

Designing learning analytics visualisations that align to learning design

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In the field of learning analytics there is an ongoing challenge for designers to create visualisations of data and analyses in ways that are meaningful to the audience and can be easily translated into action. The use of learning design as a frame through which to support good visualisation design is a key area of development and exploration gaining momentum in the learning analytics community. However, it has been observed that there is often a lack of thorough evaluation in the development of visualisations across learning analytics systems. In this interactive experimental session participants will be provided with a hands-on experience of effective design of learning analytics visualisations with reference to learning design. Participants will be given an opportunity to work together to develop a visualisation design for a particular learning design scenario, as well as a plan for the evaluation of the visualisation. The session is designed for anyone who has an interest in the design and development of learning analytics visualisations and participants do not need to have a technical background in data visualisation to attend.

Keywords: Learning Analytics, Learning Design, Visualisation

Background

The field of learning analytics has evolved over the past decade to provide many ways of exploring and analysing data about students to improve learning and learning environments. As analyses continue to increase in sophistication it is important that consideration is given to how such analytic outputs are presented to audiences, whether they be teachers, administrators, or students, in ways that promote understanding and action. The field is not short of visualisations of data, but concern has been expressed about the lack of evaluation of these visualisations to ensure that the audience can adequately interpret the data presented and determine the appropriate action or intervention to make (Corrin & de Barba, 2014; Jivet et al. 2018). Often these visualisations sit within online education systems (e.g. Learning Management Systems, Lecture Capture tools, etc.) which attempt to provide generic representations of the data to suit a multitude of contexts and designs. Another trend in this area is the focus on the visualisation of data that is easy to collect and analyse, which can result in the provision of visualisations that are not particularly meaningful to the user.

The important role of learning design in how student data is analysed and presented has long been promoted in learning analytics (Lockyer, Heathcote & Dawson, 2013) and acknowledged via the development of frameworks that bring learning design and learning analytics together (e.g. Authors, 2016). Designing visualisations that reference the underlying learning design creates the potential for visualisations to tell a story that the audience can understand, promoting aspects of the data that are key to informing future action (Echeverria et al., 2018). This requires a careful consideration of the data, design and visual tools which can result in more specialised visualisations for different learning design contexts. Evaluation of these visualisations with the target audience is vital to understanding how the visualisation is interpreted and to refine the visualisation design.

The Experimental Session

The aim of the proposed interactive experimental session is to raise awareness of the issues around the effective design of learning analytics visualisations with reference to learning design. The 50-minute session will begin with a brief overview of key principles related to visualisation design and learning design. A number of learning design scenarios along with key questions for analysis will then be presented to the group as a whole for which visualisations can be designed. The whole group will then be split into smaller groups, based on the interests of individual participants, and each group will be tasked with developing a visualisation design for a relevant scenario. Throughout the process of design groups will be asked to consider:

- What data sources will be required to address the scenarios/questions?
- What visualisations designs could be used to represent this data?
- Does the visualisation require any additional narrative elements to improve interpretation?
- How can the visualisation be evaluated?

Towards the end of the session each group will be asked to share their design and to highlight any significant challenges and/or evaluation ideas. Discussion will be encouraged to generate ideas to address any challenges and constructive feedback will be shared on the presented designs.

Facilitators

The experimental session will be facilitated by Associate Professor Linda Corrin and Dr Aneesha Bakharia who have worked together for a number of years on research and development of learning analytics systems.

Associate Professor Linda Corrin is the Academic Director, Transforming Learning at Swinburne University of Technology. Her research interests include learning analytics, digital literacy, feedback and learning design. Currently, she is working on several large research projects exploring how learning analytics can be used to provide meaningful and timely feedback to academics and students. Her early work on learning analytics dashboards highlighted the importance of providing a learning context to improve students' interpretation of dashboard visualisations. Linda is co-founder of the Victorian/Tasmanian Learning Analytics Network and a co-ordinator of the ASCILITE Learning Analytics Special Interest Group.

Dr Aneesha Bakharia is the Acting Director of Learning Analytics at the University of Queensland. Her work at UQ to date has focused on developing MOOCs for edX platform and blended on-campus courses. Aneesha's PhD research focused on text analytics with case studies in collaborative learning environments. She has also published broadly within the field of learning analytics, developed several well-known learning analytics applications, and has written 10 books on programming and web development.

Intended Audience

This interactive experimental session is designed for anyone who has an interest in the design and development of learning analytics visualisations. Participants do not need to have a technical background in data visualisation to attend. Participants from a variety of roles including learning analytics developers, learning designers, teachers and learning support staff are encouraged to participate and the interactive activities will be designed to take advantage of the different expertise in the room.

The experimental session aligns with the "Data Analytics & Evidence to Improve Teaching & Learning" key theme of this year's ASCILITE conference in that it aims to raise the awareness of participants as to important design considerations for improving how learning analytics visualisations can be designed and evaluated so as to improve teaching and learning.

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