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xAPI and Temporality

OPEN STANDARDS TO STORE AND ANALYSE TEMPORAL LEARNER DATA

25 April 2016 | lak16time | Danny Liu, Ed Moore, James Hamilton, Yvonne-Noemi Nemes

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Conceptions of temporality

PROCESSES AND SEQUENCES

- Reimann 2009
  - Variable-based: independent acting on dependent
  - Event-based: sequences of 'events' over time
- Zhou et al. 2010
  - Student-based: sequential patterns → common learning behaviours
  - Session-based: actions from a single session
  - Object-based: differentiates the objects of actions

Reimann, P. (2009) Time is precious: Variable-and event-centred approaches to process analysis in CSCL research. *International Journal of Computer-Supported Collaborative Learning*, 4(3), 239-257.
Zhou, M., Xu, Y., Nesbit, J. C. and Winne, P. H. (2010). Sequential pattern analysis of learning logs: Methodology and applications. In C. Romero, S. Ventura, M. Pechenizkiy and R. S. J. d. Baker (Eds.), *Handbook of educational data mining* (pp. 107-121). Florida: CRC Press.

¿Porque no los dos?

MULTIDIMENSIONAL TEMPORALITY

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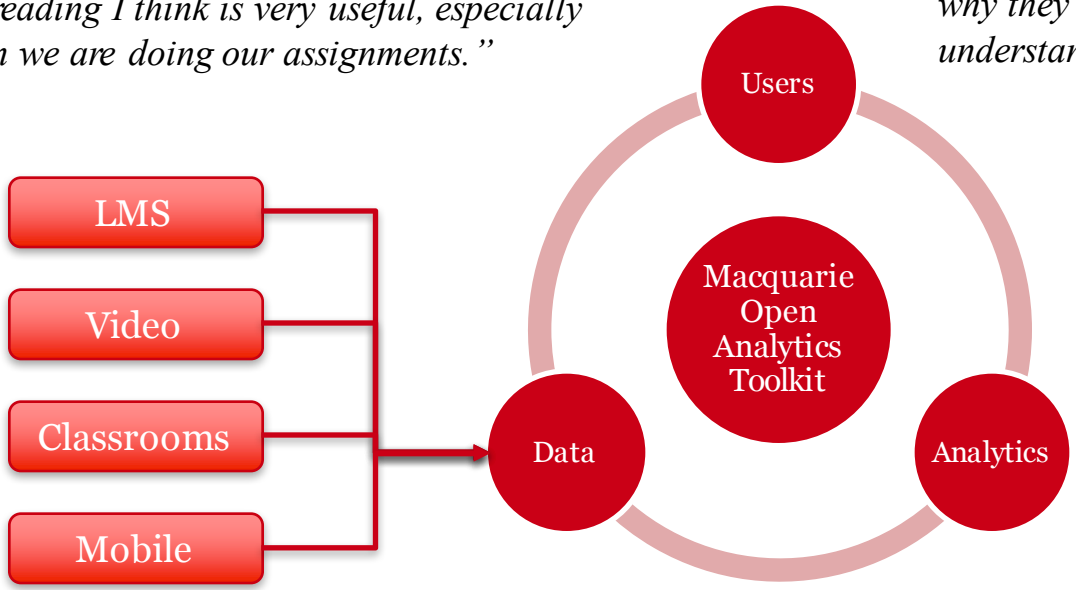
Openness

STORING AND ANALYSING TEMPORAL LEARNER DATA

"I know that what kind of articles other students are reading I think is very useful, especially when we are doing our assignments."

"...know what the top students were doing, why they were top students... getting an understanding of what they do differently..."



