Analytics for Lifelong Learning Competencies: Aligning Pedagogy, Human-Centred Design & University Strategy

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Deep acknowledgements to the team whose joint work I’m sharing today…

https://cic.uts.edu.au/about/people
“Informatics concerns itself with the study of living, working and building in a digital world. Wherever technology touches people, it must be designed with ultimate care. This requires mastery of technological knowhow and a deep appreciation of the social, cultural and organizational forces at work.”

https://www.informatics.uci.edu/explore/chairs-welcome
Balancing and aligning the elements

Learning Analytics
User Experience
Learning Analytics + Learning Design
Learning Analytics Co-design
Organisational Strategy
the machines are coming…
cognitive automation

implications for learning analytics
+ some examples

UTS learning strategy, supported by
analytics innovation + impact
San Francisco, Fall Joint Computer Conference — Dec. 9th 1968

Monday afternoon
December 9
3:45 p.m. / arena
Chairman:
DR. D. C. ENGBART
Stanford Research Institute
Menlo Park, California

A research center
for augmenting human intellect

This session is entirely devoted to a presentation by Dr. Engelbart on a computer-based, interactive, multiconsole display system which is being developed at Stanford Research Institute under the sponsorship of ARPA, NASA and RADC. The system is being used as an experimental laboratory for investigating principles by which interactive computer aids can augment intellectual capability. The techniques which are being described will, themselves, be used to augment the presentation. The session will use an on-line, closed circuit television hook-up to the SRI computing system in Menlo Park. Following the presentation remote terminals to the system, in operation, may be viewed during the remainder of the conference in a special room set aside for that purpose.
dougengelbart.org
we need better tools to tackle “humanity’s complex, urgent problems”
US change index of work tasks 1960-2009

Frank Levy and Richard J. Murnane. *Dancing with Robots: Human Skills for Computerized Work* (Washington, DC: Third Way, 2013), Fig.3
Routine manual and cognitive work is being automated

Only non-routine manual and cognitive work will be done by people

(What counts as ‘non-routine’ will reduce as AI improves)
The Probability of an Occupation’s Automation Varies Dramatically Across the Wage Spectrum

- **Probability of Automation by an Occupation’s Median Hourly Wage**

<table>
<thead>
<tr>
<th>Median Probability of Automation, Percent</th>
<th>Median Hourly Wage in 2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>Less than 20 Dollars</td>
</tr>
<tr>
<td>90</td>
<td>20 to 40 Dollars</td>
</tr>
<tr>
<td>80</td>
<td>More than 40 Dollars</td>
</tr>
</tbody>
</table>

- **Less than 20 Dollars**
  - Probability: 83%

- **20 to 40 Dollars**
  - Probability: 31%

- **More than 40 Dollars**
  - Probability: 4%


Jason Furman, Chairman of the Council of Economic Advisers

https://artificialintelligencenow.com/schedule/conference/presentation/time-different-opportunities-and-challenges-artifi
Initiatives 2019-21

- Learning for a lifetime
- Personal learning experience
- Digital partners in learning
- New ways of working
- Our precinct, community and partnerships
- Transforming society through connected research
- A distinctive international profile and student experience
- Delivering positive social change
Personal learning experience

Whether they’re a first-time student or have been here before, our students will co-create their own learning experiences.

We’ll create a learning experience that will be seamless, personalised and relevant. It will leverage our campus and industry connections to ensure education is enriched with leading technology.

➔ data-driven feedback personalised to students
what are the implications for learning analytics?
As analytics aggregate lower level data & A.I. gradually automates routine cognitive work...
Humans must move to the higher ground…

- Train data scientists to combine algorithmic intelligence with creative intelligence, and ethical mindsets
- Deploy all the Educational & Data Science expertise we have to cultivate the higher order graduate qualities

As analytics aggregate lower level data & A.I. gradually automates routine cognitive work…
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- Deploy all the Educational & Data Science expertise we have to cultivate the higher order graduate qualities

Cultivate those qualities that are distinctively human and devise practical, authentic ways to evidence them
The endless cycle…

What we take to be “distinctively human” has always been in transition, but now at unprecedented pace.

