LEARNING ANALYTICS: DREAM OR NIGHTMARE?

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OVERVIEW

- Let me tell you a story…
- SciTech Studies 101
  - Data and Analytics are not neutral: someone defines them, and someone interprets them
- Educators and researchers concerns
  - The most important kinds of learning can’t be quantified
  - This is my new performance indicator?
- Learning Analytics?
  - Beyond BusinessAnalytics.edu?
- Why are social learning analytics significant?
  - Strategically important learning for C21
  - Informal+formal learners in control
LEARNING ANALYTICS IN ENGLISH SCHOOLS

Contextual Value Added Key Stage 1 to 2: by subject
Analysis in this section focuses on the contextual value added for the National Curriculum core subjects (English, mathematics and science) in the current year. For all of the subject-based CVA analysis, prior attainment used in the CVA models was based on a combination of reading, writing and mathematics at Key Stage 1. A 95% confidence interval is shown. Where the confidence interval does not cross the national average line the school value differs significantly from that national average.

Chart 2.1.12

Chart 2.1.13

<table>
<thead>
<tr>
<th>Subject</th>
<th>Cohort for CVA</th>
<th>CVA School score</th>
<th>95% confidence interval +/-</th>
<th>Significance</th>
<th>Percentile rank</th>
<th>Coverage</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>English</strong></td>
<td>72</td>
<td>97.4</td>
<td>0.5</td>
<td>Sig-</td>
<td>100</td>
<td>94%</td>
</tr>
<tr>
<td></td>
<td>76</td>
<td>98.9</td>
<td>0.5</td>
<td>Sig-</td>
<td>87</td>
<td>94%</td>
</tr>
<tr>
<td></td>
<td>64</td>
<td>100.6</td>
<td>0.5</td>
<td>Sig+</td>
<td>24</td>
<td>96%</td>
</tr>
<tr>
<td><strong>Mathematics</strong></td>
<td>71</td>
<td>98.4</td>
<td>0.6</td>
<td>Sig-</td>
<td>93</td>
<td>92%</td>
</tr>
<tr>
<td></td>
<td>76</td>
<td>98.6</td>
<td>0.6</td>
<td>Sig-</td>
<td>91</td>
<td>94%</td>
</tr>
<tr>
<td></td>
<td>64</td>
<td>99.6</td>
<td>0.6</td>
<td>Sig+</td>
<td>62</td>
<td>96%</td>
</tr>
</tbody>
</table>
LEARNING ANALYTICS IN ENGLISH SCHOOLS

Chart 2.1.22
For 2007 results, Mathematics (KS2)

The chart shows the proportion of pupils achieving level 4 or above in Key Stage 2 Mathematics (KS2) and for those who did not reach this threshold how they have progressed since Key Stage 1.

Key
- 54 pupils achieved Level 4 or above in 2007
- 8 pupils were at Level 3 of which:
  - 0 Stuck
  - 1 Falling Behind
  - 5 Slow Moving
  - 0 Making Good Progress
- 2 A, D or had no prior attainment data at KS1
- 5 at Level 2 or below
- 0 Absent

EDUCAUSE LEARNING INITIATIVE
WILL OUR ANALYTICS REFLECT THE PROGRESS THAT ‘JOE’ HAS MADE ON SO MANY OTHER FRONTS – BUT NOT HIS SATS?
reactions to Learning Analytics in image and story

Choose an image and email it to the site with your story...
MEASUREMENT TOOLS ARE NOT NEUTRAL

‘accounting tools...do not simply aid the measurement of economic activity, they shape the reality they measure’

COMPUTING THE UNCOMPUTABLE?

- The dangers of computational reductionism for learning analytics
- Gardner Campbell, LAK12 MOOC webinar
  - http://lak12.wikispaces.com/Recordings

Four Strong Cautions

- “Student Success”
- Complexity
- Points of “Intervention”
- The “Third Wave”

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“Here I Stand,” Erica Goldson, June 25, 2010

BEYOND BIG DATA HUBRIS

1. Automating Research Changes the Definition of Knowledge
2. Claims to Objectivity and Accuracy are Misleading
3. Bigger Data are Not Always Better Data
4. Not All Data Are Equivalent
5. Just Because it is Accessible Doesn’t Make it Ethical

ANALYTICS PROVIDE MAPS = SYSTEMATIC WAYS OF DISTORTING REALITY

“A marker of the health of the learning analytics field will be the quality of debate around what the technology renders visible and leaves invisible.”

DEAR STUDENT: HERE ARE YOUR NEW PERFORMANCE INDICATORS…
DEAR STUDENT: HERE ARE YOUR NEW PERFORMANCE INDICATORS…

DEAR COLLEAGUE: HERE ARE YOUR NEW PERFORMANCE INDICATORS…
DEAR STUDENT: HERE ARE YOUR NEW PERFORMANCE INDICATORS…

DEAR COLLEAGUE: HERE ARE YOUR NEW PERFORMANCE INDICATORS…

DEAR UNIVERSITY: HERE ARE YOUR NEW PERFORMANCE INDICATORS…
assuming we want to move beyond fight or flight, what are the smart questions we should be asking?
BusinessAnalytics.edu
or
LearningAnalytics.com
?
BusinessAnalytics.edu and LearningAnalytics.com?
LEARNING ANALYTICS?

