Moving beyond a fashion: Likely paths and pitfalls for learning analytics

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Colin Beer (CQU)

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Overview

Background & Rationale

Fashion & Fads

Paths & Pitfalls

Wrap up

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Who are CDDU?

- 2 copy editors
- 6 desktop publishers
- 1 multimedia designer
- 2 e-learning support staff
- 2 and a bit curriculum designers
Started in 2008

INDICATORS project

http://indicatorsproject.wordpress.com

(Beer, Clark, & Jones, 2010; Beer, Jones, & Clark, 2012, 2009; Clark, Beer, & Jones, 2010)
(Johnson, Smith, Levine, & Haywood, 2010)

2010 Oz&NZ Horizon Outlook
No mention of analytics

One year or less

2012 Oz Horizon Outlook

(Johnson, Adams, & Cummins, 2012)

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Find our claim
may help moderate the adoption of a new IS innovation and replace the sudden and short-lived bursts of interest with a more enduring application of the innovation

(Hirschheim, Murungi & Pena, 2012, p. 76)
Learning Analytics
How universities will implement analytics
Who are CDDU?

2 copy editors
9 desktop publishers
1 multimedia designer
2 e-learning support staff
2 and a bit curriculum designers
The Hype Cycle
(according to Gartner)

- Peak of inflated expectations
- Technology trigger
- Slope of enlightenment
- Through of disillusionment
- Plateau of productivity

Visibility vs. Time

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the Hype Cycle
(according to Gartner)

- Peak of inflated expectations
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- Through of disillusionment
Fad cycle

1. Technological spark
2. Growing revolution
3. Minimal impact
4. Resolution of dissonance

(Birnbaum, 2000)
Management fashion is "relatively transitory collective beliefs, disseminated by the discourse of knowledge entrepreneurs, that a management technique is at the forefront of rational management progress”

(Abrahamson and Fairchild, 2003)

Amplified by hyperbole..., the fashionable vision may exert a strong, if transitory, normative pull among managers.

(Swanson and Ramiller, 2004)
A rationale in favor of adopting will be context-specific, rich in its consideration of local organizational facts, and focused on the innovation’s potential contribution to the firm’s distinctive competence.

(Swanson and Ramiller, 2004)
Paths through the swamp

http://www.flickr.com/photos/mikelove/2526016742/
may help moderate the adoption of a new IS innovation and replace the sudden and short-lived bursts of interest with a more enduring application of the innovation

(Hirschheim, Murungi & Pena, 2012, p. 76)
the measurement, collection, analysis and reporting of data about learners and their contexts, for purposes of **understanding and optimizing** learning and the environments in which it occurs

http://www.solaresearch.org/mission/about/

**Change** the game of education

(Essa, 2012)

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Model of university teaching

(Trigwell, 2001)

- Teaching/Learning Context
- Teachers’ Thinking
- Teachers’ Planning
- Teachers’ Strategies
- Student

http://www.flickr.com/photos/dnorman/177883109/
1. Do it to

2. Do it for academics and students

3. Do it with

Paths through the swamp

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http://www.flickr.com/photos/mikelove/2526016742/
1. Do it to define the path
2. Do it for academics and students
3. Do it with academics and students

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MANAGING FROM THE DARK SIDE
Model of university teaching

(Trigwell, 2001)

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Pitfalls

Complex and likely to fail
Failures of rationality
Resistance
Compliance
Loss of information
Disappearing data
Tail wagging the dog

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Pitfalls
Complex and likely to fail

Data warehouses “have been around for quite some time, they have been plagued by high failure rates and limited spread or use

(Ramamurthy, Sen and Sinha, 2008, p. 976)
Pitfalls

Complex and likely to fail

it also triggers significant conceptual and practical discontinuities within adopting organizations, imposes a heavy knowledge burden, creates enterprise-wide dependencies, and triggers considerable political consequences.

