A Design and Evaluation Framework &
Deconstructing Disengagement
Two Projects Establishing Baselines for MOOC Research

Emily Schneider
René F. Kizilcec

Design and Evaluation Framework
Grover, Franz, Schneider, and Pea, CSCL’13

Distributed Intelligence Lens
- Resources that shape and enable learner activity are “distributed in configuration across people, environments, and situations” Pea, 1993
- A MOOC is a designed object made up of interrelated dimensions shaped by various stakeholders - faculty, technologists, instructional designers, researchers, and learners

Implications
- Learning outcomes should be defined variably in relation to learner background and intentions, and expansively in terms of desired outcomes (affective, collective, etc.)
- Design and research on MOOCs must account for interplay between all dimensions and contribute to the cycle of evidence-based improvement

Deconstructing Disengagement: Identifying Learner Subpopulations
Kizilcec, Piech, and Schneider, LAK’13

Motivation
- MOOC participation reflects the plurality of learners’ intentions and backgrounds
- Identify subpopulations of learners to target interventions and develop adaptive course features
- Classification methods for MOOC subpopulations should be
  - universal – valid across multiple courses
  - longitudinal – reflect the processes of learning
  - predictive – suggest effective interventions
  - diagnostic – expose effects of course format
  - dynamic – account for new information over time

Approach
- Identify learner subpopulations based on longitudinal engagement with assessments and videos
- Analysis of 3 Stanford CS MOOCs at varying levels of difficulty: CS 101 (High School), Algorithms (Undergraduate), Probabilistic Graphical Models (Graduate)
- Clustering to extract prototypical trajectories of learners

Link to paper
http://goo.gl/L7TCS
or scan the QR code

Four Prototypical Trajectories

Consistent across 3 Trajectories:
Auditing learners watch lectures throughout course, but attempt very few assessments
Completing learners attempt majority of assessments offered in course
Disengaging learners attempt assessments at beginning of the course, but then sparsely watch lectures or disappear entirely
Sampling learners briefly explore course by watching a few videos

Interpreting Cross-Trajectory Comparisons

Overall Experience
Completing and Auditing learners have a better experience than Disengaging learners
- Identify Auditors early (via self-report or algorithmic) and design course features for them, e.g. reducing emphasis on assessments

Discussion Forums
Completing learners more active on forum
- Encourage forum participation with reputation system or social incentives, and study changes in participation from subpopulations

Video Streaming
Consistently more streaming than downloading in HS-level course: maybe due to in-video programming exercises
- Study how different assessment types in videos affect streaming behavior and learning outcomes