…the water keeps rising!
Towards analytics for a holistic higher education

Randy Bass
Georgetown University

Reinvent the University for the Whole Person
http://reinvent.net/series/reinvent-the-university
Future Work Skills 2020

While all six drivers are important in shaping the landscape in which each skill emerges, the color-coding and placement here indicate which drivers have particular relevance to the development of each of the skills.

**Extreme Longevity**
Increasing global lifespans change the nature of careers and learning

**Computational World**
Massive increases in sensors and processing power make the world a programmable system

**Superstructured Organizations**
Social technologies drive new forms of production and value creation

**NEW MEDIA ECOSYSYEM**
New communication tools require new media literacies beyond text

**Rise of Smart Machines and Systems**
Workplace robotics nudge human workers out of routine, repetitive tasks

**Globally Connected World**
Increased global interconnectivity puts diversity and adaptability at the center of organizational operations

KEY
Drivers—disruptive shifts that will reshape the workforce landscape
Key skill needed in the future workforce

Institute for the Future
http://www.iftf.org/futureworkskills
1 SENSE-MAKING

Definition: Ability to determine the deeper meaning or significance of what is being expressed.

2 SOCIAL INTELLIGENCE

Definition: Ability to connect to others in a deep and direct way, to sense and stimulate reactions and desired interactions.

3 NOVEL & ADAPTIVE THINKING

Definition: Proficiency at thinking and coming up with solutions and responses beyond that which is rote or rule-based.

4 CROSS-CULTURAL COMPETENCY

Definition: Ability to operate in different cultural settings.

5 COMPUTATIONAL THINKING

Definition: Ability to translate vast amounts of data into abstract concepts and to understand data-based reasoning.

6 NEW-MEDIA LITERACY

Definition: Ability to critically assess and develop content that uses new media forms, and to leverage these media for...

7 TRANSDISCIPLINARITY

Definition: Literacy in and ability to understand concepts across multiple disciplines.

8 DESIGN MINDSET

Definition: Ability to represent and develop tasks and work processes for desired outcomes.

9 COGNITIVE LOAD MANAGEMENT

Definition: Ability to discriminate and filter information for importance, and to understand how to maximize cognitive functioning using a variety of tools and techniques.

10 VIRTUAL COLLABORATION

Definition: Ability to work productively, drive engagement, and demonstrate presence as a member of a virtual team.

Institute for the Future
http://www.iftf.org/futureworkskills
what are the implications for learning analytics?
Framework @UTS for educators to co-design Analytics/AI → augment teaching practice

Instant feedback on collocated teamwork → nursing
High performance teamwork: nursing simulations
THE ANALYTICS CHALLENGE: Making multimodal streams meaningful

From multimodal logs to higher-order constructs:

Curriculum outcomes

1 Patient-centred care &
2 Teamwork

Assessment
THE ANALYTICS CHALLENGE:
Making multimodal streams meaningful

From multimodal logs to higher-order constructs:

Curriculum outcomes

Dimensions of collaborative activity

1 Patient-centred care & Teamwork

2

- Physical
- Epistemic
- Social
- Affective
THE ANALYTICS CHALLENGE: Making multimodal streams meaningful

From multimodal logs to higher-order constructs:

Curriculum outcomes

Dimensions of collaborative activity

1. Patient-centred care & Teamwork

- Physical:
  - Embodied strategies
  - Proximity to patient/objects
  - Intensity of physical activity

- Epistemic:
  - Actions and procedures

- Social:
  - Communication with patient
  - Teamwork communication

- Affective:
  - Changes in emotional arousal

Multimodal data sources

Higher-order constructs

Patient-centred care & Teamwork
THE ANALYTICS CHALLENGE: Making multimodal streams meaningful

From multimodal logs to higher-order constructs:

Curriculum outcomes

Dimensions of collaborative activity

Multimodal data sources

1. Patient-centred care & Teamwork

- Physical
  - Embodied strategies
  - Proximity to patient/objects
  - Intensity of physical activity