(Ramamurthy, Sen and Sinha, 2008, p. 979)
the vast majority of big data and magical business analytics projects fail. Not in a great big system-won’t-work way… They fail because the users don’t use them.

(Schiller, 2012)
Fad cycle

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(Birnbaum, 2000)
Fad cycle

1. Technological spark
2. Growing revolution
3. Minimal impact
4. Resolution of dissonance

Next sector

(Birnbaum, 2000)

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Pitfalls

Complex and likely to fail

made little use of the intelligence revealed by the analytics process

(MacFadyen & Dawson, 2012, p. 49)
Pitfalls

Complex and likely to fail

Data warehouse development is dominated by central IT departments that have little experience with decision support. A common theme in industry conferences and professional books is the rediscovery of fundamental DSS principles like evolutionary development (Arnot & Pervan, 2005).

3. Do it with
Pitfalls

Failures of rationality

Data-driven decision making does not guarantee effective decision making. Having data does not necessarily mean that they will be used to drive decisions or lead to improvements.

(Marsh, Pane & Hamilton, 2006, p. 10)
Pitfalls

Failures of rationality

1. National standardised testing

Data-driven decision making does not guarantee effective decision making. Having data does not necessarily mean that they will be used to drive decisions or lead to improvements.

(Marsh, Pane & Hamilton, 2006, p. 10)

http://flickr.com/photos/tonymangan/754511201/
People aren’t rational

Reliance on intuition, instincts and simply heuristics
(Jamieson & Hyland, 2006)

Systematic biases influence judgment
(Tversky and Kahneman, 1974)

Inherent limits in organisational substantive rationality
(Cecez-Kecmanovic, et al, 2002)

FOMO

Bounded rationality
(Simon, 1991)

37 cognitive biases
(Arnott, 2006)

Innovation and change within universities can never be mere rational processes
(Jones and O’Shea, 2004)

http://www.flickr.com/photos/seatbelt67/50225527
There is, of course, a long tradition of research that highlights the many ways workers resist managerial control (Fleming and Spicer, 2003).

- **sabotage** (Mars, 1982)
- **careful carelessness** (Prasad and Prasad, 1998)
- **hidden transcripts** (Scott, 1985)
- **indirect resistance** (Ong, 1987)
- **subjective resistance** (Kondo, 1990)
Working to rule (Findlow, 2008)
Camouflage, conformance (Snowden, 2002)
Task corruption (White, 2006)
Workarounds (Pollock, 2005)
Amputation
Reinvention (Rogers, 1995)
Simulation
Shadow systems (Shaw, 1997)
39%
61%
I go in and tick all the boxes, the moderator goes in and ticks all the boxes and the school secretary does the same thing. It's just like the exam check list. (Jones, 2012)
MT @catspyjamasnz: Students “faked” collaboration in Bb, 'cause it was requirement #ascilite2012 <learning analytics will be full of fakery!
FAILURE
we all fail, some more often than others

http://www.flickr.com/photos/tinou/96393863/
1. Investigate the causes
2. Research literature to identify best practice
3. Undertake a redesign informed by best practice
4. Evaluate the redesign, reflect and make more changes

Hypothetical

FAI L U R E
we all fail, some more often than others

http://www.flickr.com/photos/tinou/96393863/
change the assessment to satisfy the institutional requirements of satisfied students and reasonable pass rates rather than explore an alternative learning and teaching approach.
change the assessment to satisfy the institutional requirements of satisfied students and reasonable pass rates rather than explore an alternative learning and teaching approach an effective solution in the current higher education environment that encourages the academic to prioritise other areas, such as research.

(Tutty, Sheard et al, 2008)
Without the availability of high-quality data … data may become misinformation or lead to invalid inferences.

