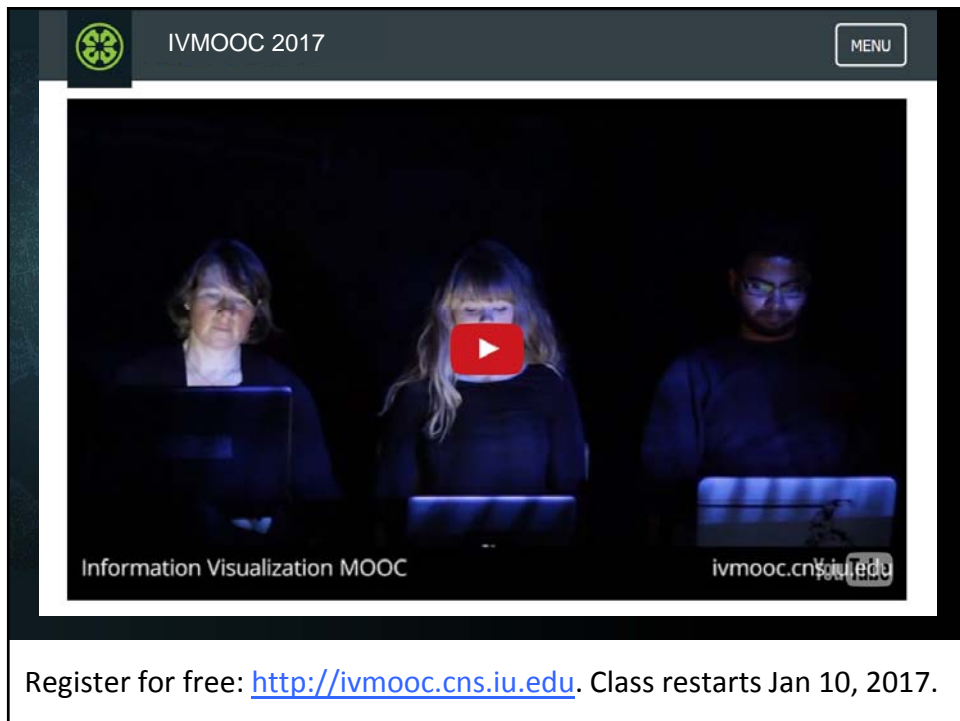



Ψ RESEARCH HORIZONS 2016
Katy Börner


Visual Analytics: Empowering Teachers, Students, Researchers, and Leadership

COLLABORATORS
Michael Ginda, Robert Light, Scott Emmons, David Wild & Ying Ding, SOIC, Raymond Burke, KSB, Robert Goldstone, PBS@COAS, Dennis Groth, VPUE, Daniel Hickey, SoE, Michael Kaganovich, Economics@COAS, George Rehrey, Director of SOTL, Anastasia Morrone, Assoc. VP for Learning Technologies, OVPIT; Dean of IT at IUPUI, Jennifer Robinson, Anthropology@COAS, Linda Shepard, Director of Bloomington Assessment & Research, Timothy F. Slaper, Indiana Business Research Center, Ali Jafari, Course Networking, LLC