Storing learning experience data

LEVERAGING XAPI

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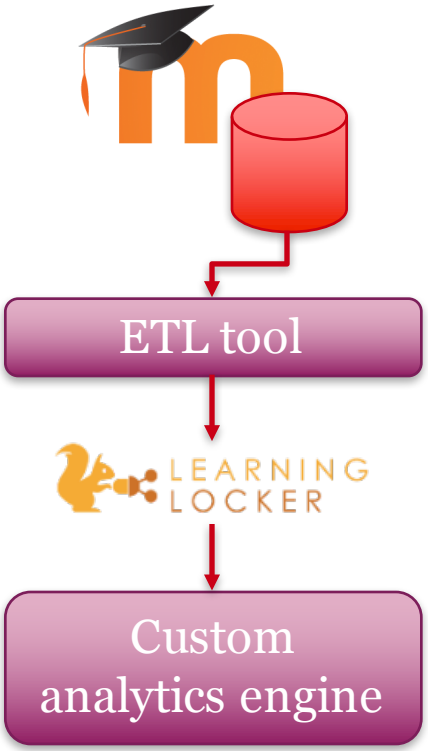


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Teacher-facing tools

EMPOWERING ANALYSES

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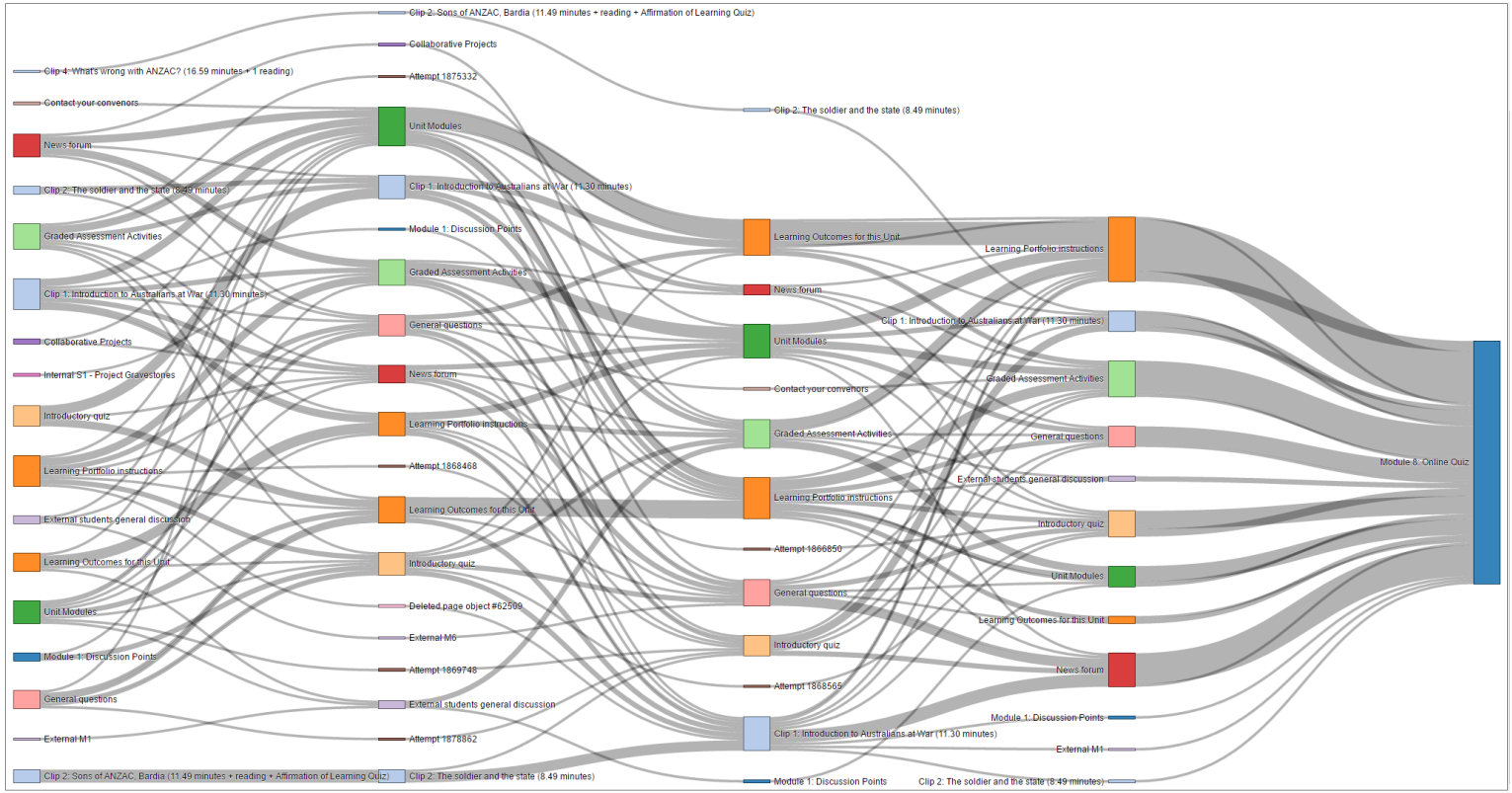
- Some thoughts, screenshots of interface, mockups of what teacher should be able to do