(Marsh, Pane & Hamilton, 2006, p. 3)
Pitfalls

Loss of information
Pitfalls

...the nature of learning analytics and its reliance on abstracting patterns or relationships from data has a tendency to hide the complexity of reality

(Campbell, 2012)
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Pitfalls

Disappearing data

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Tail wagging the dog

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Teaching/Learning Context

Teachers’ Thinking

Teachers’ Planning

Teachers’ Strategies

Student

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Pitfalls

The chasm

It’s not what they do?

Constraints

We don’t know how?
Pitfalls

The chasm

(Geoghegan, 1994)

The Technology Adoption Lifecycle

Innovators
Early Adopters
Early Majority
Late Majority
Laggards

"The Chasm"

Area under the curve represents number of customers

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Pitfalls

1. Ignorance of the gap
2. The technologists alliance
3. Alienation of the mainstream
4. Alienation of the mainstream

The chasm

Geoghegan, 1994

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Pitfalls

The chasm

1. Ignorance of the gap
   - Homogeneity

2. The technologists alliance
   - Early adopters
   - IT Staff
   - Vendors

3. Alienation of the mainstream

4. Alienation of the mainstream

(Convery, 2009, p. 25)

These rhetorical claims espousing technology appealed to readers’ ‘vision’ and consistently emphasised innovation at the expense of reflection on teachers’ thinking and practices.
## Pitfalls

### The Chasm

<table>
<thead>
<tr>
<th>Early adopters</th>
<th>Early majority</th>
</tr>
</thead>
<tbody>
<tr>
<td>Like radical change</td>
<td>Like gradual change</td>
</tr>
<tr>
<td>Visionary</td>
<td>Pragmatic</td>
</tr>
<tr>
<td>Project oriented</td>
<td>Process oriented</td>
</tr>
<tr>
<td>Risk takers</td>
<td>Risk averse</td>
</tr>
<tr>
<td>Willing to experiment</td>
<td>Need proven uses</td>
</tr>
<tr>
<td>Self sufficient</td>
<td>Need support</td>
</tr>
<tr>
<td>Relate horizontally (interdisciplinary)</td>
<td>Relate vertically (within discipline)</td>
</tr>
</tbody>
</table>

(From: Geoghegan, 1994)

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**Innovators**

1. Ignorance of the gap

2. The technologists alliance

3. Alienation of the mainstream

4. Alienation of the mainstream

---

**Early adopters**

- Like radical change
- Visionary
- Project oriented
- Risk takers
- Willing to experiment
- Self sufficient
- Relate horizontally (interdisciplinary)

**Early majority**

- Like gradual change
- Pragmatic
- Process oriented
- Risk averse
- Need proven uses
- Need support
- Relate vertically (within discipline)

---

"The Chasm" is the gap between early adopters and the early majority of customers. Under the curve represents a larger number of customers.
Pitfalls

It’s not what they do?

Usually don’t develop new courses or overhaul existing (Stark & Lowther, 2000)

Spend most time fine-tuning a course (Stark, 2000)
Pitfalls

Course Offering

Curriculum & Learning design

Opinion

Results

Satisfaction

Based on (Lodge & Lewis, 2012)
teachers often receive dual messages from district leaders to follow mandated curriculum pacing schedules and to use data to inform their practice.

Without the discretion to veer from district policies such as pacing schedules, teachers will be limited in their ability to respond to data, particularly when analyses reveal problem areas that require time for re-teaching or remediation.

(Marsh, Pane, & Hamilton, 2006, p. 11)
“why are you still running 3 assignments when you should only run 2”

(Tutty, Sheard & Avram, 2008, pp. 181-182)
Pitfalls

dearth of studies examining the use and impact of learning analytics to inform the design, delivery and future evaluations of individual teaching practices

(Dawson et al., 2011; Dawson, Heathcote, & Poole, 2010)

We don’t know how?
1. Do it to

2. Do it for academics and students

3. Do it with

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Model of university teaching

(Trigwell, 2001)

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Pitfalls

- Starvation
- Dealing with the complexity
- Inefficiency (perceived and actual)
- Changing the unchangeable
One approach

(Jones, 2012)

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