BCNET
Shared IT Services for Higher Education & Research

Conference 2018

What's Happening in Those Online Discussions? Evaluating Learner Engagement Through Analytics

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…in a world of larger and larger data sets, increasing populations of increasingly diverse learners, constrained education budgets and greater focus on quality and accountability (Macfadyen & Dawson, 2012), some argue that using analytics to optimize learning environments is no longer an option but an imperative…

…Education can no longer afford not to use learning analytics. As Slade and Prinsloo (2013) maintain, "Ignoring information that might actively help to pursue an institution's goals seems shortsighted to the extreme" (p. 1521).

Macfadyen *et al.*, 2014

A quick outline

- What the heck is learning analytics anyway?
- Case study: Social network analysis of learner engagement
- What does an institution need to get there?

SOLAR
SOCIETY for LEARNING ANALYTICS RESEARCH

Learning Analytics:

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 learning occurs.

http://www.solaresearch.org

Interdisciplinary collaboration

Social Sciences/Education	Technical/Analytic
• social sciences • education • (educational) psychology • psychometrics • cognitive science • educational technology • learning design • art and design • and others…	• statistics • data visualization and visual analytics • educational data mining • computer science • machine learning • natural language processing • human-computer interaction • and others….

Where has LA come from?

LA draws from, and is closely tied to, a series of other fields of study including

- Business intelligence
- Web analytics
- "Academic analytics" (2005 -)
- Educational data mining (EDM)(~2000 -)
- "Action analytics" (~2008 -)

Elias, 2011

Possible LA goals

- Learner self-awareness
- Monitoring and tracking
- Reflection and research
- Evaluation and planning
- Reporting and communication

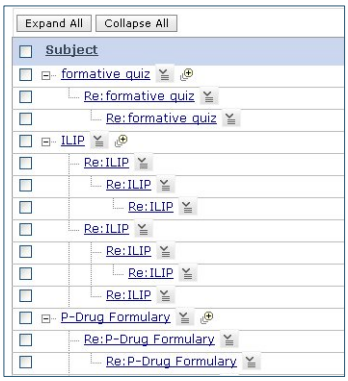
adapted from Kay (2013)

Learning analytics has the potential to….

- Empower students
- Offer instructors faster formative feedback
- Identify, earlier, students in need of support
- Illuminate curriculum connectivity
- Improve curriculum alignment
- Improve assessment of learning
- Improve evaluation of teaching

Case study: Using SNA to exploring learner engagement

Forum 1



Forum 2

A use case: Social network analysis (SNA)

Driver 1: Interest in the development of 'learning communities'

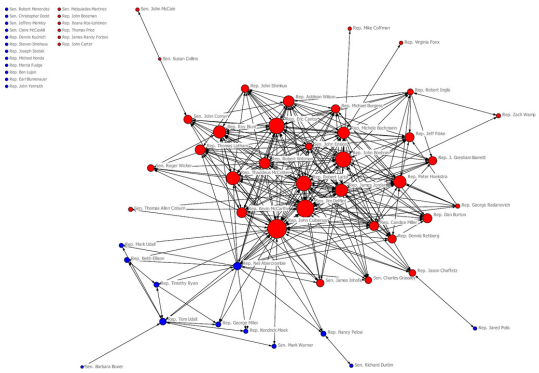
- Learning is social! - Pedagogical benefits of socio-constructivist learning
- Robust and diverse peer networks promote student study persistence and success (Astin, 1993; Light, 2001).
- Interest in promoting dynamic learner interaction with peers, learning materials and teachers (Gabelnick, MacGregor, Matthews, & Smith, 1990; Levine Laufgraben & Shapiro, 2004)
- Development and support of learning communities has become a common goal (Cho, Lee, Stefanone & Gay, 2005; Shapiro & Levine, 1999)
- ICTs can facilitate learner-to-learner communications and engagement, promoting the development of social networks and sense of community (Brook & Oliver, 2003; Hew & Cheung, 2003; Palloff & Pratt, 1999).

