

LEARNING DESIGN AND LEARNING ANALYTICS FOR TEACHER EDUCATORS

TAU 3 - INDIVIDUAL PROJECT REPORT

Jacqueline Batchelor, University of Johannesburg

BACKGROUND AND RATIONALE

This research project is set against the background of the COVID-19 pandemic that required higher educational institutions (HEIs) to make an unprecedented large-scale and rapid transition to online and remote teaching and learning. This rapid transition revealed just how disruptive the large-scale deployment of new technologies and associated pedagogies could be to an education system without an adequate lead time and preparation. Lecturers found themselves at the centre of this storm, having to redesign curriculum offerings and master new skills utilising new technological solutions with varying success. On an institutional level, learning analytics became more prevalent to track and report student progress and success and monitor curriculum delivery.

According to Siemens (2013, p. 1381), learning analytics is viewed as the "measurement, collection, analysis and reporting of data about students and their contexts, for the purposes of understanding and optimizing learning and the environments in which it occurs". As teacher educators in the Faculty of Education at the University of Johannesburg, Lecturers confidently use technology to deliver the curriculum. However, in the first year of the pandemic, it became apparent that even though they used technology confidently to teach and assess, they found it challenging to articulate the particular reasons for their pedagogical decisions. They relied heavily on their tacit knowledge of student behaviour and their own beliefs about learning to guide the design of learning activities, selection of resources and student support. Data analytics functions available in the learner management system, such as the retention centre to identify at-risk students, were underutilised, and lecturers did not explicitly interrogate assessment and student engagement data. Module design decisions impacting student engagement and success were thus not easily sharable.

Conole (2012), described learning design as a process whereby teachers or designers plan learning instances to reach desired learning outcomes whilst matching specific pedagogical approaches with the most suitable technological tools and services available in a specific educational space. Learning design as an area of research and development includes gathering empirical evidence to understand the design process and developing a range of learning design resources, tools and activities. A shift was needed for lecturers to move from a belief-based implicit approach to a more explicit design-based approach and to take note of the importance of learning analytics in the design of their modules. Such an approach encourages reflective and scholarly practices that promote sharing and discussion.

The Faculty of Education strives toward dynamic knowledge-making for the 21st Century. This implies future-oriented and globally significant teaching and research that is simultaneously contextually grounded. The Faculty contends that teacher

education and development should be steeped in local challenges and provide pre-service and in-service teachers and other educational practitioners with the tools to deal with the demands of a fast-changing world, which is increasingly driven by technology. Diem and Helfenbein (2008), view conducting artful facilitation that promotes critical thinking as one of seven skills, practices, and dispositions of activist social-justice education. Thus, quality teaching is a matter of social justice, and coherent modules constructively aligned and informed by data-driven decisions serve a similar purpose.

Through this project, I worked towards helping lecturing staff develop a deeper understanding of data-informed learning design decisions by considering variables that can influence student success. This placed the student at the centre of learning design as student engagement data and associated indicators revealed through their patterns of use became more widely understood. Paying closer attention to student patterns of engagement and student success in the design and delivery of the curriculum resulted in more socially just teaching and learning. Students enter various learning spaces from a diverse set of contexts that impact the level of their success. During the period of remote and online teaching and learning, typical issues influencing student engagement patterns can be attributed to environmental variables such as geographical location, network coverage, device sophistication, conducive learning environment, and student mobility. Other well-documented affective variables comprise resilience, motivation, peer support, content relevance, feedback loops, academic confidence, and a sense of belonging.

METHOD

A flexible learning design template was first introduced in 2020, refined in 2021 and applied to all undergraduate modules in 2021. This template was designed to address the lack of structure observed in various modules in the Faculty and to bring about a consistent approach to teaching and learning whilst allowing individual lecturer creativity to shine through when crafting various learning activities. The pre-set design was created to customise the look and feel for all initial teacher education modules in the Faculty, as depicted in Figure 1.

