Learning Analytics
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Overview

» Context
» Drivers
» Definitions
» Trends
» Impact and benefits
» Risks
» Discussion
Analytics: the bigger picture

» Growing trend
» New opportunities
» Big Data
» Business Intelligence (BI)
» Learning analytics – where does it fit?
Learning analytics - a growing trend

The number 100 represents the peak search volume

Source: Google 2012
What is learning analytics?

» Focus on student learning
» Provides actionable insights into the learning process
» Support and development ethos
» Combining static, dynamic and real-time data
» Types of data: demographic, online activity, log-ins, discussions, assessment data, geo-location etc
» Stakeholders: governments, institutions, teachers and learners

“Learning analytics is the measurement, collection, analysis and reporting of data about learners and their contexts, for purposes of understanding and optimising learning and the environments in which it occurs.” (LAK, 2011)
## Educational analytics

<table>
<thead>
<tr>
<th>TYPE OF ANALYTICS</th>
<th>LEVEL OR OBJECT OF ANALYSIS</th>
<th>WHO BENEFITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learning Analytics</td>
<td><strong>Course-level</strong>: social networks, conceptual development, discourse analysis, “intelligent curriculum”</td>
<td>Learners, faculty</td>
</tr>
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<td></td>
<td><strong>Departmental</strong>: predictive modeling, patterns of success/failure</td>
<td>Learners, faculty</td>
</tr>
<tr>
<td>Academic Analytics</td>
<td><strong>Institutional</strong>: learner profiles, performance of academics, knowledge flow</td>
<td>Administrators, funders, marketing</td>
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<td><strong>Regional</strong> (state/provincial): comparisons between systems</td>
<td>Funders, administrators</td>
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<td><strong>National and International</strong></td>
<td>National governments, education authorities</td>
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</tbody>
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Learning analytics trends

- Adaptive learning analytics
- Social learning analytics
- Predictive analytics
- Assessment analytics
- Student dashboards
Student Dashboards

University of Hertfordshire Student Progress Dashboard
Assessment analytics: Engaging students

» Using e-submission software
» Module cohort: English
» Power of showing data to students – feedback on essay assignment
» Student-facing workshops
» Engaging with data – emotional experience
» Dashboards – emotionally deficient?

Source: University of Huddersfield
Predictive analytics: CourseSignals

» Analyses individual student performance
» Aims to reduce risk of poor performance and increase academic success
» Traffic light colour coding
» 10% increase in As & Bs, 6.41% decrease in Ds, Fs and withdrawals
» Improved retention
» Positive student feedback
Social learning analytics

» Social learning theory
» Social network analysis (SNA)
» Discourse analytics
» Focus on social interactions and impact on/indicators of performance
» Learning dialogue and dispositions analytics
» Open University: SocialLearn

Figure 5: Mock-up of SocialLearn dashboard for an individual learner

Ferguson & Buckingham Shum, 2012
Adaptive learning analytics

» Cognitive modelling
» Interactive, real-time
» Personalised curricula
» Adaptive presentation of content
» Intelligent tutoring systems
» Resource intensive to build
» Carnegie Mellon Open Learning Initiative
Impact of learning analytics

Macro
Region/state/national/international

Meso
Institution

Micro
Individual

Finer-grained data enriches meso and macro level data

Breadth and depth from macro + meso level data adds power to micro analytics

Adapted from: Buckingham Shum 2012
Benefits

• Identify at-risk learners and provide interventions
• Provide learners with insight into their own learning habits and give recommendations for improvement

Individual

• Improve decision-making and organisational resource allocation
• Tailor course offerings and methods of delivery
• Evaluate teaching performance and support academic development

Institutional

• Transform the college/university system, as well as academic models and pedagogical approaches

Sector

Adapted from: Buckingham Shum 2012
Risks

» Leadership v managerialism
» Capacity/skills and data literacy of users
» Data quality, technology
» Data v expertise
» Ineffectual/inappropriate interventions
» Big brother approach – ethics
» Delayed adoption leads to missed opportunities

Adapted from Van Harmelen and Workman, 2012
Factors for successful adoption

“Any wise institution will examine where it wishes to move to pedagogically, and consider if any proposed learning analytics solution will hinder or enhance its pedagogic development.”

(Harmelen & Workman 2012)
Discussion

» What are the potential benefits of learning analytics for your learners and your university?
» What are the key challenges and issues?
» What will enable you to develop learning analytics?
Resources

» CETIS Analytics Series 
  http://publications.cetis.ac.uk/c/analytics

» Jisc infoNet Business Intelligence infoKit 
  www.jiscinfonet.ac.uk/infokits/business-intelligence

» EDUCAUSE resources 
  www.educause.edu/library/learning-analytics

» SoLAR - Society for Learning Analytics and Research 
  www.solaresearch.org
References


» Google (2012) http://www.google.com/trends/explore#q=learning%20analytics%2C%20academic%20analytics%2C%20educational%20data%20mining