INDIANA UNIVERSITY
SCHOOL OF INFORMATICS AND COMPUTING

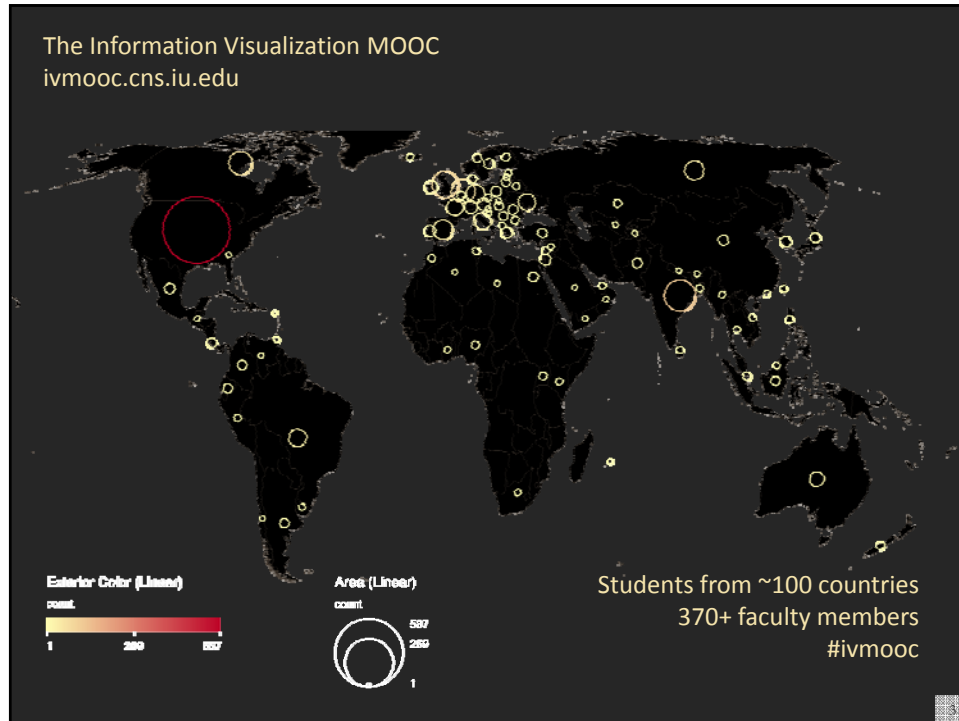


 IVMOOC 2017 MENU



Information Visualization MOOC ivmooc.cns.iu.edu

Register for free: <http://ivmooc.cns.iu.edu>. Class restarts Jan 10, 2017.



Learning Analytics



Empowering Teachers: How to make sense of the activities of thousands of students? How to guide them?

Empowering Students: How to navigate learning materials and develop successful learning collaborations across disciplines and time zones?

Empowering Researchers: How do people learn? What pedagogy works (in a MOOC) and when?

Empowering MOOC Platform Designers: What technology helps and what hurts?