- Epistemic
  - Actions and procedures

- Social
  - Communication with patient
  - Teamwork communication

- Affective
  - Changes in emotional arousal

- Presence in meaningful zones
- Distance to the patient and the trolley
- Wrist acceleration intensity
- Actions registered by the manikin
- Critical procedures
- Interactions with objects
- # and length of utterances by the patient
- # and length of utterances by nurses
- Electrodermal activity peaks

Student Task Design

Assessment

Features in the Data
Personalised feedback on high performance teamwork

Who did what, when in a nursing simulation? Team Timeline for evidence-based debriefings

Personalised feedback on high performance teamwork

https://cic.uts.edu.au/personalised-feedback-to-nursing-teams
Student reaction to automated feedback on teamwork

"This tool helped me have quantitative data to reflect on. I can actively look back and see my exact actions, not just other perceptions of it"

“…while RN4 and RN2 were doing the fluids I was staying with the patient. It is good to step back and look at what each person was doing, one thing at the same time, I think it shows you how you worked as a team”

Educator reaction to automated feedback on teamwork

“I think it would be really helpful for students … if you gave them really structured reflection questions … and asked them to reflect on what they were doing — whether it was accurate or not, how they’re engaging with the patient and other team members, what they were thinking and feeling at the time — it would be a really valuable tool for deep reflection.”

Instant feedback on academic writing

→ personal, experiential, reflective
Automated feedback on reflective writing

- Reflection is critical to the integration of academic + experiential knowledge.
- This is where you disclose what you’re uncertain about, and how you’ve changed, in the first person.
- Scholarship clarifies the hallmarks of deeper reflective writing:

  Important aspects of reflective writing:

  - Initial thoughts and feelings about a significant experience.
  - The challenge of new surprising or unfamiliar ideas, problems or learning experiences.
  - How new knowledge can lead to change.

Educator: AcaWriter supports professional reflection by Pharmacy students following work placements

Dr Cherie Lucas
Lecturer
UTS School of Pharmacy

https://cic.uts.edu.au/immediate-personalised-feedback-on-reflective-writing
Writing Context – Postgrad. Pharmacist reflection

Assessment Rubric

<table>
<thead>
<tr>
<th>Reflective Rubric 1</th>
<th>Categories of reflection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage 1: Returning to experience</td>
<td>Non-Reflector (0 Marks)</td>
</tr>
<tr>
<td>Statement does not provide a clear description of the learning event itself</td>
<td>Statement provides a description of the learning event</td>
</tr>
<tr>
<td>Stage 2: Attending to feelings</td>
<td>Statement provides little or no evidence of personal feelings, thoughts</td>
</tr>
<tr>
<td>Stage 3: Association: relates new knowledge with previous knowledge</td>
<td>Statement does not provide any links between new knowledge and previous knowledge</td>
</tr>
<tr>
<td>Stage 4: Integration</td>
<td>Statement shows no evidence of integration of prior knowledge, feelings or attitudes; with new knowledge, feelings or attitudes, thus not writing at new perspectives</td>
</tr>
</tbody>
</table>
| Stage 5: Validation: 
("Internal consistency") self assessing our beliefs, approaches, assumptions | Statement shows no evidence of self-reflection and self-assessing our previously held beliefs, assumptions, approaches, and occasionally relates it to previous experience and | Statement demonstrates self-reflection and self-assessment of previously held beliefs, assumptions, approaches, and occasionally relates it to previous experience and | |
| Stage 6: Appropriation: Interpreting the knowledge gained in the learning event | Statement of new knowledge gained in the learning event | |

Important aspects of reflective writing:

- Initial thoughts and feelings about a significant experience.
- The challenge of new surprising or unfamiliar ideas, problems or learning experiences.
- How new knowledge can lead to change