Driver 2: SNA emergence as a key tool for social analysis

…the process of investigating social structures through the use of networks and graph theory. It characterizes networked structures in terms of nodes (individual actors, people, or things within the network) and the ties, edges, or links (relationships or interactions) that connect them. Examples of social structures commonly visualized through social network analysis include ***social media networks****,* ***memes spread****,* ***friendship and acquaintance network****s,* ***collaboration*** *graphs,* ***kinship****,* ***disease transmission****, and sexual* ***relationships****.*

Wikipedia 2018

Relationships between United States Congress twitterers
showing "indegree centrality"
February 3, 2009
mediaczar.com/blog



Network metrics

- Centrality (degree, betweenness, closeness)
- Network density
- Homophily
- Bridge nodes

Use case: Using SNA to exploring learner engagement

Expand All | Collapse All

- Subject
- Next meeting (June)
  - Re:Next meeting (June)
    - Re:Next meeting (June)
      - Re:Next meeting (June)
- First Meeting Minutes
- Lecturer Helper/Liason
  - Re:Lecturer Helper/Liason
    - Re:Lecturer Helper/Liason
      - Re:Lecturer Helper/Liason
        - Re:Lecturer Helper/Liason
- New Feedback Team
  - Re:New Feedback Team
    - Re:New Feedback Team
- Poem return
  - Re:Poem return

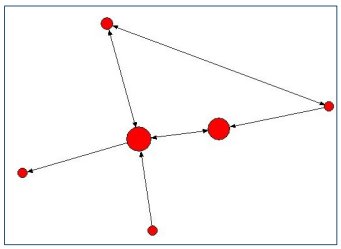
Forum 1

Expand All | Collapse All

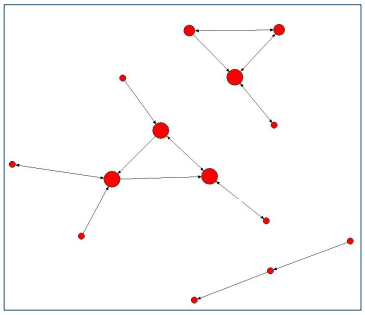
- Subject
- formative quiz
  - Re:formative quiz
    - Re:formative quiz
- ILIP
  - Re:ILIP
    - Re:ILIP
      - Re:ILIP
  - Re:ILIP
    - Re:ILIP
      - Re:ILIP
    - Re:ILIP
- P-Drug Formulary
  - Re:P-Drug Formulary
    - Re:P-Drug Formulary

