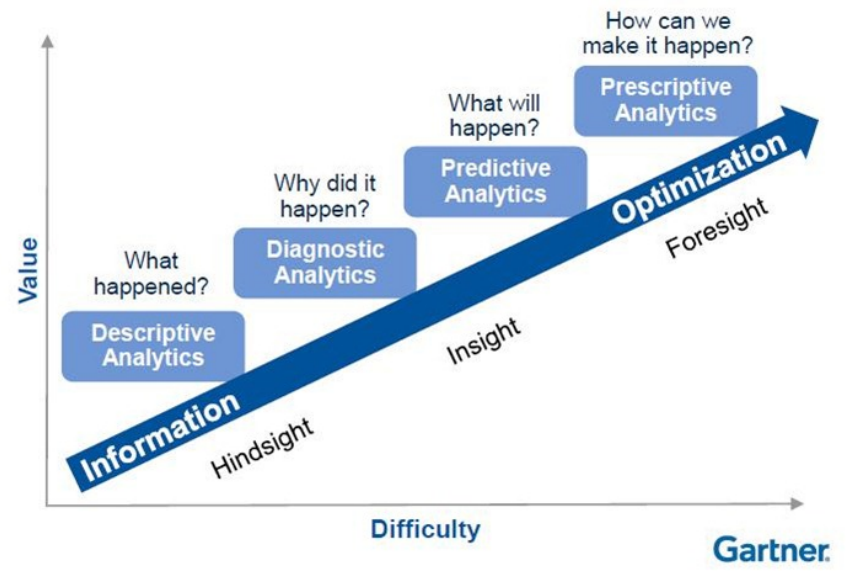
Definition



Predictive analytics is the use of data, statistical algorithms and machine-learning techniques to identify the likelihood of future outcomes based on historical data.

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The Broad Impact of Predictive Analytics

- Credit Scoring
- Fraud Detection
- Marketing
- Political Campaigns
- Law Enforcement
- College Admissions
- Healthcare
- Transportation Systems
- Search Engines
- Social Networks

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Your Thoughts?

- What applications do you see for predictive analytics in education?
- In your specific discipline, what would you like to be able to predict?

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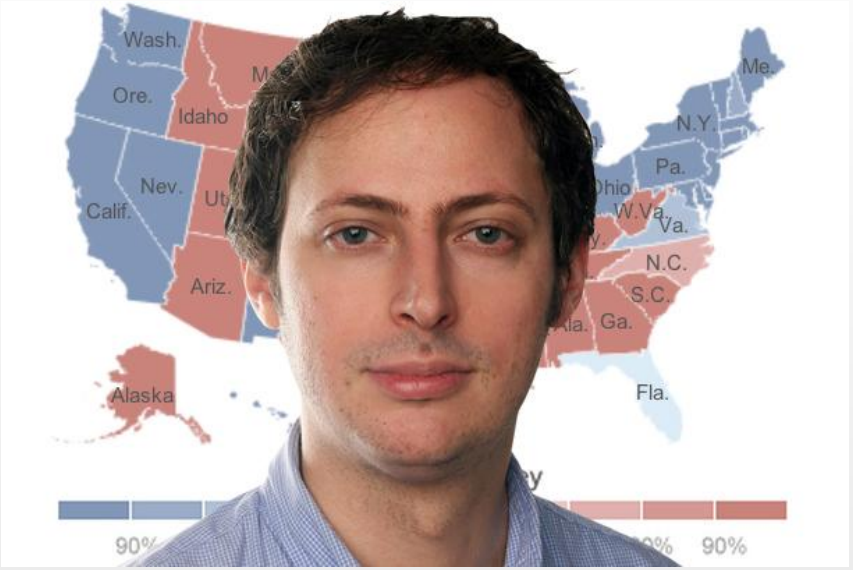
Predictive Analytics vs. Forecasting