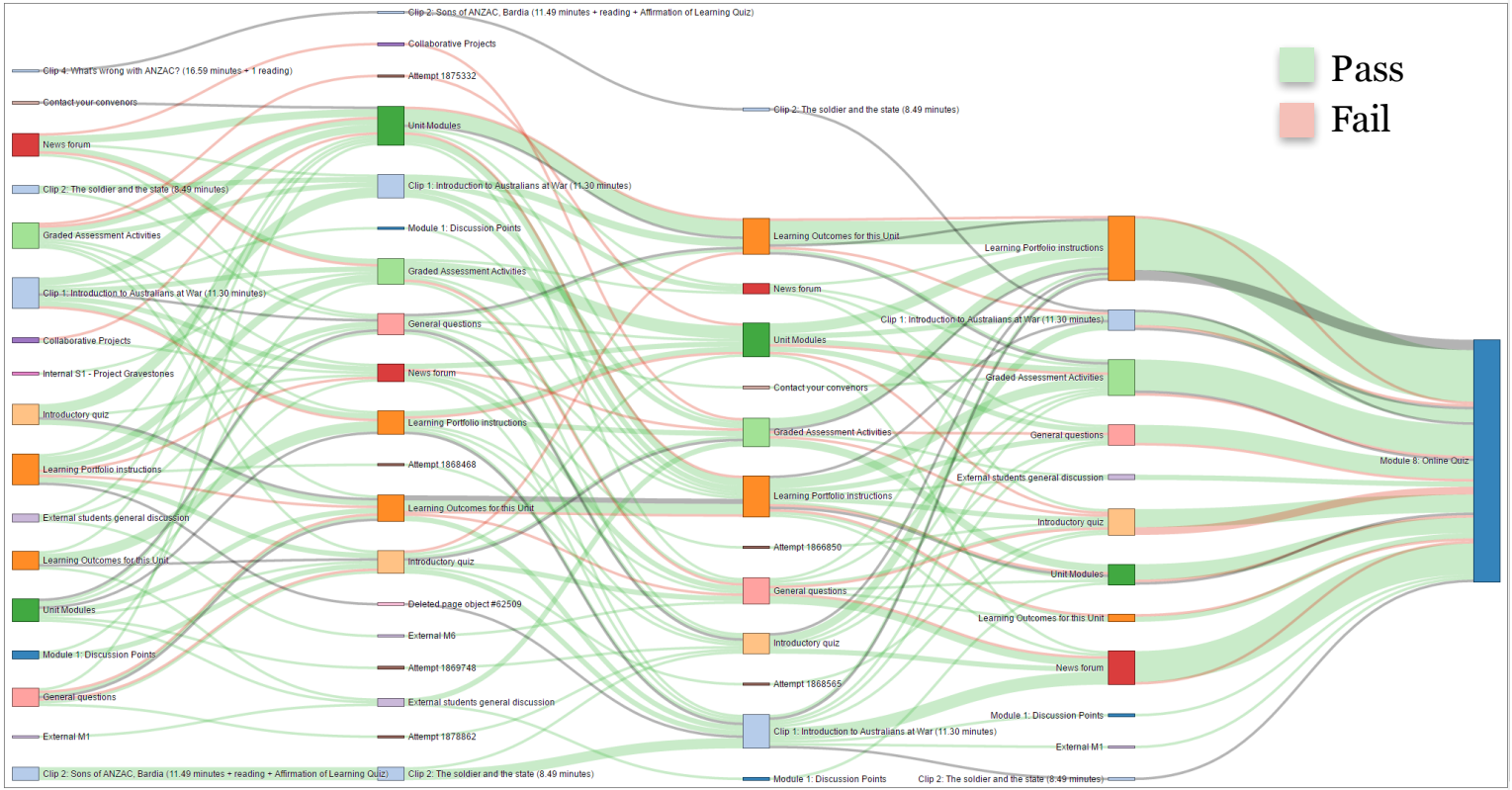
Understanding learning paths

EXAMPLE: SANKEY DIAGRAMS



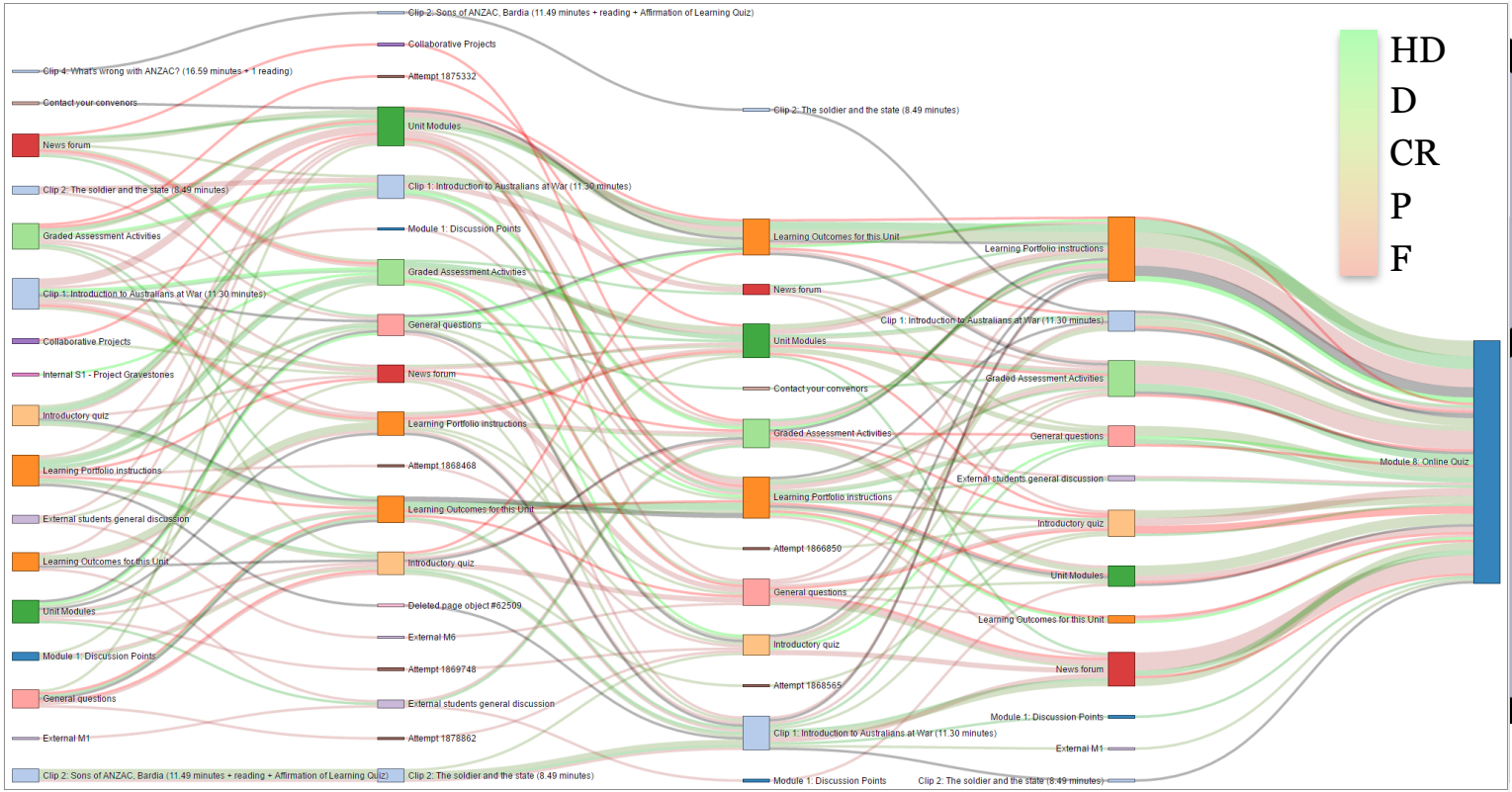