Forum 2

Example 1: Cliques

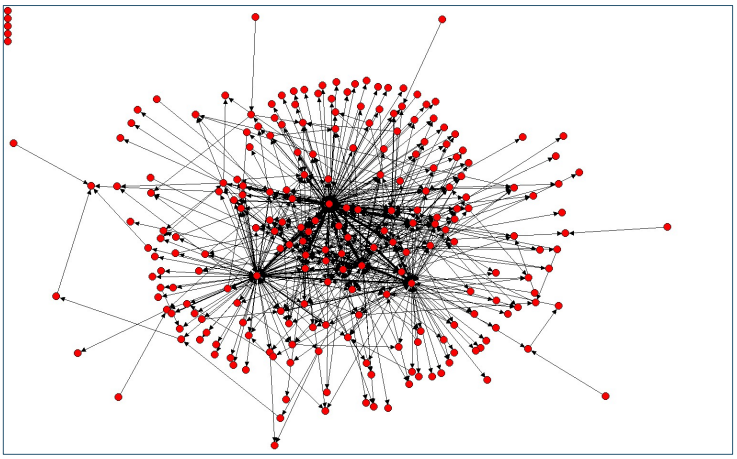


Forum 1

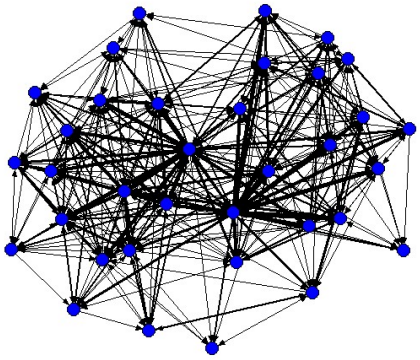


Forum 2

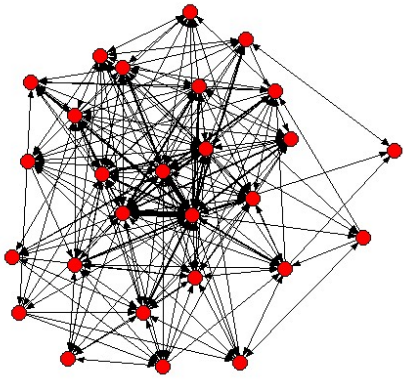
Example 2: Disconnected students



Example 3: Network density

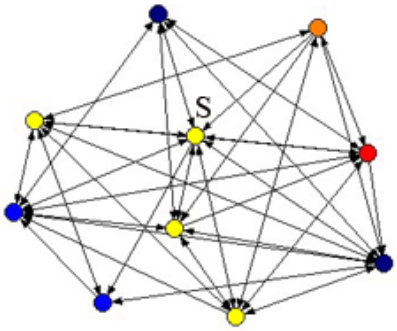


Sociology



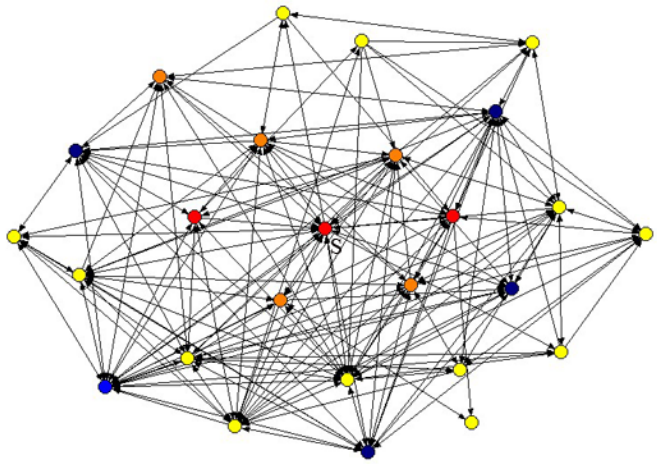
Biology

Example 4: Engagement by high and low performers

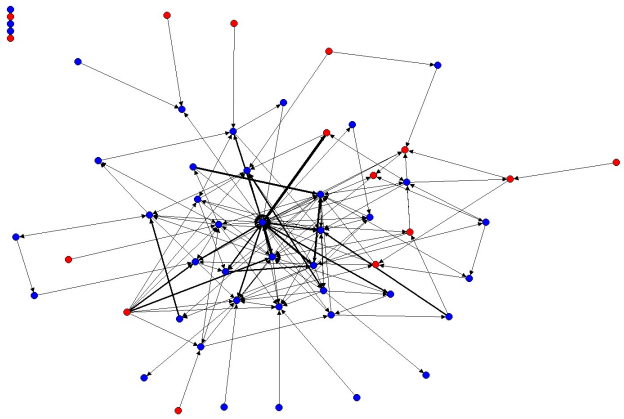


Red = A; Orange = B; Yellow = C; Blue/black = D or Fail.

Red = A; Orange = B; Yellow = C; Blue/black = D or Fail.