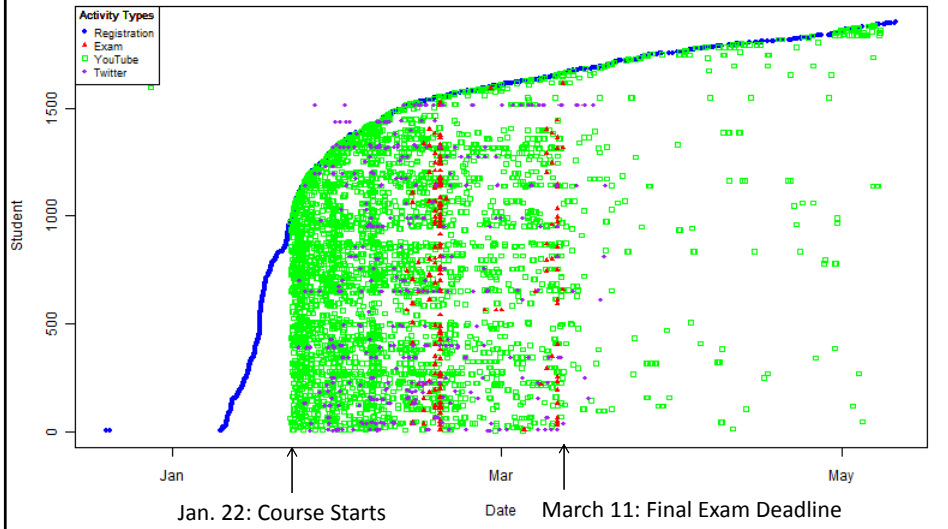
Visualizing IVMOOC Data

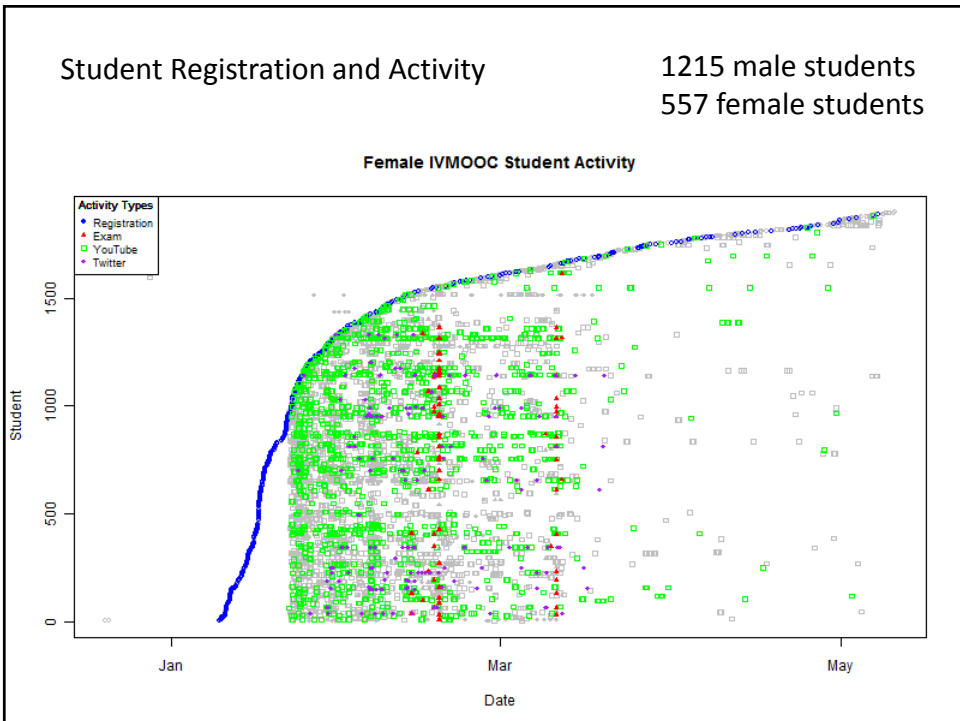
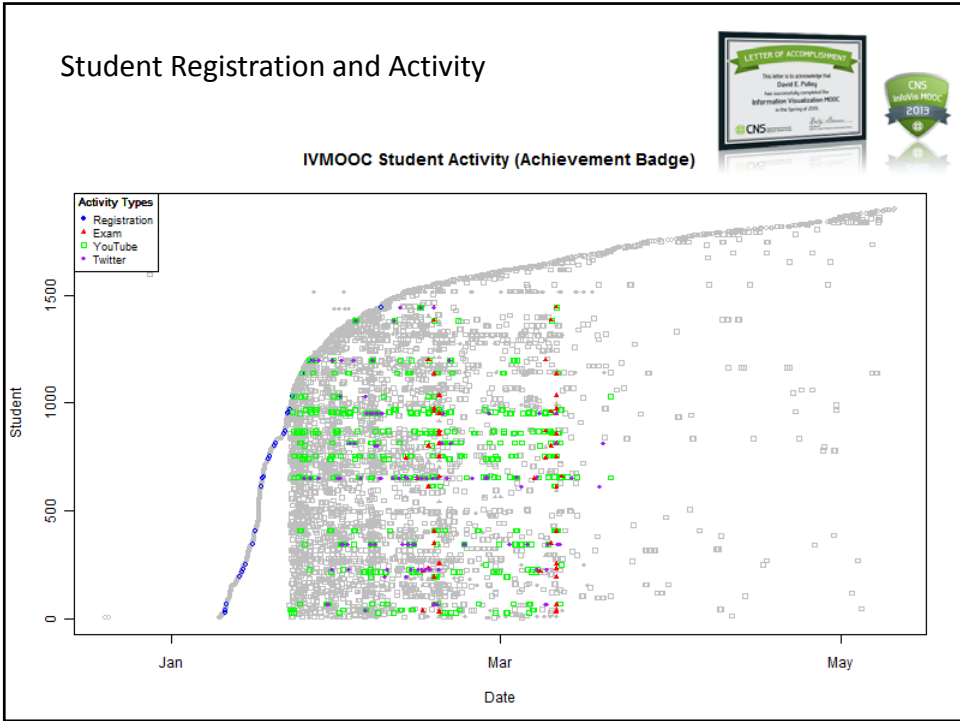
Data was collected from different sources:

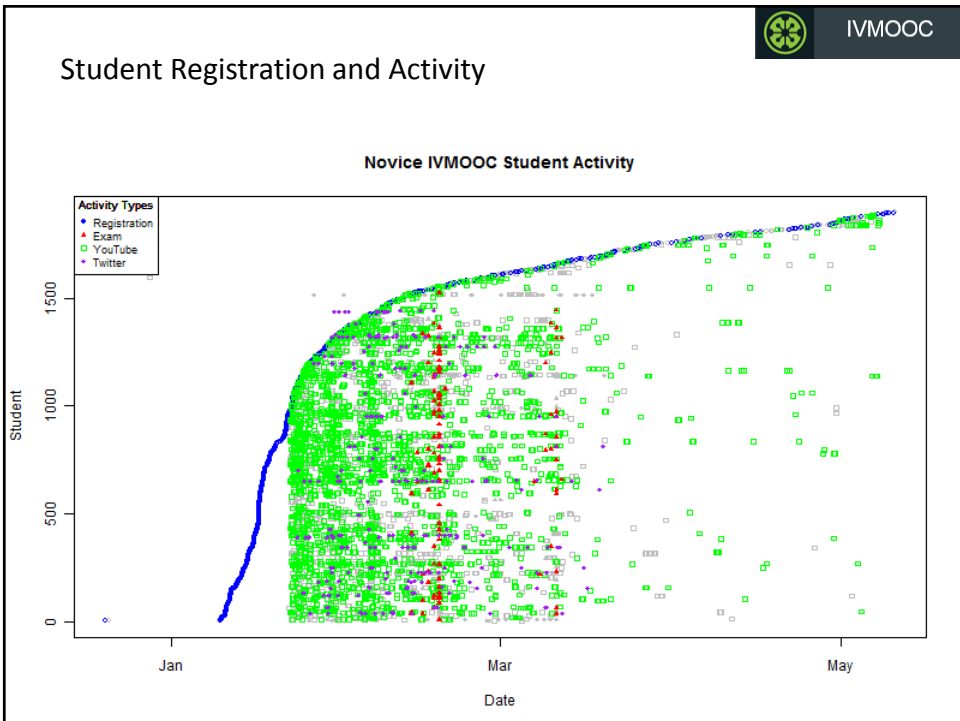
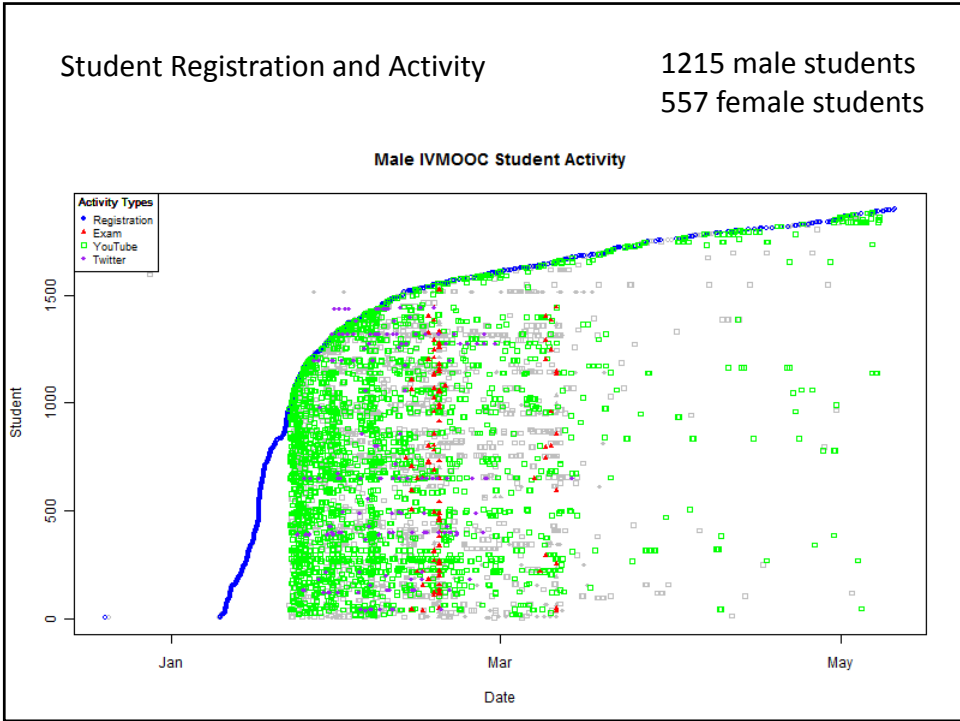
- 1,901 students registered via GCB (1215 male/557 female)
- 52,557 slide downloads from our server
- 18,893 video views via YouTube
- 193 accounts made 730 tweets
- 134 students took 183 exams in GCB
- 674 remarks on 215 different forum threads in Drupal
- 64 students submitted projects via Drupal

