



## Evidence for Enhancement: Improving the Student Experience

# Learning Analytics: Using data to enhance the student experience

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### About this paper

This paper has been written for institutional managers and academics who are using, or wish to use, learning analytics to support the enhancement of the student experience. The aim of the paper is to help inform conversations with learning analytics experts in their institutions about some of the issues and challenges that are emerging from the learning analytics research field that may impact on institutional activities.

An overarching trend is the need to increase capacity for institutional staff and students to engage with ethics, design, understanding and using learning analytics. Where this has previously been the concern of a relatively small number of experts, it is becoming increasingly important that a broader community is equipped to participate in the conversation.

This is one part of a longer discussion paper<sup>1</sup> based on an adaptation of Clow's 2012 cycle of learning analytics. The main paper includes four key sections:

- data creation and collection
- working with and understanding data
- **using data to enhance the student experience (this paper)**
- implementing learning analytics in institutions.

The main paper also includes a series of 'hot topics', which we have made available as separate factsheets.

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<sup>1</sup> [www.enhancementthemes.ac.uk/docs/ethemes/evidence-for-enhancement/learning-analytics-discussion-paper.pdf](http://www.enhancementthemes.ac.uk/docs/ethemes/evidence-for-enhancement/learning-analytics-discussion-paper.pdf)

## Using learning analytics to enhance the student experience

This paper explores some of the ways in which learning analytics has been used to enhance the student experience. It explores two main areas: the use of learning analytics to support students at risk (interventions), and the use of learning analytics to improve curriculum and learning design.

### Interventions

The most common learning analytic tools used to direct interventions are predictive models and dashboards. These can help institutions identify students at risk, and then inform the development and deployment of interventions designed to help them improve their performance. Interventions can range from sending short messages reminding students to submit assignments to using machine learning technology to devise personalised learning pathways through a course of study.<sup>2</sup> Sclater (2017, p 115) lists several examples reproduced below:

- 'reminders sent to students about suggestion progression through the task
- questions to promote deeper investigation of the content
- invitations to take additional exercises or practice tests
- attempts to stimulate more equal contributions from participants in a discussion forum
- simple indicators such as red/yellow/green traffic signals, giving students an instant feel for how they are progressing
- prompts to visit further online support resources
- invitations to get in touch with a tutor to discuss progress
- supportive messages sent when good progress is being made
- arranging of special sessions to help students struggling with a particular topic'.

#### Good review

A Systematic Review of Learning Analytics Intervention Contributing to Student Success in Online Learning, Kew Si Na and Tasir (2017).

Interventions are designed to elicit a response in the student dependent on the purpose of the intervention, whether this is to submit an assignment, sign into the VLE and access particular learning activities, or seek support. In a review of 18 papers, Na and Tasir (2017) noted that interventions were concerned in the main with increasing engagement, addressing retention and increasing performance.

Sclater (2017) also notes that several factors may influence the effectiveness of interventions. These include:

- timing and frequency: it is important to consider when an intervention will be most effective and whether these will be repeated. Too often may result in students ignoring them, while positive feedback too soon may result in overconfidence.
- content: Sclater (2017) reports that the experience at Purdue indicated that students preferred personalised feedback even if the intervention itself was only a generic template that had been customised. Marist University implemented an

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<sup>2</sup> [www.ontasklearning.org](http://www.ontasklearning.org).

incremental approach where the tone of the intervention would become more serious if the student did not respond or their performance had not improved (Jayaprakash, Moody, Lauría, & Regan, 2014).

## Learning analytics and pedagogical approaches

When developing courses or learning materials, it is important to obtain evidence about how useful particular aspects of the course are to learners. Post-course evaluation and student representation have often been used as a source of evidence, but although they are vital mechanisms for capturing the student voice, they are reliant on the recollection of past events. Learning analytics can act as a source of useful data and evidence, its key strength being that it can provide this evidence in real time. Examining data produced by engagement with learning materials and activities can be the means of gaining detailed information about learners' immediate reactions to these and, subsequently, their learning behaviour within courses (Lockyer, Heathcote, & Dawson, 2013). Davies (2018) notes that a dashboard showing which areas of a course students are engaging with (and which they are not) may help direct lecturers' teaching activities and support, as well as influence design of future activities.

Additionally, course construction depends on the epistemological standpoints of those designing the course, whether these are conscious or unconscious, and this influences the pedagogical approach they use. Bakharia et al (2016) note: 'Much of this work (learning analytics)...is lacking in an understanding of the pedagogical context that influences student activities'. Linking these quite disparate fields of pedagogy (subjective, contested, debated and often deliberately ill-defined) and learning analytics (arguably objective, based on numerical data, algorithms and presented in a pseudo-scientific manner) is challenging. Several authors, including Lockyer et al (2013), Bakharia et al (2016) and Nguyen et al (2017) have suggested that the field of learning design provides a conceptual bridge between pedagogy and learning analytics:

'Essentially, learning design establishes the objectives and pedagogical plans, which can then be evaluated against the outcomes captured through learning analytics' (Lockyer, Heathcote, & Dawson, 2013).

As a field, learning design seeks to make explicit the thinking and processes that academics use when designing their courses (Hernández-Leo, Rodríguez-Triana, Salvador Inventado, & Mor, 2017). Mor and Craft (2012) define learning design as: 'the creative and deliberate act of devising new practices, plans of activity, resources and tools aimed at achieving particular educational aims in a given context'.

The Open University has carried out a substantial amount of work over the past decade investigating how student learning behaviours are stimulated by different learning designs, and rolling out learning design across module teams (Rienties, Nguyen, Holmes, & Reedy, 2017). The paper summarises much of the work the OU has carried out, including investigating VLE engagement and student performance, impact on student satisfaction and consideration of disciplinary adjustments. Four research areas were identified for future attention. These were:

- ensuring that learning design categories are appropriate, are used consistently by staff, and are both sufficiently precise and flexible
- determining which learning design activities will provide 'the optimum balance between student satisfaction and challenge in learning'
- surfacing the student perspective or voice in learning design

- identifying how learning analytics data collected in relation to learning design activities can be refined to surface 'fine grained learning behaviour'.

### For more information about learning design

Lockyer et al (2013), Nguyen et al (2017).

Look out for: Bart Rienties and Quan Nguyen, The Open University, UK.

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