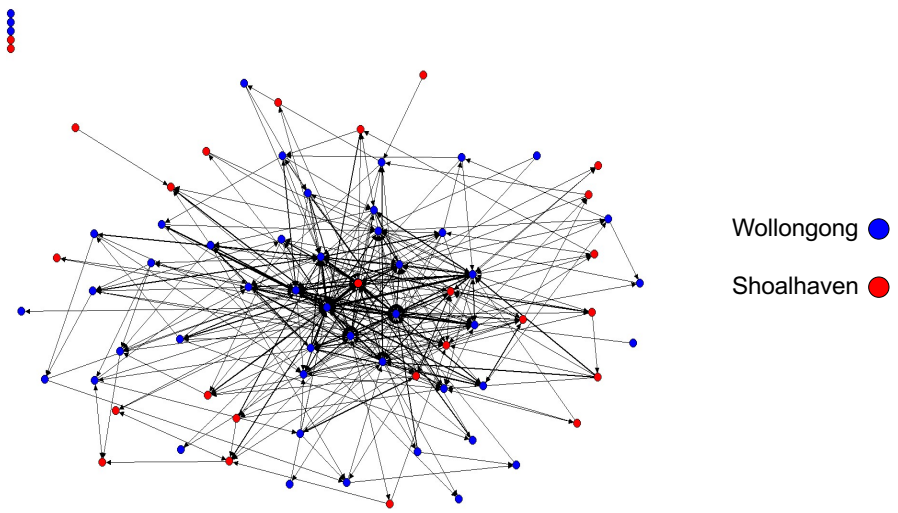


Example 5: Cohort integration

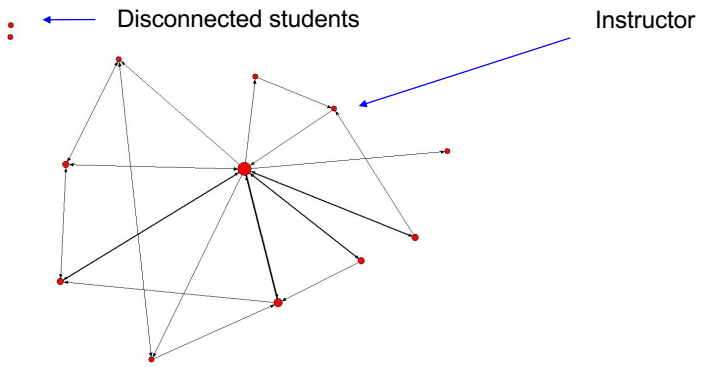


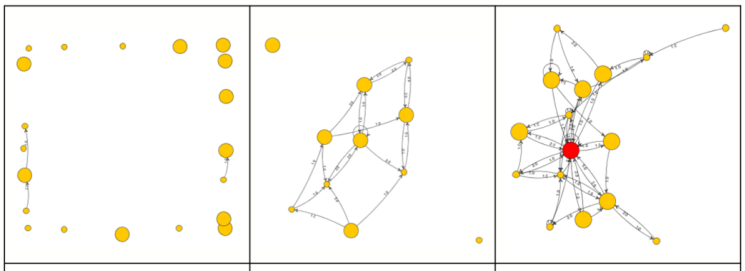
Wollongong

Shoalhaven



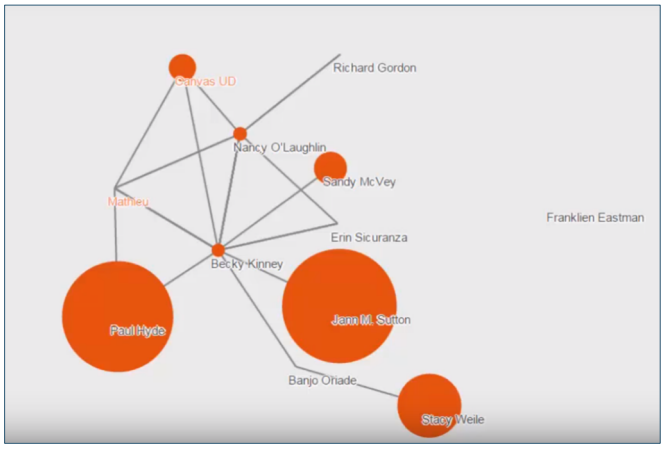
Example 6: Supporting instructor reflection



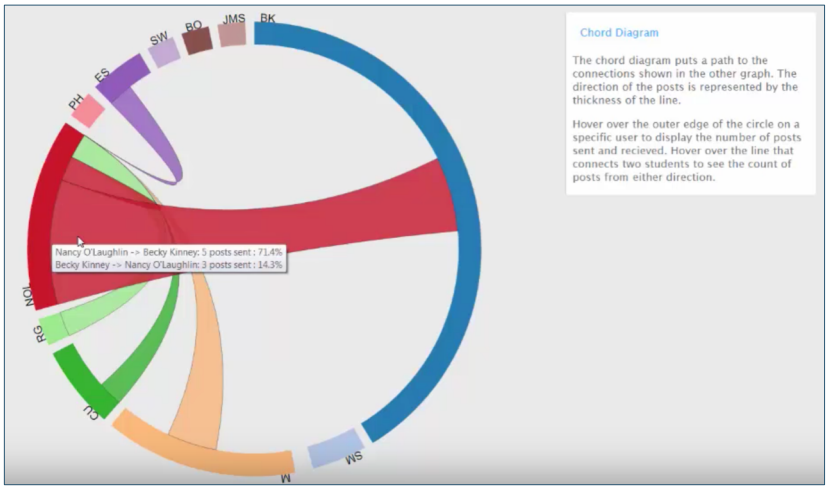


Introduction	Learning Outcomes	Technology Topic
22 posts 21 participants	53 posts 11 participants	78 posts 17 participants
Students were required to post an introduction	Students were required to post their own learning outcomes and comment on the learning outcomes of two of their peers	Students were asked to respond to two questions
Minimal moderation	Minimal Moderation	Moderated *(Note: Red node is instructor)*

