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Learning Analytics in a Military Context

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

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