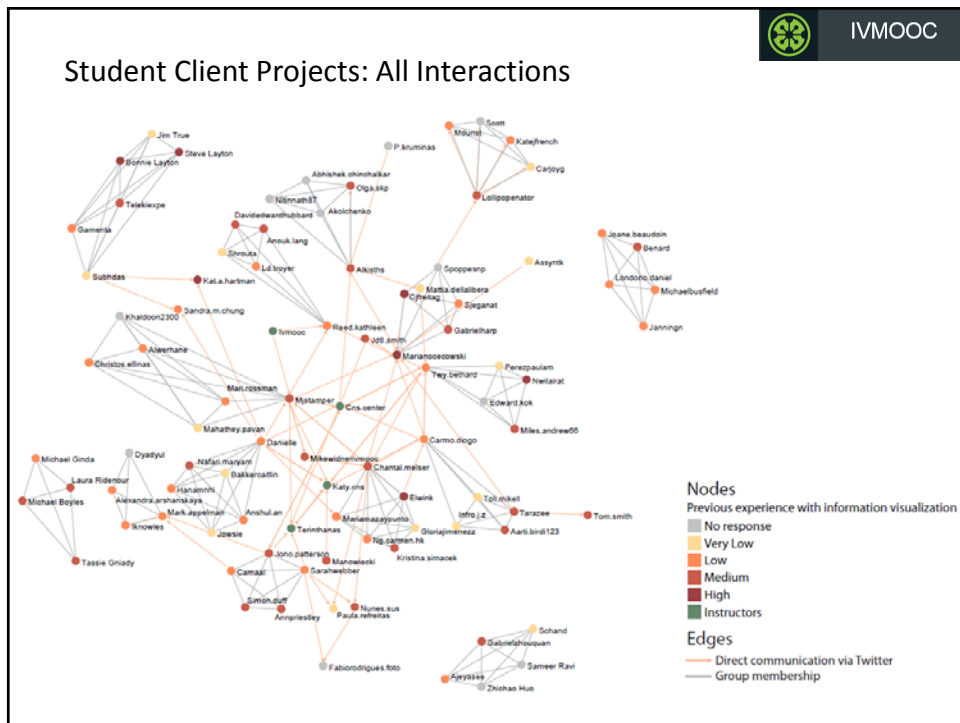
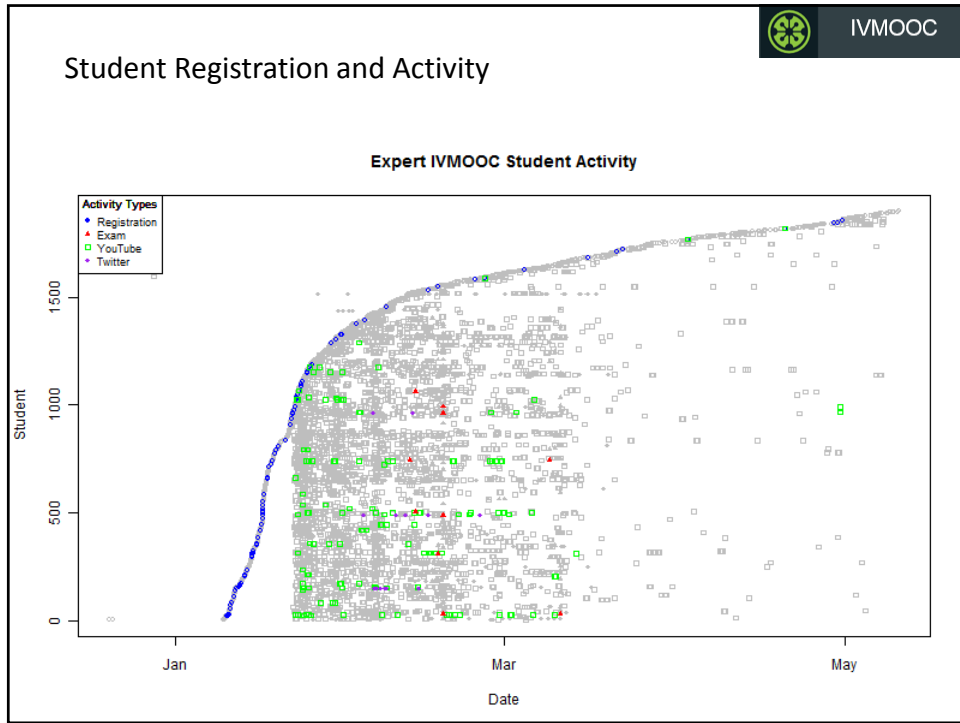


