Practical Learning Analytics: Putting Data to Use in Support of Teaching and Learning

Tim McKay
Professor of Physics, Astronomy, and Education
Director of the LSA Honors Program
Learning analytics: What’s new and what’s not

- Institutions of Higher Ed have kept a careful record of student progress and measured outcomes for more than a century
- We have always been ready to testify to an individual student’s record, and to recount summary results of collective student work

- What’s new: increasingly extensive, accessible data allow us all, faculty, staff, and students, to better understand everything we do
- We should press to make the way we understand our work reflexively evidence-based
Learning Analytics at Michigan

- **1996: Data Warehouse**
- **2002: Early access – ART 1.0**
- **2008: Research expands with the BTE & LMS projects**
- **2011: Comm. building SLAM**
- **2012: LA Task Force**
- **2013: CIC, LA Fellows**
- **2014: DEI: Office of Digital Education and Innovation, ART 2.0, UNIZIN**

**Provost’s LA Task Force**

- Faculty committee building a LA community of practice
  - $2M Exploring Learning Analytics Grants Program
  - Symposium on Learning Analytics at Michigan: 4th year
  - Learning Analytics Fellows Program => PLA MOOC

- Important impacts across a range of activities
  - Analyses, Tools for intervention, New practices
LATF accomplishments

1. **Analyses:** answering questions with data
   - Better-and-worse than expected, grade penalties
   - Pathways to degrees, program impacts, placement

2. **Tools for intervention:** acting on data
   - Student Explorer, E²Coach, ART 2.0, GradeCraft
   - Personalizing Education for the 21st Century

3. **Practices:** an evidence-based campus
   - Help everyone use data to answer their questions
   - Data supports reform: $2M NSF, $1.5M HHMI grants
Performance prediction and grade penalties

• Who does better (or worse) *than expected*?

• The single best predictor in our student record data is GPA in other classes (GPAO)
  – Very salient to the student: part of their identity
  – Recalled by alumni: a summary of experience

• Compare grades in each course to GPAO
  – Courses impose grade penalties and bonuses: average grades lower or higher than GPAO
Are these relations between prediction and performance — these grade penalties and bonuses — the same for all students?
What are the campus-wide patterns of grade penalty and gendered performance difference?

Our 2013 Learning Analytics Fellows program explored this question.

We (I) hypothesize that style of evaluation – timed, high stakes, often multiple choice examinations – plays an important role.

Is this pattern replicated on other campuses, even where instruction is different?
Comparisons across the CIC

• The Sloan Foundation has funded the CIC Learning and Research Analytics project
  – Focusing on student success in STEM on all of our campuses
  – Examining the impact of research on student outcomes: StarMetrics expenditure data
  – Shared tools/analysis

• Premeeting at ISR 8/14: 38 participants, 10 schools

• Full meeting 11/14: Five institution comparison paper in the works
New permanent homes for LA@UM

• DIG: the Digital Innovation Greenhouse
  – Harvests software innovations from the UM educational community, works with user communities to grow them to maturity, and establishes pathways to scale

• LED: the Learning, Education, & Design Lab
  – Provides a campus resource for collaboration and consultation on research projects that investigate the design and use of learning technologies in higher education.
Growing innovations to scale
How to build LA community?

• Learning Analytics Fellows Program:
  – About 30 faculty, grad students, and staff
  – Met two hours a week to talk LA, do projects

• At the request of CIC Provosts, we’re making this available to campuses nation-wide

• **Practical Learning Analytics**: Coursera MOOC launching October 5th – Best way to participate? Gather a group on your campus and make your own LA Fellows Program!
Practical Learning Analytics

- **Practical**: Focused on student record data which every college and university possesses
- **Interesting**: Addressing questions raised by many audiences, including campus leaders, faculty, staff, and especially students
- **Rigorous**: Using large samples of realistic student record and example code to provide analytic teeth
PLA MOOC: a Smörgåsbord
Take what you want, leave when you’re ready

Serving the meal
- LA for Students
- LA for Instructors
- LA for Dept. Leaders
- LA for Administrators
- LA for Course Designers

Setting the table
- Two week introduction
- Background on LA, preparation for the main event

Coffee and conversation
- Two week conclusions
- Lessons from the work of all, thoughts about the future of LA

Data and code support hands-on experience in each of these 5 areas: BYO data, WYO code
What might the learning analytics future hold?

- Students, faculty, and administrators will answer questions with rich data rather than anecdote.
- This will allow each person to learn from the experience of all, rather than the few they happen to talk to.
- Data will become richer, reflecting behavior and learning more closely, revealing where students come from and go to.
- Learning analytics will supply *information* to *people* – We’ll always need to work to ensure that they use it wisely.

9/16/2015