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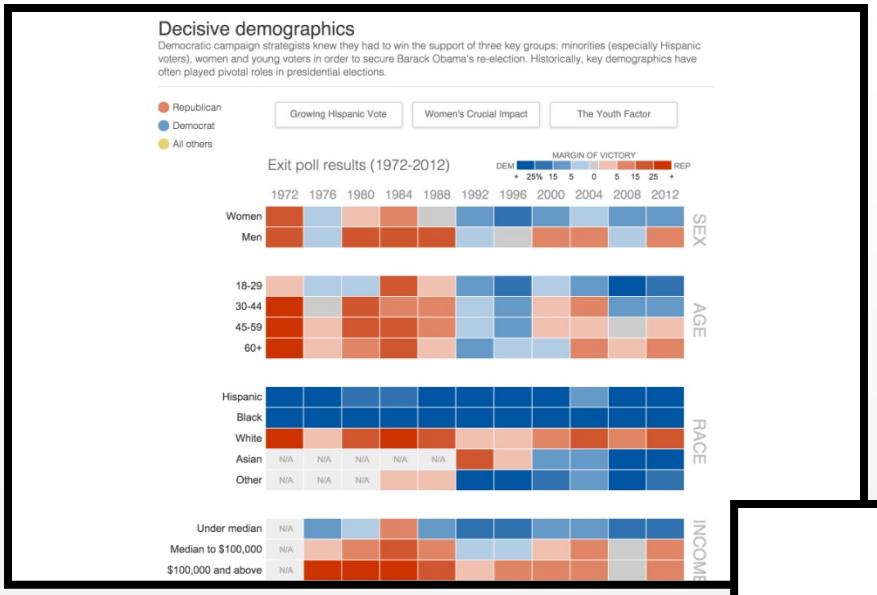
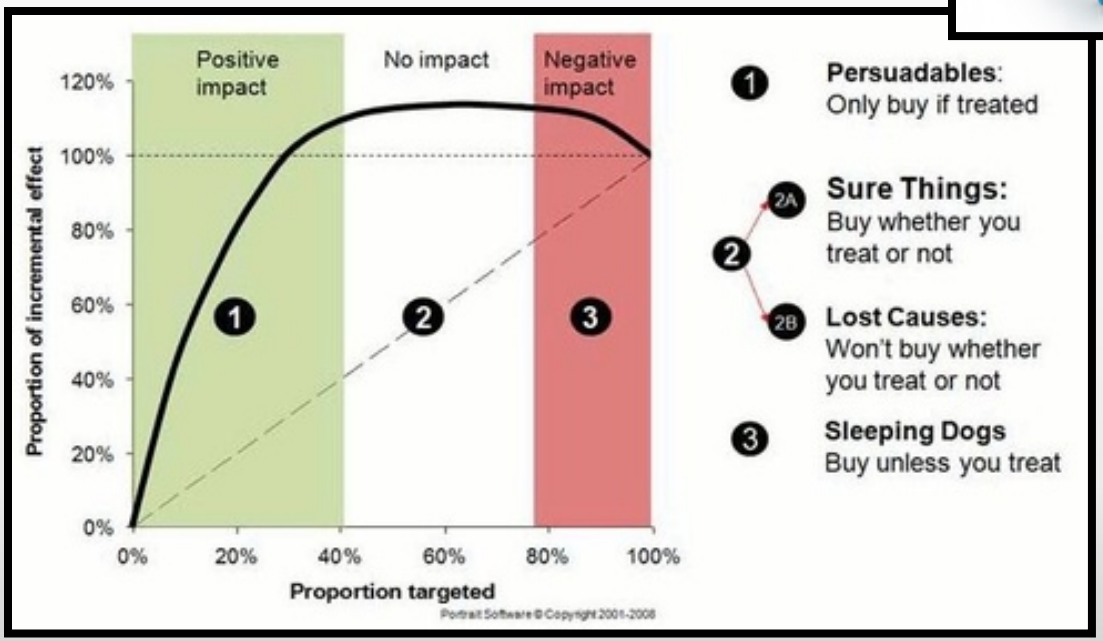
Predictive Analytics vs. Forecasting