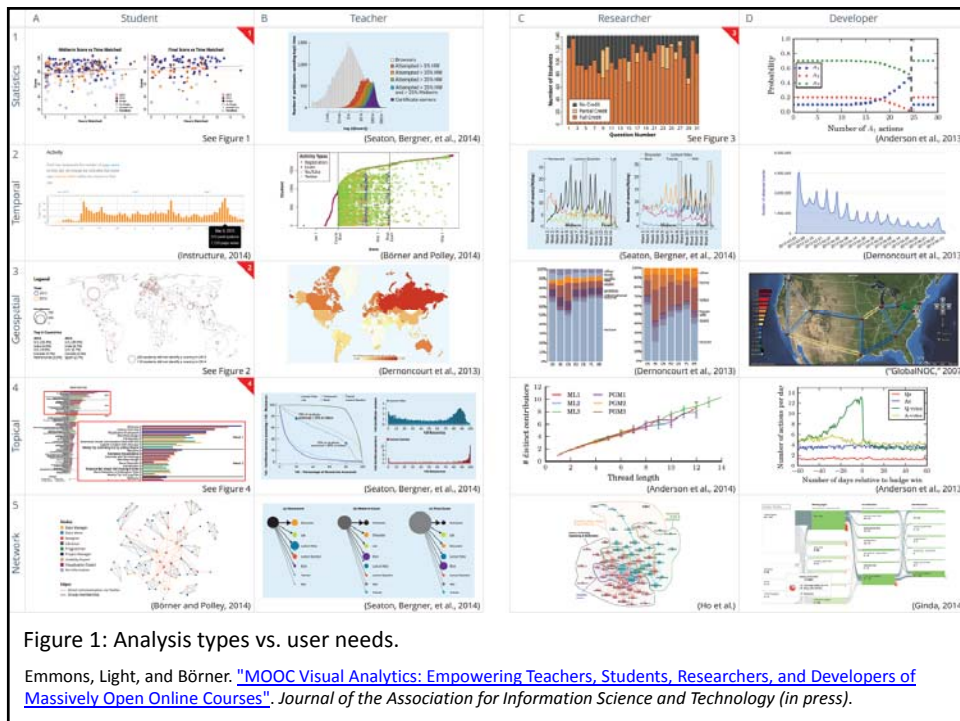
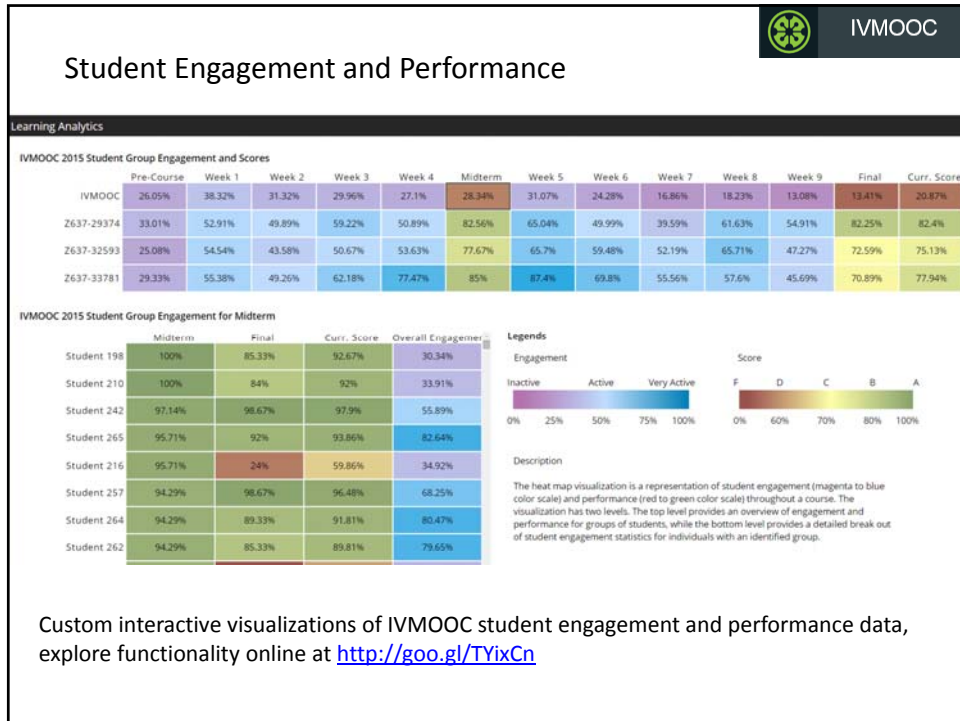
Student Registration and Activity