**Bold:** Deeper reflection, personally applied.

**Plain:** Expressions indicating belief, learning, or knowledge.

**Dotted:** Expressions indicating self critique.

**Dashed:** Words associated with strong feelings.
It is hard to believe that I started placement almost three months ago. It has definitely been full of challenging experiences which have shaped my understanding of the role of a pharmacist. During my time at Pharmacy I was able to observe different sides of pharmacy including pharmacist-patient interactions, retail, administration and the clinical aspects. To be honest my first thoughts going into placement were negative. I dreaded the idea of having to interact with patients as well as engaging with employees of the pharmacy. I felt that my lack of experience would cause an inconvenience and I would leave a negative impression in front of the pharmacist and other employees. However, I came to realise that my preceptor is an exceptional teacher and as the weeks progressed I begun to look up to him as a mentor. Despite my lack of experience my preceptor ensured I observed different counselling situations and even encouraged me to engage directly with patients from the early days of placement. By allowing me to engage with patients I have been able to build on important communication skills. My preceptor would also observe my weaknesses and bring them to my attention so that each week we would work on overcoming my weaknesses and turning them into strengths.
AcaWriter feedback tuned for Pharmacy reflection

It appears that you’ve acknowledged your first thoughts, feelings and/or reactions to an incident, or learning task, within the first paragraph.

Well done, it appears that you’ve reflected on how you would change/prepare for the future. Is there anything further to say about these new insights that have led to change.

While it appears that you’ve reported on how you would change/prepare for the future, you don’t seem to have reported first on what you found challenging. Perhaps you’ve reflected only on the positive aspects in your report?
Maintaining learner agency in response to AI

The rhetorical moves highlighted by AcaWriter are used in good academic writing but use them with caution according to the context. Remember, AcaWriter does not really understand your writing, the way people do. You may have written beautifully crafted nonsense - that's for you to decide! Moreover, writing is complex, and AcaWriter will get it wrong sometimes. If you think it got it wrong, that's fine - now you're thinking about more than spelling, grammar, and plagiarism.
Instant feedback on academic writing

→ persuasive, argumentative
A hallmark of academic writing is that it works with ideas.

Such writing typically displays specific “rhetorical moves” — a clear signal to the reader what the sentence’s purpose is in the persuasive narrative, e.g.

**Contrast**

“However, a recognized challenge is…”
“Despite repeated efforts…”
“Although it was predicted that…”
Signalling to readers that we’re “working with ideas”
Archetypal rhetorical moves made in academic writing

<table>
<thead>
<tr>
<th>Move</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Background</strong></td>
<td>While data was previously studied in educational research, analytics now enables more… Recent studies indicate that the effects of the drug could be permanent.</td>
</tr>
<tr>
<td><strong>Summary</strong></td>
<td>This paper will examine the question of how we develop scalable learning analytics applications</td>
</tr>
<tr>
<td><strong>Contrast</strong></td>
<td>However, a recognized challenge in the field of learning analytics is the uncertainty around LA’s pedagogical relevance</td>
</tr>
<tr>
<td><strong>Question</strong></td>
<td>Little research exists on how automated feedback impacts student writing.</td>
</tr>
</tbody>
</table>
Signalling to readers that we’re “working with ideas”
Archetypal rhetorical moves made in academic writing

<table>
<thead>
<tr>
<th>Move</th>
<th>Examples</th>
</tr>
</thead>
</table>
| Emphasis | The **key elements** for this approach are...  
It is important to note that the policy applies to all universities. |
| Novelty | This new model suggests a view of learning that is an embodied and relational process |
| Surprise | Surprisingly, the results indicate a weak link between customer satisfaction and brand value. |
| Trend   | With the growing quantity of data generated, **there is increasing interest in analytics** |
Educator: explains to her students why good lawyers know how to use rhetorical moves