Forecasting involves analyzing *tends* in aggregate

Predictive Analytics vs. Forecasting

Predictive Analytics creates *models* of behavior



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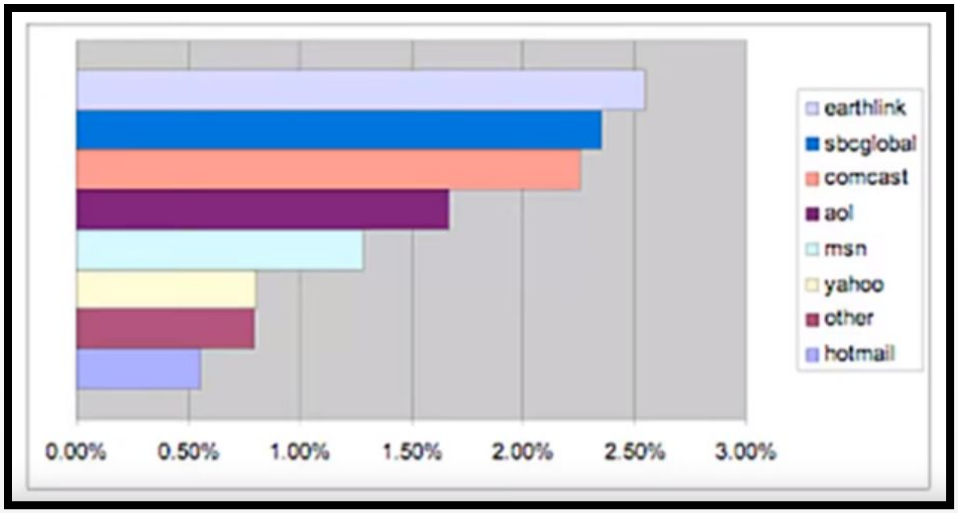
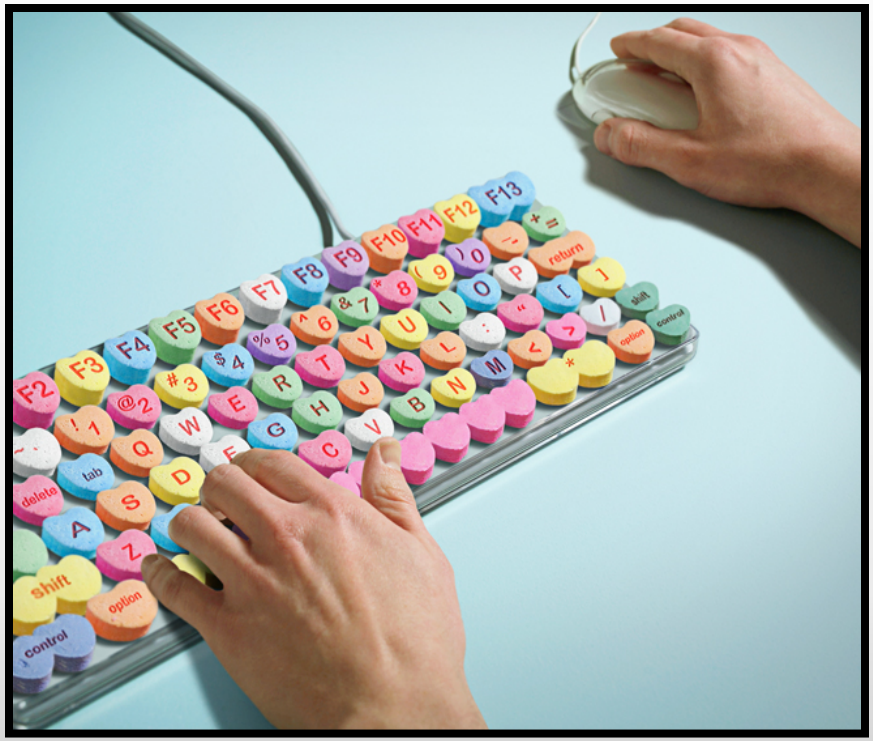
Correlations and Prediction



One marketing project found that user email domain corresponded to subscription acquisitions



There does not need to be a causal link between email domain and subscriptions in order for this information to be useful.

Interpretations can be made as to why this correlation exists, but the focus of the email marketing campaign is clear regardless.

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Training Data and Constructing Models

- Training data is analyzed to identify possible predictive relationships
- The next step is to build models which can make predications for new data points
- The correctness/incorrectness of these predictions can then inform the model to make it more effective

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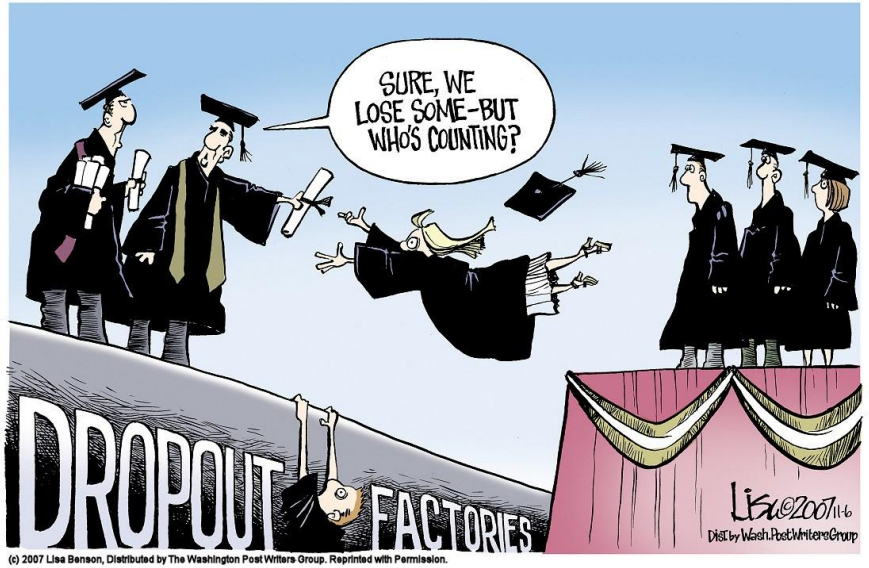
In Education