“theory-based analytics”
LEARNING ANALYTICS?

Premise: ANY analytic is an implicit theory of the world, in that it is a model, selecting specific data and claiming it as an adequate proxy for something more complex

“theory-based analytics”
So for “Theory”, let’s include assumptions, as well as evidence-based findings, statistical models, instructional methods, as well as more academic “theories”

“theory-based analytics”

The question is whether this has INTEGRITY as a meaningful indicator, and WHO/WHAT ACTS on this data
A theory might tell you WHAT to attend to as significant/interesting system behaviour.

“theory-based analytics”

The analytics task is to meaningfully MINE from data, or ELICIT from learners, potential indicators in a computationally tractable form.
Learning Analytics?

A mature theory will tell you WHY a given pattern is significant system behaviour.

“theory-based analytics”

This might help in guiding how to meaningfully, ethically present analytics to different stakeholders, aware of how they might react to them.
LEARNING ANALYTICS?

A mature theory validated by pedagogical practices will tell you APPROPRIATE INTERVENTIONS to take given particular learner patterns

“theory-based analytics”

If formalizable, analytics might then be coupled with recommendation engines or adaptive system behaviours
A theory can shed new light on familiar data

“theory-based analytics”

This might equate to reinterpreting business analytics through a learning lens
A theory might also predict future patterns based on a causal model.

"theory-based analytics"

This might be formalizable as a predictive statistical model, or an algorithm in a rec-engine.
ANALYTICS FOR...
C21 SKILLS?
LEARNING HOW TO LEARN?
SCHOLARSHIP?

social capital critical questioning argumentation citizenship habits of mind resilience collaboration creativity metacognition identity readiness sensemaking engagement motivation emotional intelligence
ANALYTICS THAT EQUIP FOR MANAGING COMPLEXITY AND LIFELONG, LIFEWIDE LEARNING?

“The test of successful education is not the amount of knowledge that pupils take away from school, but their appetite to know and their capacity to learn.”

Sir Richard Livingstone, 1941
ANALYTICS THAT EQUIP FOR MANAGING COMPLEXITY AND LIFELONG, LIFEWIDE LEARNING?

“We are preparing students for jobs that do not exist yet, that will use technologies that have not been invented yet, in order to solve problems that are not even problems yet.”

“Shift Happens”
http://shifthappens.wikispaces.com
THINK ABOUT THE BEST LEARNERS YOU’VE KNOWN...

- Not necessarily the highest grade scorers — but the ones who loved learning, made really good progress, and did well after their studies.

What qualities come to mind?
THINK ABOUT THE BEST LEARNERS YOU’VE KNOWN…

- Not necessarily the highest grade scorers — but the ones who loved learning, made really good progress, and did well after their studies.

What qualities come to mind?

Type them in the text chat window…
VISUAL ANALYTIC REFLECTING BACK TO LEARNERS HOW THEY SEE THEMSELVES

The Learning Warehouse ELLI Profile <learner identifier>

Learning dispositions can be modelled as a 7-dimensional construct, validated in numerous ways

Bristol and Open University are now embedding this in learning analytics

ENQUIRYBLOGGER: COHORT DASHBOARD

Analytics for learning conversations
KMI’S COHERE:
A WEB DELIBERATION PLATFORM ENABLING SEMANTIC SOCIAL NETWORK AND DISCOURSE NETWORK ANALYTICS

Rebecca is playing the role of broker, connecting different peers’ contributions in meaningful ways.

AN AGENT REPORTS A CONNECTION OF INTEREST

Elluminate sessions can be very long – lasting for hours or even covering days of a conference. It would be useful if we could identify where quality learning conversations seem to be taking place, so we can recommend those sessions, and not have to sit through online chat about virtual biscuits.

The primary goal of this project was to conduct an exploratory research study to determine if providing a professional development program using open education resources (OER) would help teachers begin to transform their curriculum and teaching through the use of technology. Our eight-year Maine Learning Technology Initiative (MLTI) experience had shown us that while providing laptops to all middle school teachers and students has had many positive impacts on schools, classrooms, and learning, many mathematics teachers still had not fully integrated the laptop technology into their teaching. Accordingly, this research study was designed to determine the impacts of helping a group of middle school and high school mathematics teachers, through professional development with mathematics OER, to teach targeted algebra topics using technology.

Several key activities were undertaken in this project over an 18-month time period. First, we attempted to conduct a needs assessment to determine the challenges teachers encounter in using OER. Although the use of OER has grown quite extensively in higher education and K-12 settings in developing countries, OER use by K-12 teachers in the United States appears to be limited. The purpose of this activity was to explore why this was the case, to identify challenges teachers encounter in using OER, and to develop strategies for overcoming these challenges through our professional development program and research. The environmental scan consisted of several activities, including interviews with leading OER experts and proponents, survey of teachers, and a limited number of focus groups. Through these activities we began to draw conclusions about the use of OER in K-12 school settings, and these conclusions are discussed below under Lessons Learned.

SUMMARY

Who gets to hold the magnifying glass?
Learning Analytics should provide mirrors for learners to become more reflective, and less dependent