Linda Corrin, University of Melbourne



Threadz LTI for Canvas, Eastern Washington University
https://threadz.ewu.edu/



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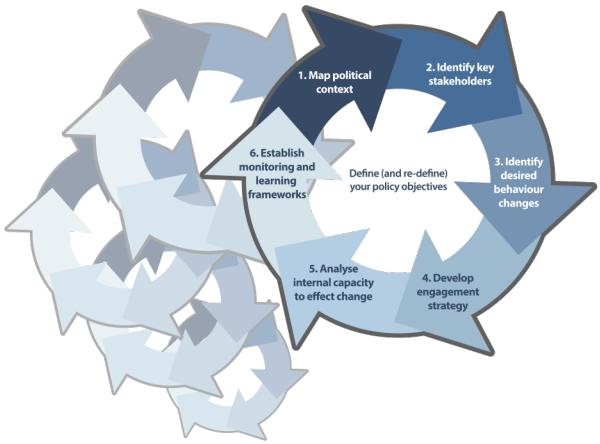

Ferguson, R., Macfadyen, L. P., Clow, D., Tynan, B., Alexander, S., & Dawson, S. (2014). Setting Learning Analytics in Context: Overcoming the Barriers to Large-Scale Adoption. *Journal of Learning Analytics*, 1(3), 120-144. Retrieved from http://epress.lib.uts.edu.au/journals/index.php/JLA/article/view/4077/4421

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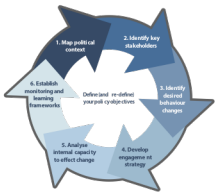


Define (and re-define)

- Why
- What is the goal?
- What do you want to change or improve?
- Align with existing goals?

Map political context

- Is there interest, and by whom
- Are there likely or identified champions
- Evidence supporting your case
- Barriers
- Other initiatives
- Institutional stance on data/privacy

Identify key stakeholders

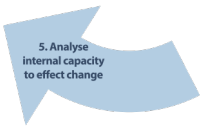
- Who is the target audience. More than one?
- Include faculty and students in development
- Origin of the effort:
  - IT
  - Learning & Teaching
  - Institutional Research
  - Student Association
- Capacity
- Capability
  - Data literacy

Identify desired behaviour changes

- What institutional changes are needed
- Change culture
- Desired outcomes
- Progress markers

Develop engagement strategy

- Data needs
- Access & availability
- Technical infrastructure
- How to engage leaders
- How to promote buy-in
- Data governance & ethics



Analyze internal capacity to effect change

- Do we have the skills
- Resource availability
- Capacity to embark on an initiative
- Capability at this time
- Training
- Service infrastructure

Establish monitoring and learning frameworks

- How will you monitor progress
- What will success look like

Principles for Learning Analytics

1. LA as a moral practice
2. Students as agents (and collaborators), not just recipients
3. Recognition that student identity and performance (and thus labels and categories) are temporal constructs
4. Student success is complex and multidimensional - recognition of the incompleteness and biases of our data
5. Transparency of purpose
6. The necessity of using the data

Slade & Prinsloo, 2013

On data governance….

Data governance is an emerging discipline with an evolving definition. The discipline embodies a convergence of ***data quality, data management, data policies, business process management, and risk management*** *surrounding the handling of data in an organization. Through data governance, organizations are looking to exercise positive control over the processes and methods used by their data stewards and data custodians to handle data.*

Data governance is a set of processes that ensures that important data assets are formally managed throughout the enterprise.

Wikipedia, 2014
http://en.wikipedia.org/wiki/Data_governance

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Prepare to discuss ethical questions…

Relating to research and review of data

- Ethical questions about purpose: Why is data being collected? To what end? (Financial? Educational?)
- Ownership of data
- Informed consent, privacy, de-identification
- How will data be handled and protected? Who should have access to it?
- Ethics of surveillance - Foucault's panopticon - power imbalance between educators/institution and learners
- …but in parallel with changing attitudes to privacy and self-disclosure