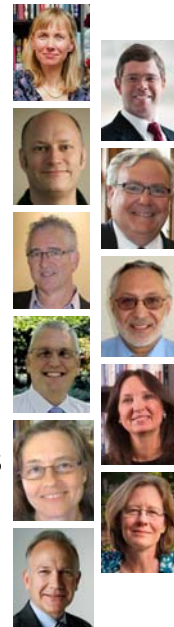
Educational Data Science: Precision Learning, Teaching, and Leadership *IU Emerging Area of Research Proposal*

“We will develop, validate, and optimize models that explain and help predict the impact of different interventions on student success at IU and in life.”



The Team

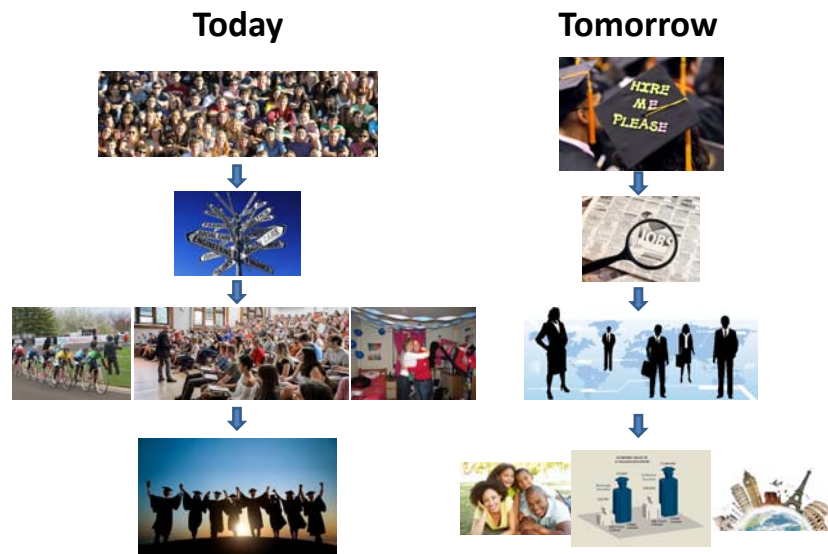
- **Katy Borner**, Victor H. Yngve Distinguished Prof of Information Science, ILS, SOIC
- **Raymond Burke**, E.W. Kelley Prof of Marketing, KSB
- **Robert Goldstone**, Chancellor’s Prof, Psychological & Brain Sciences, COAS
- **Dennis Groth**, Vice Provost for Undergraduate Education
- **Daniel Hickey**, Prof, Learning Sciences Program, SoE
- **Michael Kaganovich**, Prof of Economics, Economics, COAS
- **George Rehrey**, PI Consultant with IU’s CITL; Director of SOTL
- **Anastasia Morrone**, Prof of Educational Psychology, IUPUI School of Education; Associate Vice President for Learning Technologies, OVPIT; Dean of IT at IUPUI
- **Jennifer Meta Robinson**, Prof of Practice, Anthropology, COAS
- **Linda Shepard**, Senior Assistant Vice-Provost for Undergraduate Education; Director of Bloomington Assessment & Research
- **Timothy F. Slaper**, Indiana Business Research Center, IUB