“[rhetorical moves] indicate to the reader the writer’s attitude to the text. Why do we worry about that? Because as lawyers, our job is to […] argue that the way that we see the facts and the law favours a certain position or outcome.”
<table>
<thead>
<tr>
<th>Rubric Element</th>
<th>AcaWriter Tag</th>
<th>Example Sentence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engagement with law and scholarly literature</td>
<td>B Background</td>
<td>The Concept of good faith has previously been thought to be a work-in-progress in Australia</td>
</tr>
<tr>
<td>Statement of thesis/argument</td>
<td>S Summary</td>
<td>This article will trace the origins of good faith and its development in the common law.</td>
</tr>
<tr>
<td>Essay plan</td>
<td>S Summary</td>
<td>This essay contains three parts. The first part will talk about [...]</td>
</tr>
<tr>
<td>Critical analysis, evaluation, original insight</td>
<td>C Contrast</td>
<td>However, where the obligations are found in statute and they conflict with contractual obligations, it is important to note that the former must prevail.</td>
</tr>
<tr>
<td></td>
<td>E Emphasis</td>
<td></td>
</tr>
<tr>
<td>Drawing together themes and reaching logical conclusion</td>
<td>S Summary</td>
<td>In conclusion, the reasonable behavior required under the standard of good faith does not preclude strong bargaining techniques [...]</td>
</tr>
</tbody>
</table>
Feedback & User Interface

AcaWriter feedback tuned for Civil Law

NOTE: Computers don't understand writing like humans. So, AcaWriter may highlight rhetorically good sentences that actually make no sense, or leave un-highlighted a sentence that you feel is really good. It's fine to disagree with the feedback — but it's also your job to check your facts!

### Analytical Report
The analytical report highlights salient rhetorical moves AcaWriter identified in your essay for reflection. For more specific feedback, go to the Feedback tab.

### Rhetorical Moves

| B | Summarises or signals the authors goals |
| C | Contrast idea, tension or critical insight |
| O | Question or gap in previous knowledge |
| P | Perspective or stance |
| E | Emphasis to highlight key ideas |
| N | Novel improvements in ideas |
| R | Background information and previous work |
| S | Surprising or unexpected finding |
| T | Trend or tendency related to ideas |

Technology is an enabler in providing greater access to justice through its ability to connect people with legal needs to legal assistance, information, and advice. ♠ With the increasing popularity of internet-enabled hand held devices and laptop computers, there is a tendency to assume that even the socio-economically vulnerable in our society have access to technology and the skills to use online services with confidence. This is not necessarily the case.

Examples of the application of technology to provide legal information and assistance include case studies, guides and virtual legal advice clinics. ♠ The 2012 Review does not address the role of courts in serving the legal needs of the community. The court system is not regarded as a part of the wider legal assistance services. ♠ This omission questions the role of the court in facilitating access to its services, including dispute resolution and trials. It also identified uses of technology to expand the delivery of services, many of which are transferable to an online court. These services include e-access for remote communities, availability outside of business hours, interactive processes and virtual appearances. ♠ This essay will discuss uses of technology to expand the delivery of services, many of which are transferable to an online court.
AcaWriter feedback tuned for Civil Law

The rhetorical moves highlighted by AcaWriter are used in good academic writing but use them with caution according to the context. Remember, AcaWriter does not really understand your writing, the way people do. You may have written beautifully crafted nonsense - that's for you to decide! Moreover, writing is complex, and AcaWriter will get it wrong sometimes. If you think it got it wrong, that's fine - now you're thinking about more than spelling, grammar, and plagiarism.

It looks like you are missing a Summary move that highlights the purpose (thesis) statement of your essay and your essay plan. Try including linguistic cues to make this move clearer in your writing. Examples: This essay talks about..., In this essay, I analyse..., This essay consists of three parts... The first part talks about..., In conclusion,...

It looks like you are missing a Background move in your text, which highlights background information and previous literature on the topic. Try including linguistic cues to make this move clearer in your writing. Examples: The past decade has seen..., Recent studies indicate..., It is generally accepted that..., the concept has previously been thought to be...

It looks like you are missing Contrast/Question move, which highlights the critical insights in your essay. Try including linguistic cues to make this move clearer in your writing. Examples: However, the issue seems to be..., the study fails to consider, little research has been done...,...raises various questions...
What does success look like?

- The writing exercise was meaningful without AcaWriter, but with AcaWriter it was rated significantly more useful.
- Students who used AcaWriter made significantly more academic rhetorical moves in their revised essays.
- A significantly higher proportion of AcaWriter users improved their drafts (many students degraded them across drafts).
- Students who used AcaWriter produced higher graded submissions if they engaged deeply with AcaWriter’s feedback.
What does success look like?  
Students feedback on AcaWriter

“It's like having a tutor or another person check and give constructive feedback on your work.”