Creating and prepopulating this flexible design module template with generic and faculty-specific information ensured a uniform approach to faculty matters, thereby reducing lecture load. The onboarding of new lecturing staff was thus benchmarked against existing standards. Using such a detailed template further allowed for comparing student engagement data across modules leading to early identification of modules at risk.

The main aim was to promote staff reflexivity in developing their modules that allowed for a seamless transition for students between modules. Students felt more secure when accessing their modules. They could navigate directly to needed information, reducing the total cost to the end-user by reducing the data load and time spent online.



FIGURE 1: FLEXIBLE LEARNING DESIGN TEMPLATE - MODULE NAVIGATION PANE

A self- and peer-review instrument was developed in consultation with lecturers to accompany the flexible learning design template to determine module readiness. Each module was self- and peer-reviewed before being released to students. A module audit of 147 undergraduate modules along set criteria was conducted and cross-correlated with the module self- and peer-review results. In cases where modules fell short of the set parameters for release, individual consultations with lecturers and HODs were arranged, and support was provided. Based on these results and the need to make more data-informed decisions in the design of modules, several areas were identified and developed as a series of 10 staff development workshops.

Topics included:

- Revisiting and revising the flexible design module template and self-and peer-review instrument.
- Introduction to analysing test data.
- Application of test data analysis to improve teaching and test design.
- Constructing/ developing rubrics and drawing consolidated rubric evaluation reports to improve student support to target areas for improvement.
- Qualitative developmental feedback and use of generic exemplar feedback.
- Emerging learning technology applications with immediate feedback loops such as quizzes and automated tests.
- Simplified learning analytics – Drawing learner management reports to learn more about student engagement.
- Considerations in designing and assessing group tasks.
- Crafting learning design principles to reflect module coherence.
- Showcasing a range of exemplary BB modules making good use of learning design principles informed by learning analytics.

Over six months, 72 lecturers regularly attended these sessions, with an overall participation total of 324. Additional just-in-time support was provided to assist lecturers as they started implementing data analytics principles in their environments. During the last session, exemplary modules that were highly rated

during the module audit were presented by individual lecturers. Showing, telling, and theorising are almost as important to bring about a deeper level of learning as the actual learning in a development programme. During this showcasing event, lecturers shared their module design decisions. They reflected on the evidence they used in the design process and the development of specific learning design resources, tools and activities. This very impactful last session allowed lecturers to learn with and from each other and achieved the objective of making the design process more visible, explicit and sharable. Analysis of module data indicated a slow yet systematic uptake of lessons learnt during these sessions.

OUTCOMES

This intervention directly impacted the quality of teaching and learning by enabling lectures in the Faculty of Education as teacher educators to be more responsive to their students' learning context. As they studied student engagement by drawing course evaluation reports and interrogated assessment results, they became more familiar with student patterns of engagement and particular indicators associated with student success.

Wide consultation in the self- and peer-review instrument design established a common understanding of what learning design and module coherence entail and determined the standard of module readiness. Robust conversations about learning design thinking and module readiness lifted the standard of module design, leading to more constructively aligned modules.

Having to explicitly articulate learning design principles to inform curriculum module development allowed teacher educators to share their learnings and insight into curriculum development. It also helped to frame their reflection of their practice as part of their professional development whilst using a shared set of indicators to judge student learning data and thus advanced their scholarship of teaching and learning.

As a result of this project, I anticipate that lecturers as teacher educators at the University of Johannesburg will be more willing to share their pedagogical design decisions. In future, they will be able to explicitly articulate their design decisions based on sound learning design principles informed by student learning data to account for more socially just teaching and learning.

REFERENCES/READINGS

Conole, G. (2012). *Designing for learning in an open world*: Springer New York.

Diem, J., & Helfenbein, R. J. (2008). *Unsettling beliefs: Teaching theory to teachers*: IAP.

Siemens, G. (2013). Learning analytics: The emergence of a discipline. *American Behavioral Scientist*, 57(10), 1380-1400.