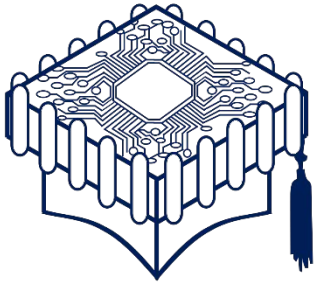
Ryan S. Baker



Penn Center for Learning Analytics

University of Pennsylvania

Learning Analytics in a Military Context

- Using data science to study trainees and training
- To enhance training outcomes
- And ultimately produce better performance

SOLAR
SOCIETY for LEARNING ANALYTICS RESEARCH

Many types of LA/EDM Method

(Baker & Siemens, 2014; building off of Baker & Yacef, 2009)

- **Prediction**
- **Structure Discovery**
- **Relationship Mining**
- **Discovery with Models**
- **Visualization**

Key applications

- Failure/success prediction

Key considerations

- Who is at risk and why?
- Risk factors may differ between contexts and populations
- Example: Factors associated with high school drop out are different for military-connected students than non-military connected students (Berning & Baker, 2018)

Key considerations

- Infer something that matters, so we can do something about it
- Focus on finding *actionable* predictors

- Drop out predictions have been a big success – associated with significantly lower drop out in both higher ed and K-12

Can be applied at greater or shorter durations

- From
- Prediction of next activity success
- To
- Performance in real-world activities well into the future
  - 11 year longitudinal prediction in ASSISTments Longitudinal Data Challenge

Key applications

- Automated detection of learning, engagement, emotion, strategy, complex reasoning and skill
  - Leading to better individualization and better learning outcomes
    (Baker et al., 2006; Moussavi et al., 2016; DeFalco et al., 2018)

Key applications

- Better reporting for instructors, academic advisors, course designers
  - Course sequence impact (Pechenizkiy et al., 2012)
  - Student progress (Baker et al., 2015) or negative affect/disengagement (Holstein et al., 2018)
  - Content effectiveness (Agarwal et al., 2018)

Potentials

- Infer which trainees are at-risk for poorer post-training performance, based on actionable features of their behavior

Potentials

- Infer which trainees are likely to excel, post-training, based on actionable features of their behavior

Potentials

- Infer which training experiences are most likely to benefit individual trainees

Potentials

- Adapt during training experiences when trainees are experiencing negative affect, disengagement, or not making progress

Thank you!

Baker EDM Lab

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EdX MOOC/MOOT "Big Data and Education"
All lab publications available online – Google "Ryan Baker"