What does success look like? Student feedback on AcaWriter

“When you’re editing your own writing, you automatically think that your work sounds good and that all your ideas and views have been clearly conveyed. This exercise was useful in the sense that it indicated areas where I needed to be more explicit, which on my own I would not have noticed.”

What does success look like?
Student feedback on AcaWriter

“I think what is being taught is something I was already aware of. However, by being forced to actually identify ways of arguing, along with the types of words used to do so, it has broadened my perspective. I think I will be more aware of the way I am writing now.”

What does success look like?

Educator feedback on AcaWriter

“We can’t afford to give formative feedback when we have 400 students because it already takes us maybe about 20 hours to mark one class of these assignments — and so we can’t have the tutors spend that time again giving formative feedback. So, we had to do it in a way that is time-efficient.”

https://opus.lib.uts.edu.au/handle/10453/136846
What does success look like?  
Educator feedback on AcaWriter

“Overall, since we’ve been working with CIC around written communication over the course of the last four of five semesters, **we have seen marked improvement in students’ written communication**. Overall their individual assignment pass-rate is going up... We are seeing improvements in the number of students who are either **meeting or exceeding the expectations** around written communication”

https://opus.lib.uts.edu.au/handle/10453/136846
UTS Student/Staff Orientation: https://LearningJourneys.uts.edu.au
Research site: https://cic.uts.edu.au/tools/clara
Platform: https://jearni.co

Instant feedback on learning dispositions
Knowledge, Skills & Dispositions

“Knowledge of methods alone will not suffice: there must be the desire, the will, to employ them. This desire is an affair of personal disposition.”

John Dewey

Dewey, J. How We Think: A Restatement of the Relation of Reflective Thinking to the Educative Process. Heath and Co, Boston, 1933
Knowledge, Skills & Dispositions

“One of the key issues emerging from these findings was the learner’s orientation towards the unknown, uncertainty and ambiguity, and their tendency to either retreat from it or move into it. The former effectively precludes deep learning, and the latter is the beginning point for it.”

Ruth Deakin Crick & Chris Goldspink

The CLARA assessment tool
A research-validated survey instrument assessing the multi-dimensional construct of “Learning Power”

Immediate visual analytic to provoke reflection

Feedback to stimulate self-directed change

60 item survey

A framework for reflection and coaching
Fragile, dependent, brittle.

Closed
Passive
Fragile & dependent
Fragmented data
Lacking inter and intra-personal awareness
Isolated
Rule bound
‘Done to’
A-critical

Receptive to learning and change

Resilient Agency

Hopeful
Curious
Creative
Strategic
Purposeful
Collaborative
Persistent
Aware
Sense making
Connecting data

With hundreds of profiles, meaningful statistics can be performed to test for significant cohort changes / differences.

We can derive through cluster analysis significantly different cohort profiles, inviting reflection and possibly intervention for those who might be judged at risk.
CLARA is integrated into Learning Journeys using the https://jearni.co platform
For more examples see:

http://dx.doi.org/10.18608/jla.2016.32.2
Caution! A Learning Analytics system makes educational claims (implicitly or explicitly)

Every analytics system is making “EPA Claims”

Those EPA claims are codified (in part) as Algorithms
Algorithmic Accountability
Algorithms that make us Accountable

To ourselves, or to others.

In some cases, more objectively, efficiently and rewardingly than a human can.
Making

Algorithms that make us Accountable

Accountable
Expertises/stakeholders and key transitions in designing a Learning Analytics system

Learning Theory

Learning Analytics Researcher

Educational/Learning Sciences Researcher

Learning Outcomes

Learning Analytics

Educator

User Interface

Educational Insights

Programmer

Software, Hardware

Data

Algorithm

\[ s_i = \frac{\sum_{j=1}^{k} \delta(l_i = ln_j)cn_j}{k} \]
Accountability in terms of: Computer Science