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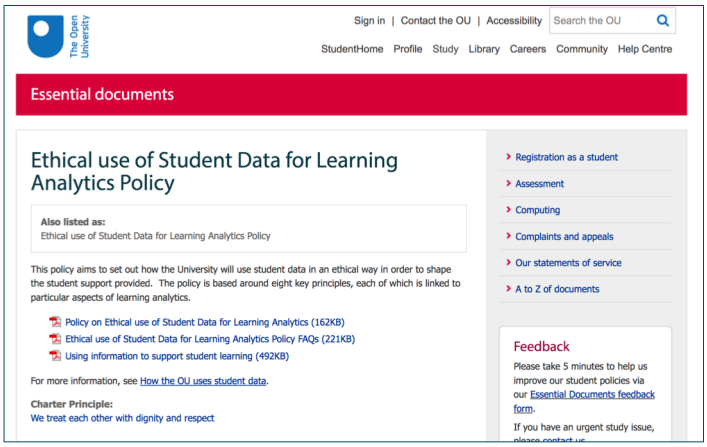

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Essential documents

Ethical use of Student Data for Learning Analytics Policy

Also listed as:
Ethical use of Student Data for Learning Analytics Policy

This policy aims to set out how the University will use student data in an ethical way in order to shape the student support provided. The policy is based around eight key principles, each of which is linked to particular aspects of learning analytics.

- Policy on Ethical use of Student Data for Learning Analytics (162KB)
- Ethical use of Student Data for Learning Analytics Policy FAQs (221KB)
- Using information to support student learning (492KB)

For more information, see How the OU uses student data.

Charter Principle:
We treat each other with dignity and respect

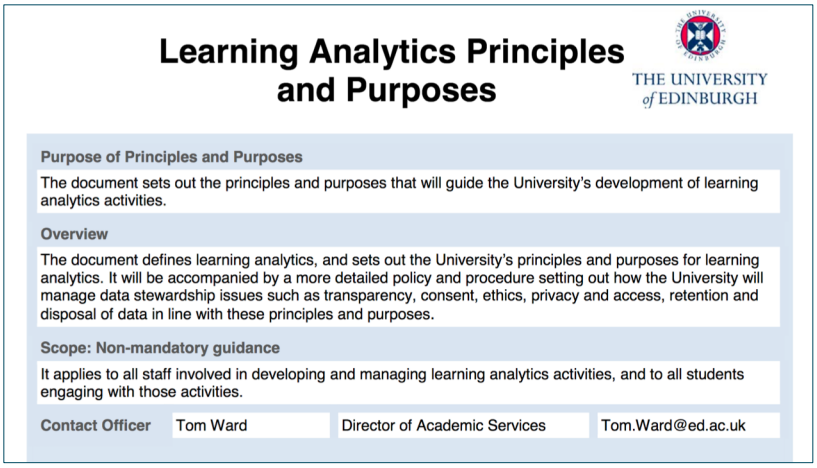
- Registration as a student
- Assessment
- Computing
- Complaints and appeals
- Our statements of service
- A to Z of documents

Feedback

Please take 5 minutes to help us improve our student policies via our Essential Documents feedback form.

If you have an urgent study issue,

UK Open University
http://www.open.ac.uk/students/charter/essential-documents/ethical-use-student-data-learning-analytics-policy#



Learning Analytics Principles and Purposes

THE UNIVERSITY of EDINBURGH

Purpose of Principles and Purposes

The document sets out the principles and purposes that will guide the University's development of learning analytics activities.

Overview

The document defines learning analytics, and sets out the University's principles and purposes for learning analytics. It will be accompanied by a more detailed policy and procedure setting out how the University will manage data stewardship issues such as transparency, consent, ethics, privacy and access, retention and disposal of data in line with these principles and purposes.

Scope: Non-mandatory guidance

It applies to all staff involved in developing and managing learning analytics activities, and to all students engaging with those activities.

Contact Officer	Tom Ward	Director of Academic Services	Tom.Ward@ed.ac.uk

University of Edinburgh
https://www.ed.ac.uk/files/atoms/files/learninganalyticsprinciples.pdf

Code of practice for learning analytics

June 2015

Introduction

Learning analytics uses data about students and their activities to help institutions understand and improve educational processes, and provide better support to learners. It should be for the benefit of students, whether assisting them individually or using aggregated and anonymised data to help other students or to improve the educational experience more generally. It is distinct from assessment, and should be used for formative rather than summative purposes.

Educational institutions in the UK already have information management practices and procedures in place and have extensive experience of handling sensitive and personal data in accordance with the **Data Protection Act 1998 (DPA)**. By transferring and adapting this expertise to regulate the processing of data for learning analytics, institutions should establish the practices and procedures necessary to process the data of individuals lawfully and fairly.

Responsibility

JISC UK
https://analytics.jiscinvolve.org