Understanding learning paths

OVERLAYING DATA – COURSE OUTCOME



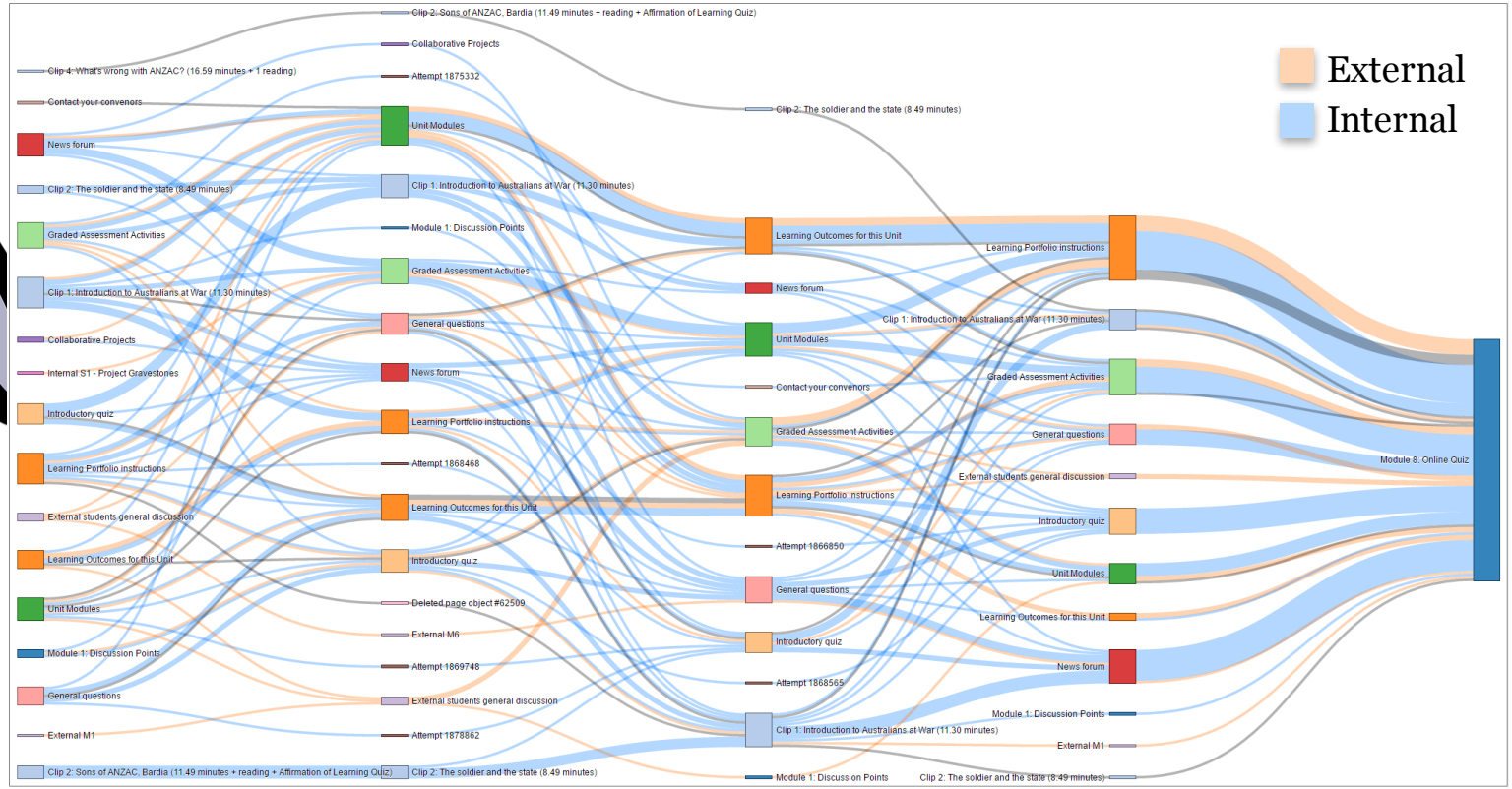
