ELI 2018
ANNUAL MEETING
Achieving Student Success through New Models of Learning
EDUCUSE
From Data to Predictions
What are we missing in the learning data?

Serdar Abaci, Joshua Quick, Anastasia Morrone
Learning Technologies, University Information Technology Services
Indiana University
IU eTexts Program
Summary to Date

Platform: UNIZIN ENGAGE

Powered by Unizin

Devices Supported

185,605 Students
8,100 Etexts
2,896 Courses
6,166 Sections

Publishers

- Cengage Learning
- ClassActive
- Flat World Knowledge
- Harvard Business School Publishing
- HEC Montreal
- Helios Digital Learning
- Human Kinetics
- Indiana CPA Society
- International Society of Automation
- IU Press
- Jones & Bartlett Learning
- Macmillan
- McGraw-Hill
- Pearson
- Responsive Learning Technologies
- Sages
- SED-IT
- SimProfessionals
- Taylor and Francis Group
- WDI Publishing
- West Academic
- Wiley
Key Takeaways: IU's research on students’ actual use of and engagements with eTexts

- In a typical semester, students read more in the first four weeks and less in later weeks except during major assessment times; in a typical week, most reading occurs between 5:00 p.m. and 2:00 a.m. from Monday to Thursday, indicating that students use e-texts mainly as a self-study resource.

- Highlighting was the markup feature most used by students, whereas use of the other interactive markup features (shared notes, questions, and answers) was minimal, perhaps because of students' lack of awareness of these features.

- Research found that higher engagement with e-texts (reading and highlighting) correlated with higher course grades.

Abaci, Quick, & Morrone (2017). Student engagement with e-texts: What the data tell us. EDUCAUSE Review
IU Research: Early reading as a success and engagement indicator

- Predictor variables
  - # of days in the first four weeks
  - % of page views in the first four weeks

- Outcome variables:
  - Reading engagement after 4 weeks
  - Course grades

- Results:
  - Significant:
    - # of days in the first 4 weeks
    - % of page views in the first 4 weeks
  - Not significant:
    - Use of any annotation tools
How Predictive Models Work

**INPUT**
- LMS Data
- Student Profile
  - Student Performance
- Other

**ANALYSIS**
- Data cleaning
- Data transformation & normalization
- Data Merge
- Analysis
  - Classification
  - Clustering
  - Regression

**REPORT**
- Prediction
- Visualizations
- Intervention Tools

*Image Source for Visualizations: https://analyse.kmi.open.ac.uk/*
Tools for Predictive Learning Analytics

- Blackboard – Blackboard Predict
- Desire2Learn – BrightSpace – Performance Plus
- Canvas – Course Analytics/Student Analytics – NOT PREDICTIVE
- Moodle – X-Ray Learning Analytics
- B&N Education – LoudSight
- OU Analyse (Open University, UK)
Are these tools effective/accurate?

- Depends on data input and predictive modeling

<table>
<thead>
<tr>
<th>Data Sources</th>
<th>LMS</th>
<th>LMS</th>
<th>SIS</th>
<th>LMS</th>
<th>SIS</th>
<th>GPA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prediction</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
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- Prediction improves over the course of a semester
Issues with current predictive models

- Rely heavily on LMS usage

- More data-driven than theory-driven
  - Call for theory-driven learning analytics (Gašević et al., 2015; Rogers et al., 2016)

- One size does not fit all (Gašević et al., 2016, Conjin et al., 2017)

- Learning design and instructional conditions should be taken into consideration (Bakharia et al, 2016; Gašević et al., 2015; Gašević et al., 2016; Lockyer et al., 2013)
Two examples of Q&A feature use

- 300-level Journalism course (face-to-face)
  - N=29
  - Instructor has shared highlights and notes
  - "Question" use is required and graded (5% of the final grade)

- 100-level Psychology course (online)
  - N=150
  - Question/note use is optional and not graded
Imagine you own a health club and you want to attract people to sell memberships. You decide to offer a special deal based on the number of referrals you receive. How would you incentivize referring friends to bring in new members? Consider using a referral program where members can earn rewards for each successful referral they make.

Would you like to post this as a question?

Add to flashcards

Tags (comma separated)

How can operant conditioning produce complex behaviors?

B. F. Skinner shaping a dog named Agnes. In the span of 20 minutes, Skinner was able to use reinforcement of successive approximations to shape Agnes's behavior. The result was a pretty neat trick: to wander in, stand on hind legs, and jump.
<table>
<thead>
<tr>
<th>Subject</th>
<th>Text</th>
<th>Student’s Question</th>
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<tbody>
<tr>
<td><strong>Psychology 101</strong></td>
<td>“Taste and Smell Molecules dispersed in the air or dissolved in saliva reveal the identity of substances that we may or may not want to eat.”</td>
<td>“The smell of something burning reminds you that you forgot to set the timer on the stove. What has happened? Transduction”</td>
</tr>
<tr>
<td><strong>Journalism 300</strong></td>
<td>“listeners, ‘You are fit for something better than slavery and cannon fodder.’ In court, Debs said he abhorred war, and the jury used this statement as evidence that there was both intent and likelihood that his speech would harm the war effort.”</td>
<td>“Here is my issue...was he threatening national security or the war effort? as much as they should go hand in hand, they often do not.”</td>
</tr>
</tbody>
</table>
Page View Comparison

Psychology Weekly Page Views by Grade

Journalism Weekly Page Views

Grade
- A
- B
- C
- D
- FIW
Question Comparisons

Psychology Student Weekly Questions by Grade

Journalism Weekly Questions by Grade

Grade
A
B
C
D
Instructor Answers

- Psychology 101
- Did not use feature

- Journalism 300

Journalism Instructor Weekly Answers

![Graph showing weekly answers for Journalism 300]
What We’re Missing

- Course context
  - Delivery format
  - Discipline

- Instructional Context
  - Pedagogical justification
    - Course syllabus
    - First-hand information from instructor

- Data from other DLEs (if available)
  - E-text usage
  - Access to instructional videos

- Student internal factors
  (most difficult to get)
  - Motivation
  - Self-regulation
References


