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Analytics for Action: using data analytics to support students in improving their learning outcomes

Innovative impact

Regularly accessing and discussing the data has enabled academic teams to introduce changes in presentation (and/or for following presentations) of modules across the University, aimed at improving student outcomes. It has also provided useful information on design issues appearing often in our modules. By sharing these findings widely, TEL Design is able to inform stakeholders of design good practices based on evidence, contributing to better design standards.

In the long term it is expected that the use of data analytics to continuously improve student outcomes will be the standard, as more complete data sets and better data visualising technologies become available and more affordable. All institutions will create and develop dedicated teams to work in this field. They will need to develop staff skills in working with data, within the context of data analytics.

Introduction

Data Analytics are now everywhere. Most industries are using the customer data they collect to gain intelligence and insight into the preferences and aspirations of those customers. Organisations in the public and private sector are using analytics to measure and improve their processes and outcomes. Professional sports are a good example. Almost all teams in top leagues are now using data analytics to inform their decisions, with recent examples of non-favourites teams winning top competitions when data analytics was used systematically. Higher Education is not an exception. The increased use of Virtual Learning Environments as the main vehicle to deliver content to students has provided an unprecedented access to large datasets (Arbaugh, 2014) on the interactions of students with the different pedagogic activities provided online. Understanding these interactions is perceived as a powerful tool to enhance the design of online modules and to provide targeted support to students, helping them to improve their learning outcomes. Greller and Drachsler, (2012) have considered additional dimensions required for a holistic approach to the use of learning analytics, including users and processes. At the Open University the Technology Enhanced Learning Design team is working closely with academics to improve student outcomes by introducing data-informed, evidence based changes in presentation, using a specifically designed framework known as Analytics for Action (A4A)

Analytics for Action

Based on the Analytics for Action evaluation framework (Rienties et al., 2016), the Open University Learning and Teaching Centre ran a two-year Analytics for Action (A4A) pilot aimed at enabling evidence-based change during presentation. This was part of a wider project that included Real-time Student Feedback, Student progression reporting, Ethics and Predictive modelling (OU Analyse). At the end of the project, the University decided to implement A4A as part of the ongoing efforts to support students and help them improve their learning outcomes. TEL Design was selected to run the process as its staff are specialists on providing an evidence-based focus on student outcomes. The team are also familiar with the design so it provided a natural long-term home for Analytics for Action. Using data analytics became a mainstream activity.

Support and Training

Different levels of support are available to academic teams looking at a specific module, ranging from a dedicated team mailbox to a full

References

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support scheme which includes data support meetings, comprehensive reports and recommendations on possible actions based on documented good practices.

TEL Design and the Faculties work together in the selection of the modules that will receive full support. The final decision, informed by TEL Design, resides with the Faculty. Based on previous experience, the current Selection criteria goes beyond modules perceived as underperforming in the Annual Quality Review and include new modules, modules with particular pedagogic challenges and/or innovative approaches, modules with high student population, and modules included in key qualifications.

Data support meetings are chaired by Senior TEL Designers (STELDs), who bring a wider view as they are exposed to data covering a range of modules and are aware of the design features. Academic staff attending provide a more in-depth knowledge of their modules. Both groups review the data and agree on the issues to be investigated. STELDs may suggest actions from the options available (Rienties et al. 2015) and follow up the implementation. STELDs also prepare comprehensive reports on discussions and agreed actions. These reports are stored in a shared area and are available to Faculty staff. Faculty stakeholders also receive a summary report with key indicators

Common themes investigated at the data support meetings are:

a) Student profile: including demographic and qualification profiles

b) Concurrency: number of modules and credits being studied concurrently, potential clashes at assessment points, alignment with qualifications design and Faculty advice

c) Assessment submission rates: proportion of students submitting each assessment, unexpected rate drops between assessments, average scores, impact of extensions and correspondence with assessment strategy, comparisons with similar modules

d) Withdrawer profiles: who are the students who withdraw, which qualifications are most affected, which groups are more affected

e) On line engagement and tools and resources usage: overall access to the module website, use of specific VLE tools and resources featured in the website, frequency and timing of visits and alignment with design elements, specific tool reports on engagement and formative assessment via electronic quizzes

f) Retention: formal rate of students still registered in the module, passive withdrawers, sudden or accelerated drop rates and correspondence with module design and/or contents

g) Pass and completion rate: historical trends and comparison against similar modules, comparisons against predicted results

The data reviewed at the Data Support Meetings and the corresponding report often result in further and deeper conversations covering wider aspects of the data and in relation to Module Design,

leading to more in-depth questions beyond the specific module reviewed.

TEL Design also offers regular and ad hoc training sessions that enable staff to get started in using readily available data on their module(s). These training sessions cover the A4A evaluation framework, the Active Presentation Toolkit and the Data sources. The sessions are mostly a hands-on experience in which the users review data relevant to their module(s), helping them develop their data analysis skills with personalised support from instructors. While the contents of the training are in essence the same, ad hoc training sessions are often adapted to meet the specific requirements of the audience.

Active Presentation Toolkit

TEL Design maintain and update the Active Presentation Toolkit, a website available to OU staff containing step by step instructions for running an active presentation, using the data available. It includes the staged process suggested in the A4A evaluation framework a template to capture results, reference documentation, a description of tools available, links to the various data sources as well as to existing case studies and related papers at the Evidence Hub.

Actions and Feedback

A number of actions were taken after the discussions held at the Data Support Meetings with measurable positive impact in some modules across the University. (Evans, G., Calder, K, & Hidalgo, R., 2017). Additionally, discussions held at those meetings have led to the identification of common issues impacting student outcomes, including workload issues, knowledge or skills gaps, retention and community and collaboration difficulties. (Jones, E., 2017)

Feedback has been received from different stakeholders through formal (surveys) and informal channels (email) and has been overwhelmingly positive for both the Training and the Data Support Sessions. Trainees have found the trainers *"were able to support individual learners with their unique issues"* and the sessions were *"Hands-on appropriate support and guidance using real live data".* To the statement "Overall, I am satisfied about the training session", 56% - 25 out of 45- of the respondents replied "Totally agree", while a further 42% replied "Agree".

Attendants to the Data Support meetings expressed they were "able to go "off grid" and actually – finally! – get some insights and answers into presentation questions we have had for ages". They also mentioned that the session gave them "something to think about for the future presentations"

Conclusion

Positive feedback and increased awareness about learning analytics have resulted in an increased demand for the support available via the A4A programme. Modules supported have grown from 29 in 2016/17 to 52 in the current year. Students reached have also increased from over 25,000 to over 38,000 in the same period and staff trained – mostly academic and academic related staff- will double from 75 to over 150. This increase in the level of engagement across Faculty staff is essential for the deployment and efficient use of data analytics as a tool to support and improve student outcomes. While the quality and reach of the data sets, as well as the technology used to visualise data are key elements to consider, the success of the initiatives using data analytics will depend largely on the staff involvement and ownership. No institution will be able to afford ignoring the evidence from the data, without losing competitiveness in the future. Data analytics will be business as usual for all stakeholders involved in module production.