- Improving student performance
- Increasing student retention
- Managing enrollment more effectively
- Supporting institutional advancement
- Improving financial aid management
- Enhancing campus security



Example Goals:

- Self-generated Interventions
- Intelligent Recommendation Feedback
- Resource Allocation

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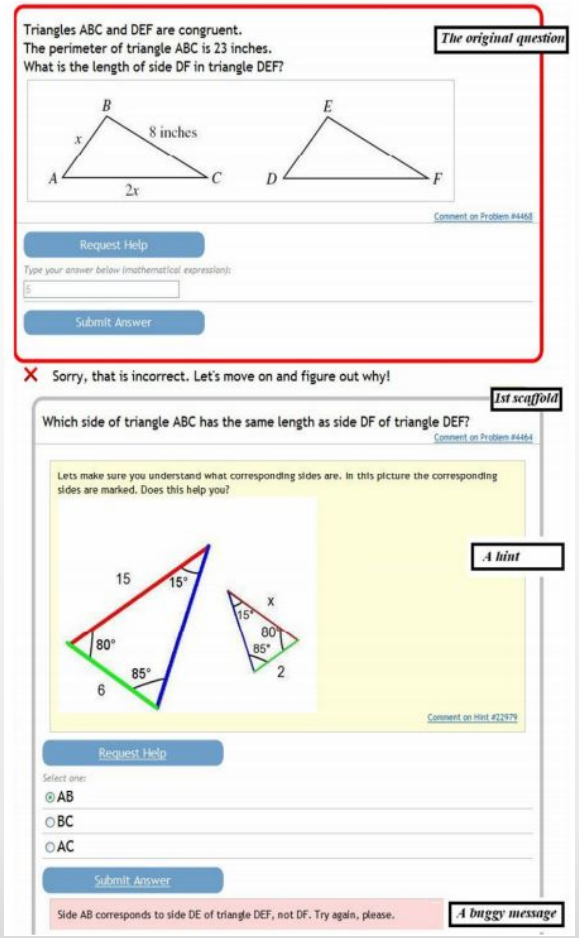
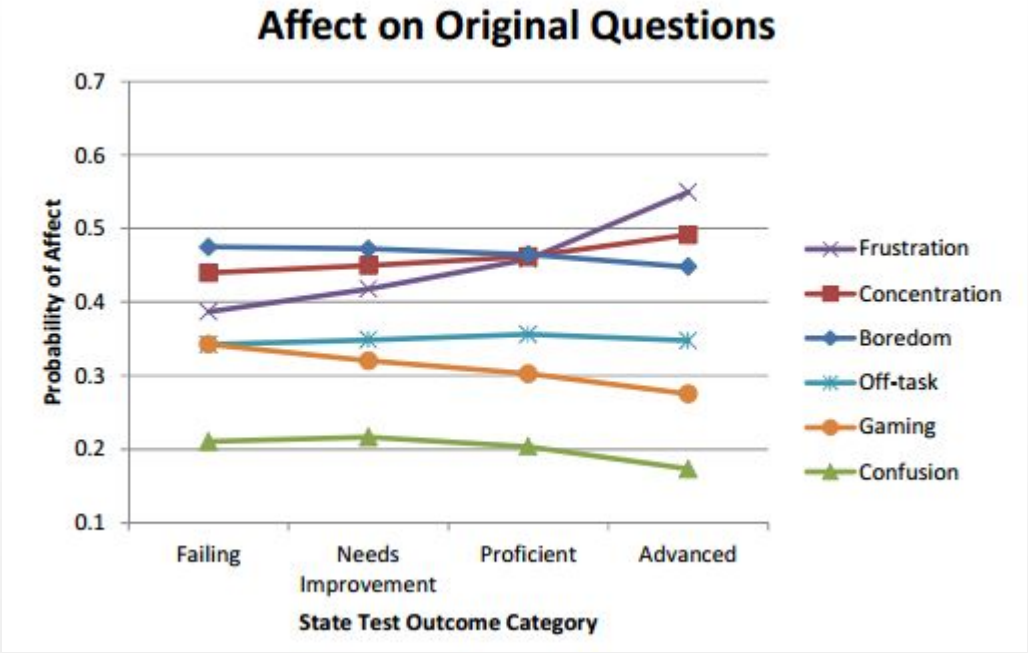
Affective States and State Tests





