

CASE STUDY K: Personalised pathway planning at Open Universities Australia

Open Universities Australia (OUA) is a higher education consortium owned by seven Australian shareholder universities to provide distance education. Several other universities and organisations have formal links with OUA. Study materials may be entirely or partly online, or with a mix of print, CD and DVD. Undergraduate, postgraduate and vocational qualifications are offered as modular courses. Students can choose how many units they study at the same time, offering flexibility to those who want to study alongside work and other commitments. Planning a route through the modules necessary for a qualification can be complex, and the Personalised Adaptive Study Success (PASS) initiative was set up to help students identify pathways appropriate to them.

Key takeaway points

- » PASS aims to personalise the study experience for each student, especially the path through the curriculum
- » The overall learning outcomes may be achieved in multiple ways, so a student who struggles on a module may have extra learning activities or alternative next modules recommended to support their learning
- » A combination of statistical and qualitative data is drawn from the student profile, learning profile and curriculum profile. Semantic rich data from discussion forums and responses to open-ended questions is included
- » Dashboards are provided for students, facilitators and instructional designers. Each dashboard can be customised by selecting tiles with different functions relevant to the role
- » A major challenge was the analysis of fragmentary data from multiple sources. Each item of information may have contextual idiosyncrasies and interact with other information in multiple ways.

Rationale

The central idea behind PASS is personalisation of the study experience for each student, especially in terms of their path through the curriculum. The aim is to support struggling students by suggesting alternative modules, more appropriate to their needs, as well as offering support. Each student may have a different route through the same subject area, but provided they satisfy the requirements of the course as a whole, they can gain the qualification. Students at risk are identified through learning analytics.

In a traditional linear path through the curriculum, poor performance on one module impacts upon student outcomes for subsequent modules and a struggling student may not have an opportunity to catch up with the rest of the cohort. In contrast, PASS supports a personalised and adaptive learning path. The overall learning outcomes for the qualification may be achieved in multiple ways. So a student with a weakness in a particular topic can study extra modules to strengthen that area before re-taking the original module. Or, there may be an alternative path to achieve the same learning outcomes through a different set of modules. The PASS system is dynamic, recommending an alternative study path at any point where the student is deemed to require help.

Data sources and indicators of engagement

PASS draws upon data from a wide range of sources, including customer relationship management systems at OUA and partner universities, the learning management system and the curriculum profiles for each unit and program. In essence, the analysis is based upon three profiles:

- » The student profile - location, socio-demographic factors, prior knowledge etc.
- » The learning profile - use of online content, assessment, online forums etc.
- » The curriculum profile - requirements of the unit and program, alternative paths etc.

A combination of statistical and qualitative data is analysed by the learning analytics engine, which feeds into the reporting engine and into the personalisation and adaptation engine (producing recommendations and other feedback for students and tutors). This is intended to enable intervention at the micro, meso and macro level, for example, suggesting an extra mathematics module to a student or providing evidence for redesigning a section of the curriculum.

The PASS framework uses the output from a learning analytics engine to inform a personalisation and adaptation engine, and a reporting engine. The personalisation and adaptation engine feeds recommendations for content and activities to the student dashboard in the online learning environment.

Dashboards and interventions

PASS provides dashboards for students, facilitators and instructional designers. The student dashboard can be customised by adding and moving tiles. These tiles include: self-assessment, the overall performance of the student, a social media feed, recommended activities, predictive course mastery and dynamic content recommendation.

The facilitator view includes a list of students who have not recently been active online, a visualisation of current discussion topics in the online forums, the current usage of the learning environment, the number of assignments submitted and a cluster chart identifying at risk students. Facilitators can customise the interface by selecting different functions to display.

The instructional designer view shows student satisfaction and engagement with the learning materials, alignment of student behaviour with learning design throughout the module and enables reports to be generated based upon pass rates, students at risk and other factors.

Findings and outcomes

PASS has been implemented at OUA and is embedded within their online learning environment and support systems. One of the conclusions of the project is that the preparation of stakeholders for applying insights from learning analytics in a meaningful ways is vital. It was also noted that limited access to educational data was a disadvantage for stakeholders. The dashboards were designed so that stakeholders could customise their own interfaces, in order to better fit their requirements.

A major challenge for this project, and the wider use of learning analytics, is the interaction and fragmentation of information as well as its contextual idiosyncrasies, which problematise the establishment of a learning analytics framework. The models combined numerical and qualitative data to build a more rounded picture of the learner's situation. In particular, semantic rich data from discussion forums and responses to open-ended assessments, for example, enable a better understanding of learners' knowledge and needs.

References

Ifenthaler, D. (2014) *From educational data mining to automated analysis of semantics*
<http://documents.epfl.ch/groups/m/mo/mooc-admins/www/documents/Ifenthaler-LAW.pdf>