Understanding learning paths

OVERLAYING DATA – COURSE GRADE



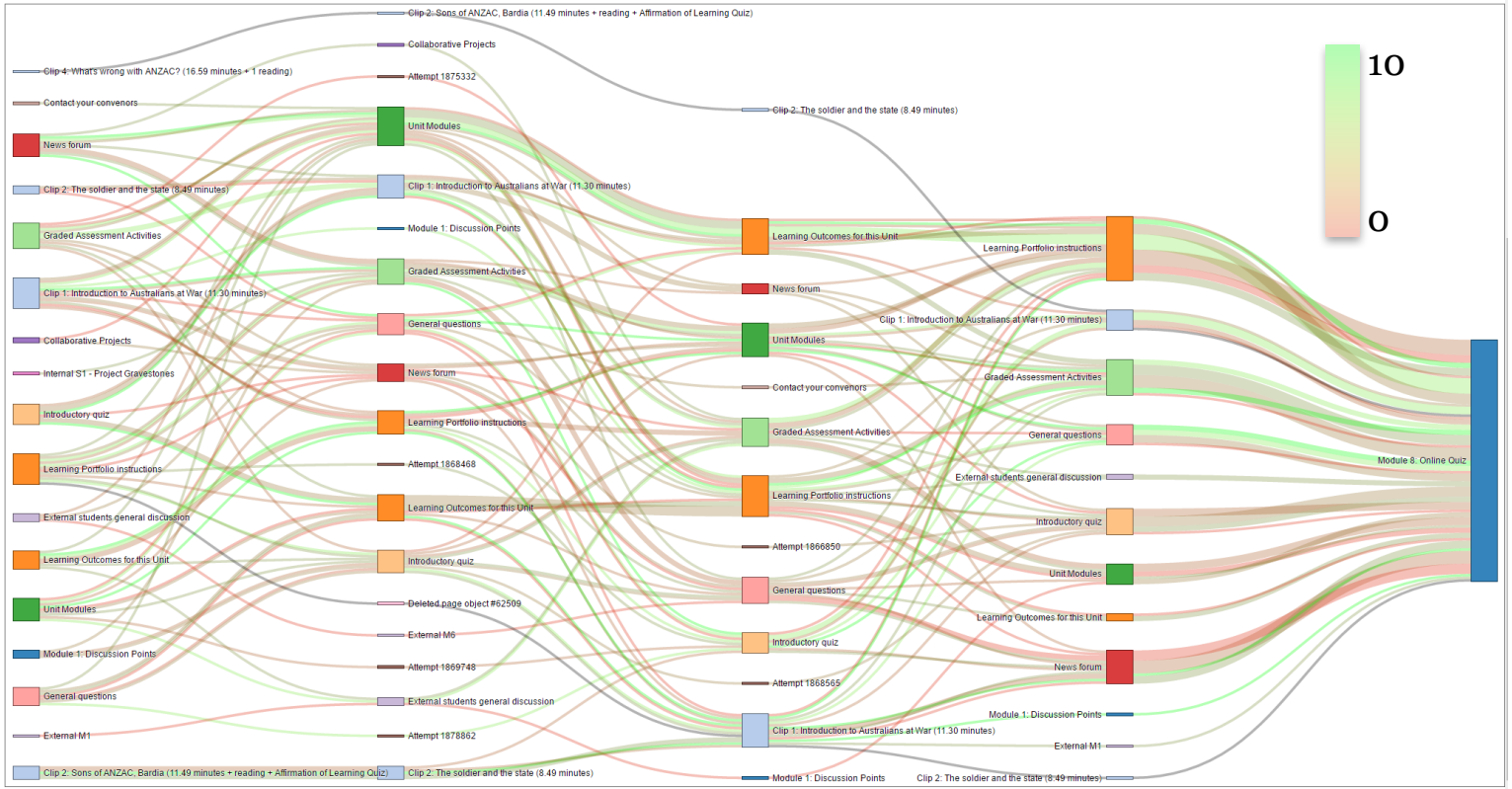
Understanding learning paths

OVERLAYING DATA – STUDY MODE



Understanding learning paths

OVERLAYING DATA – QUIZ PERFORMANCE



‘Understanding’ learning paths?

