Data, analytics and learning: Interdisciplinary approaches to the generation of actionable knowledge

Dr Kate Thompson
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Interdisciplinary research
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Different cultures:
Ways of working
Methods
Data types
Values
Motivations
Epistemologies
Uncertainty tolerance
Etc.
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Different cultures:
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Etc.

Instructor

Learning Scientist

Learning analytics
Interdisciplinary research: Teams

What processes, methods and/or tools facilitate development of this?
Interdisciplinary research: Steps

1. identification of an appropriate question;
2. development of a shared vocabulary;
3. the co-creation of boundary negotiating objects;
4. the use of tools for visualizing and combining data; and
5. a new, more connected understanding of the question.

Pennington et al. (2015)
Interdisciplinary research: Challenges

1. High diversity
2. Deep knowledge integration
3. Large size
4. Goal misalignment
5. Permeable boundaries
6. Geographic dispersion
7. Task interdependence

National Academy of Sciences (2015) Enhancing the Effectiveness of Team Science
Interdisciplinary research: Challenges

Collaboration:
- Geographic spread
- lack of centralized funding for bringing team members together
- team members’ experience working together

Epistemology:
- Identification, alignment and differentiation of underlying beliefs
- how would we make a shared model of learner activity that fairly accounted for the individual perspectives?

Tools:
- identification of appropriate tools we would need to communicate, share data, visualize analyses and create and share models.
Multimodal data for learning
Interdisciplinary approaches: Learning by design

Kate Thompson (School of Education and Professional Studies, Griffith University, Australia); Lucila Carvalho (Institute of Education, Massey University, New Zealand); Anindito Aditomo (Faculty of Psychology, The University of Surabaya, Indonesia); Yannis Dimitriadis (School of Telecommunications Engineering, University of Valladolid, Spain); Gregory Dyke (Advanced Studies on Language Complexity – ASLAN, Universite de Lyon, France); Michael A. Evans (Department of Curriculum, Instruction, and Counselor Education, North Carolina State University, USA); Peter Goodyear (School of Education and Social Work, University of Sydney, Australia); Lixiao Huang (North Carolina State University, USA); Maryam Khosronejad (School of Education and Social Work, University of Sydney, Australia); Roberto Martinez-Maldonado (University of Technology, Sydney, Australia); Peter Reimann (School of Education and Social Work, University of Sydney, Australia); Dewa Wardak (School of Education and Social Work, University of Sydney, Australia)
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Interdisciplinary approaches: Learning by design

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Audio recordings were collected, transcribed and the discourse coded for

(1) the role of *positioning* in collaboration and in the design process;
(2) *knowledge sharing* and *knowledge integration* practices;
(3) *phases of design*; and
(4) *decision-making*.

Video recordings were collected and the *use of tools* identified and analysed to inform the findings related to distributed orchestration.

Video and audio recordings were both analysed for *gesture* and *engagement*, using a discursive psychology approach.

The *design artefacts* were also analysed using multimodal interaction analysis, in addition to *gestures* and *physical location of participants* (video) and the *discourse* (audio).
Interdisciplinary approaches: Learning by design

Design sketch used in MIA

Conversational Turns visualised in Tatiana

Markov transition diagram used in process analysis

Systems map - links between roles and tools used

Interdisciplinary approaches: Classroom analytics

Kate Thompson (School of Education and Professional Studies, Griffith University);
Sarah K. Howard (University of Wollongong);
Nick Kelly (Queensland University of Technology);
Harry Kanasa (Griffith University);
Jun Ma (University of Wollongong); Jack Yang (University of Wollongong);
Abelardo Pardo (University of Sydney);
David Ashe (University of Sydney); Lucila Carvalho (Massey University); Peter Goodyear (University of Sydney); Martin Parisio (University of Sydney)
Interdisciplinary approaches: Classroom analytics

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<th>Eileen (blue)</th>
<th>Gabrielle (green)</th>
<th>Lavina (red)</th>
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Thompson, K., Kelly, N., Ma, J., Yang, J., Howard, S. K., Carvalho, L. (under review). Temporal needs and representational affordances for multimodal learning analytics: the generation of actionable knowledge
Interdisciplinary approaches: Classroom analytics

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<tr>
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Next steps - The Creative Practice Lab
This presentation has drawn on:


Thompson, K., Kelly, N., Ma, J., Yang, J., Howard, S. K., Carvalho, L. (under review). Temporal needs and representational affordances for multimodal learning analytics: the generation of actionable knowledge.
Thank you!

Any questions?