Big Questions

- What would college students, faculty, and other stakeholders do differently if they had easy, first-hand access to the data already created by college life in the information age?
- What wisdom about learning and life could students actualize from pathways visualized through documents, data, code, expertise, laboratory outcomes, class performance, and grades?
- What leverage points for learning could faculty discern and operationalize?
- What interventions should faculty/units/institutions implement for positive gains?

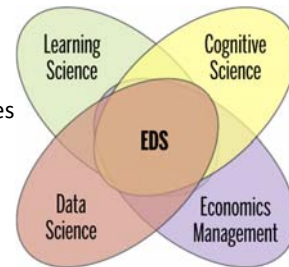
Changes in Higher Education



Research Cores

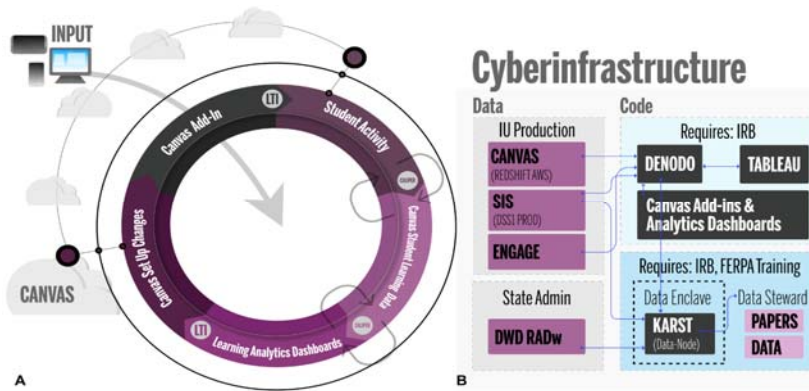
The team will perform cutting-edge, interdisciplinary research in **Educational Data Science (EDS)** at the intersection of four research areas:

- **Cognitive Science > Classroom Experiments** investigates the cognitive and social variables, patterns, and leverage points in learning and teaching.
- **Learning Science > Student Support** investigates the impact of curricular interventions on student success at IU and in life.
- **Decision Science: Economics of Higher Education** investigates the economic value of education across scales—from micro to macro. **Management/Student Choice Research** investigates the impact of incentives and educational product offerings on short-term and long-term decision making.
- **Data Science > Learning Analytics** performs research on data mining, modelling, and visualization techniques that increase “data (visualization) literacy” and data-driven decision making.



Cyberinfrastructure Core

- Implements novel means to provision sensitive data via secure data enclaves and federated Denodo virtualized databases.
- Develops novel functionality for existing learning management systems (LMS) such as Canvas using LTI and Caliper.
- Uses/extends Tableau to serve actionable dashboards for IU leadership.



Establishing EDS and Ensuring IU Leadership

Capitalizing on existing IU strengths:

- Student Learning Analytics (SLA) Fellows Program
- Scholarship of Teaching and Learning Program
- Learning Technologies, UITS
- Learning Science Research, PBS, COAS
- Cognitive Science Program, IUB
- Learning Sciences Program, School of Education
- Bloomington Assessment and Research (BAR) office
- Indiana Business Research Center, <http://ibrc.indiana.edu>
- Decision Support Initiative, <http://dsi.iu.edu>



Proactive collaborations with other institutions:

- Unizin—11-institution digital learning consortium, <http://unizin.org>
- Bay View Alliance—8-institution Student Learning Analytics (SLA) initiative



RESEARCH HORIZONS 2016
THANK YOU

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