IF... THEN... \[ s_i = \sum_{j=1}^{k} \frac{\delta(l_i = ln_j)cn_{ij}}{k} \]
Accountability in terms of: User-Centred Design

IF... THEN... $s_i = \sum_{j=1}^{k} \delta(l_i = ln_j)cn_{ij}$

Educational/Learning Sciences researcher

Learning Theory

Learning Analytics Researcher

Design Process

Programmer

Learning Outcomes

Educational Insights

Learner

Educator

User Interface

Software, Hardware

Data
Accountability in terms of: Learning Sciences

Educational/Learning Sciences researcher → Learning Theory → Learning Analytics Researcher

IF... THEN... $s_i = \sum_{j=1}^{k} \delta(t_i - ln_j)cn_j/k$

Educational Insights → Learning Outcomes → User Interface

Educator → Learner

Programmer

Software, Hardware

Data
Algorithmic accountability [deep dive]

http://simon.buckinghamshum.net/2016/03/algorithmic-accountability-for-learning-analytics
These kinds of tools go far beyond current products: they require innovation.
Giving educators and students agency in shaping AI/Analytics requires control over the code.
But universities also want to see impact.

Faculty research groups are rarely incentivized or equipped to deliver robust services to thousands of students and staff.
notes on UTS organisational strategy
**UTS-WIDE CONSULTATIONS & STRATEGIC ALIGNMENT**

- **2011**: Envisioning “the Data Intensive University”
  - DIU UTS-wide Forum

- **2012**: Connected Intelligence Working Party
  - UTS-wide consultations and interviews

- **2013**: Connected Intelligence Strategy
  - Privacy & Ethics Forum Plans for a Masters Degree

- **2014**: Masters Degree Launches
  - Analytics Pilots in Faculties
  - CIC Staffing Grows
  - First Pilot Evaluation Data

- **2015**: Director Appointed
  - Launch of the Centre
  - UTS-wide engagement
  - Collaboration Proposals Invited & Projects Initiated

- **2016**: Growing number of UTS & Industry Partnerships
  - Analytical Tools Maturing
  - Academic Board
DEVELOP & DEPLOY ANALYTICS ACROSS UTS

2019 cic.uts.edu.au
Architecting for Innovation + Impact?
Architecting for Innovation + Impact?

IT SERVICES MODEL:
Analytics based in BI or LMS team
Architecting for Innovation + Impact?

FACULTY RESEARCH MODEL:
Analytics based in a centre/school
Architecting for Innovation + Impact?

**HYBRID INNOVATION/SERVICES MODEL:**
Analytics based in a non-faculty centre reporting to DVC (Education), staffed by academics + professional admin team.
An experiment in organisational innovation... *(EDUCAUSE Review feature article, 2018)*

**CONTEXT**

Founded 2014, following 3 years’ cross-UTS consultation and development of a **Connected Intelligence Strategy**

Now an internationally leading centre in **Learning Analytics** (i.e. Educational Data Science)
Architecting for **Innovation + Impact?**

**Board Room**
VC/DVCs/Deans/Directors

**Common Room**
Academic staff

**Server Room**
IT Division

**CIC Skillset**: strong interpersonal skills
ADVANTAGES THAT THIS ORG STRUCTURE BRINGS

- Reporting directly to a DVC, and talking directly to other operational directors, gets stuff done.
- Baseline funding provides invaluable stability for planning projects and staff.
- Operating within the DVC’s Education & Students Office enables close coupling with student services and teaching innovation.
- Operating outside a faculty provides agility for decision-making, and helpful neutrality.
Intelligence Augmentation:
As Analytics/Al move into higher order competencies, a key role is less to judge and act autonomously, and more to provoke productive human reflection
What we take to be “distinctively human” has always been in transition, but now at unprecedented pace. The task of Learning Analytics may increasingly be to make persistent and visible what until now has remained ephemeral and invisible. LA+LD designs this as formative feedback to provoke reflection, insight, creativity, and deeper learning.
Balancing and aligning the elements

Learning Analytics
User Experience

Learning Analytics +
Learning Design

Learning Analytics
Co-design

Organisational
Strategy