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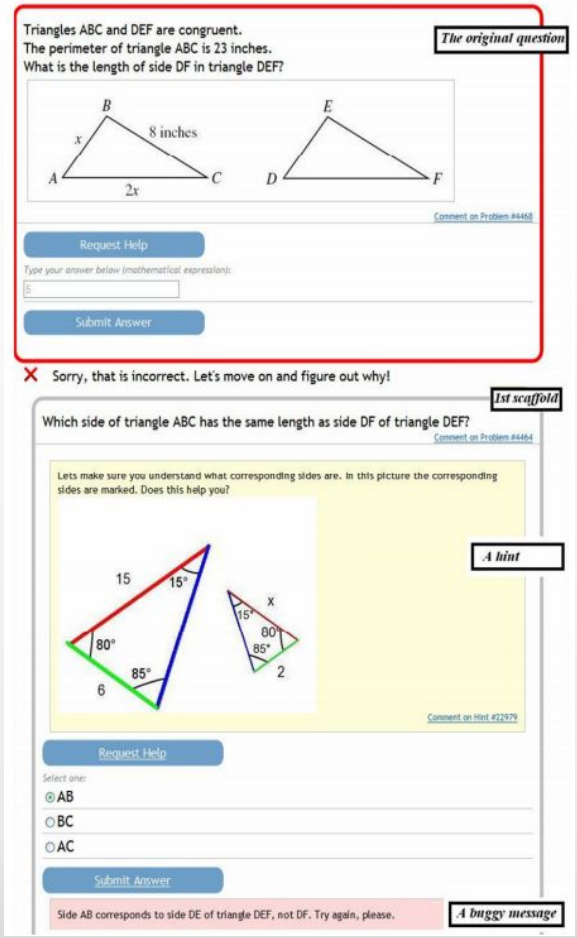
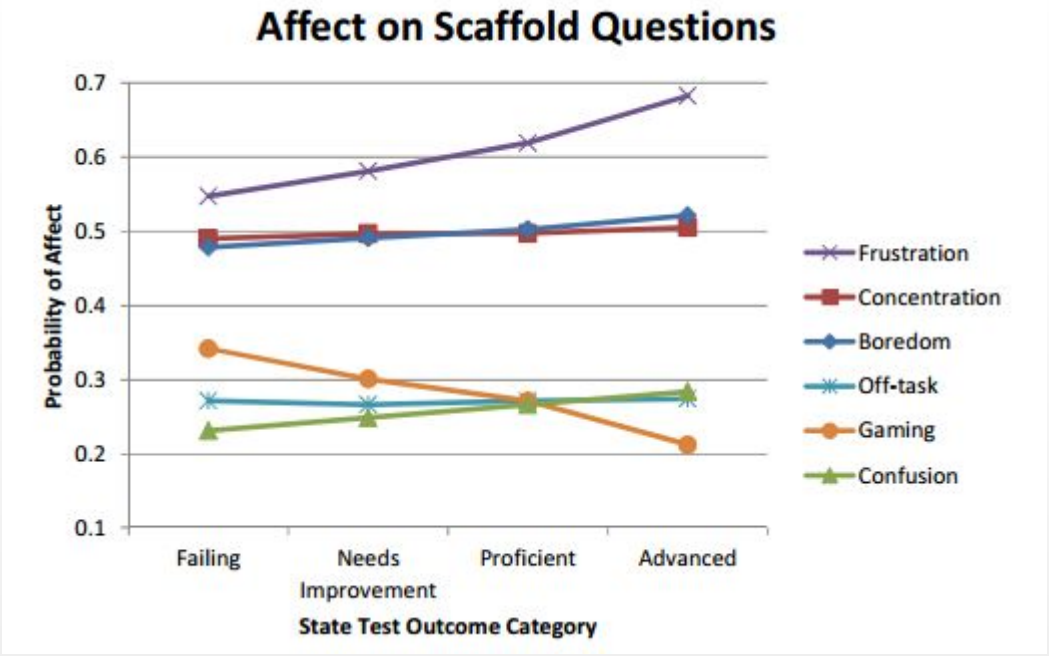
Affective States and State Tests





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Break and Activity

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Ethics

- Do students have a right to know exactly what data is being tracked and are they then entitled to the interpretations of what that data indicates about them based on the model in use?
- Does “knowing” something via predictive analytics entail an obligation to act on the knowledge?

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