SANKEY DIAGRAMS

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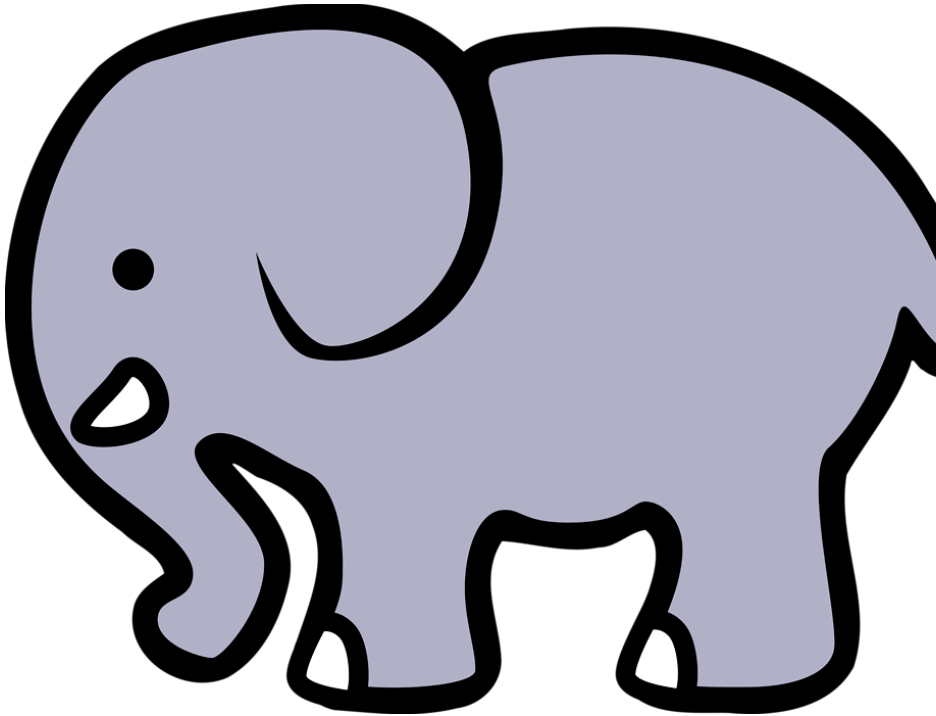
- Immediate concerns
  - What is a session?
  - When did these happen?
  - How long did they take?
  - What verbs are plotted?
  - What are meaningful overlays?
  - Is this all behaviourism???



Questions arising

FOR STUDENTS AND TEACHERS

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- Are there interesting and meaningful behaviour patterns?
- Does this reflect study strategies?
- How does this speak to learning design?
- What variables are interesting and meaningful?
- What kind of event/action/temporal granularity?

Questions arising

FOR THE LEARNING ANALYTICS COMMUNITY

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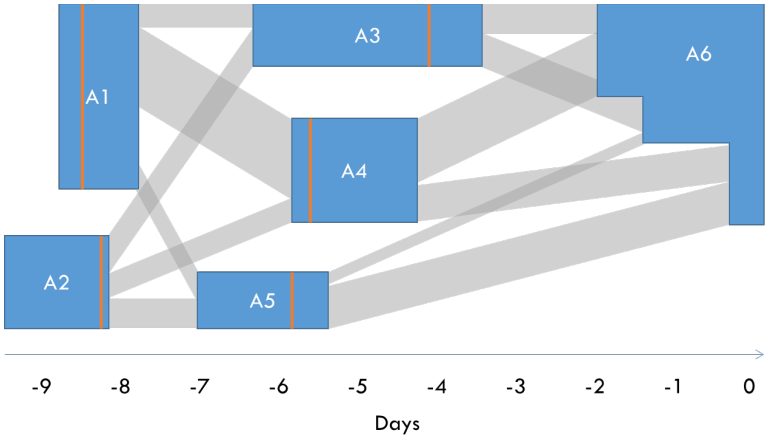
- How can other dimensions be represented meaningfully?
- What levels of context are most important?
- How else can we mine xAPI datastreams?
- How can we collaborate via open standards to co-develop better tools for practitioners?



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It takes a village

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