myday

The importance of student analytics & data in higher education, a new age of research.

Introduction

What do we mean when we talk about higher education data?

The sector collects, generates, uses and reports on an enormous range of data each year, and, in a big data world, is increasingly doing so in larger volumes and with higher velocity.

Data has always been a significant asset for institutions and has been used to inform their day-to-day operational decisions as well as longer-term business and strategic decisions. To take a common example, creating the timetable for each semester requires drawing on a range of different types of data across the institution.

To work out how many lectures, tutorials and labs to schedule per module, the timetable will need to bring together information about student enrolments in the module, staff numbers in each faculty (including staff with the relevant expertise/qualifications to lecture or lead labs) and estates data on rooms available with the necessary capacity and any equipment required.

There are many types of data to consider including:

- Timetables
- Administrative
- Apps & Admissions
- Research
- Financial
- Maps & Facilities
- Student Performance
- Staff Performance
- Course & Module
- Alumni

How is data used?

Data is utilised to inform senior leadership teams and business management planners when making executive decisions with regards to finance and growth within an institution. Plans can be influenced by all types of data, both internal and external. External major data collectors such as HESA, UCAS, SLC and UKVI are good resources to supplement the research and findings from an institution's decision makers.

1 Bettering the quality of teaching and assurance

Understanding what resonates with students has influenced an institutions way of working and improved teaching methods for decades. Teaching staff often use data to improve their own practices, whilst establishments use learning analytics overall as a diagnostic tool at both individual and systematic levels.

Student performance measurement needs to be a priority across all departments. Whether it's marketing, the senior leadership team or technical individuals, understanding how to utilise the data you have available to you to improve teaching methods and institution-wide processes can streamline workloads and create a more efficiently ran university.

Quality assurance can further this efficiency. Understanding how a different year group, area of campus, subject of study or demographic of student are best communicated to doesn't just build trust, but builds a campus community which will in turn raise engagement and retention figures.

It's important to focus on devising Key Quality Indicators (KQIs) that will drive improvement; and initiate quality assurance tools that will help you to make better judgements about the standard of education and training you provide. It's also important to have a clear and concise understanding of how these help you make judgements against your key objectives.

2 Analysing data to improve student performance and trends

Student data, also known as learner analytics, is the process in which data about a student's characteristics and learning behaviours are gathered and analysed to further understand the environments and scenarios in which a student's performance will be of optimal level.

The UK is behind globally on the development and implementation of learning analytics. While some institutions in the US are using advanced and innovative technologies, the UK HE sector has barely begun to explore the potential of learning analytics.

According to a survey conducted by the Heads of E-Learning Forum (HeLF) in June 2015, nearly half of UK HEIs have not implemented learning analytics at all, with just one institution responding that learning analytics were fully implemented and supported.

Many organisations are looking to implement learning analytics systems in order to improve the student experience. This includes enhancing achievement, reducing the number of exam or module resits, providing better feedback, and empowering students to become more reflective learners.

Retention is currently the major motivator for UK institutions looking to implement learning analytics systems. This is particularly key in the current financial climate, where tuition fees form a significant part of institutional income and losing a student (and their subsequent fees) can have a significant budgetary impact.

Data on how a student is interacting with their course and their institution can be an indicator as to how engaged the student is, and subsequently how likely they might be to drop out. For example, a student who isn't logging into their VLE or going to campus is likely to not be engaged with their studies and might be at risk of not completing their course.

Student apps and platforms such as myday allows institutions to connect disparate and not just join student analytics from any single department but merge all information institution-wide. By doing so, a truly holistic view can be achieved to understand student performance and trends.

3 Understanding behavioural learning

Across the world, many organisations are realising the significant value of big data and using data analytics to improve business. For example, the use of Clubcard's allow supermarket chains to collect an enormous amount of data about their customers. This is used to not only target individual shoppers – through personalised newsletters and offers – but also to inform a much broader strategy, such as which products would be best placed close to each other or which products should be next to the checkouts or the entrance.

Tesco for example, are also using this data in predictive analytics to forecast how many products will be sold when and where. For example, combining weather data and sales data allows Tesco to predict what types of food are most likely to be purchased during heatwaves, leading to significantly less food wastage as well as cost savings. They also analyse data about how their in-store refrigerators are operating in order to maximise efficiency and make savings.

This approach to behavioural learning can be applied directly to the development of students. If institutions gather information year on year and identify trends within certain time periods, the experience and performance of that institution can be massively improved and streamlined.

One of the motivations for institutions introducing analytics systems is the desire to provide support to particular student groups, such as underachieving students, students from minority groups, and other widening participation groups. Analytics can be a powerful way to identify students who are struggling, and when linking this with demographic data, it can provide insights to particular issues faced by certain groups.

To help prevent students from dropping out, universities can develop an online network which provides specialised advice and guidance to targeted groups, such as online learners or full-time students. It can establish an email and social network service for parents or send alerts to create referrals for undergraduates that are indicating to be at risk of dropping out. Once alerted, the university can then create an intervention plan for the student.

4 Analysing student performance to improve recruitment and access

The positive effects of using retention data to identify students having problems has been well documented. There are examples of universities and colleges that have introduced a comprehensive monitoring system for early interventions, and consequently made a significant impact on student engagement, retention and success.

Identifying modules, programmes and departments with lower rates of retention, progression and completion needs to be supported by action to improve the situation. This approach allows an institution to concentrate limited resources to key areas to maximise the impact of their interventions.

Staff are key to enabling students to participate and feel like they belong in higher education. Responsibility for responding to data about poor retention, progression and completion needs to be devolved to staff throughout the institution. One university found that it was important for staff to accept the data as accurate, then to ensure that staff teams at module level were held accountable for their data, and actively engaged with it. Working together, using data and qualitative feedback, and input from staff and students, they worked to an effective solution that was widely owned and supported.

The importance of staff engagement in the process of change can't be emphasised enough. One college found that greater staff engagement was achieved in part by focusing on student success, rather than on retention. Staff felt the former was part of their academic responsibility, but the latter may be perceived as helping unsuitable students to remain in the system, and thus as ethically or educationally inappropriate.

5 Performance of an institution from a business perspective

Business intelligence allows organisations to gather a vast amount of data on how their business is performing, allows the identification of trends and measures performance over time. Like analytics, this information is often presented in the form of a dashboard, which visualises complex data and allows senior executives and business planners to easily access and review a wide range of information about their organisation.

Although business intelligence systems have been used in the commercial sector for many years, uptake in further and higher education has been much slower. While a business the size of the smallest university will have business intelligence and reporting in place, at the time of writing only around 30 universities are currently using such a system.

Like in the commercial sector, business intelligence can be used to analyse the performance of current business models and identify ways to improve them. This can be used to improve the delivery of modules (using data on staff, income and expenditure, timetabling and room usage, and student feedback), to evaluate different delivery models (such as blended learning approaches using both face to face teaching and distance learning), and to perform a range of other analysis and review functions.

However, getting the data needed for informed institutional planning has often been time-consuming and expensive. Many institutions do not have centralised data warehouses or data management systems, and data is often fragmented across different departments. There are also concerns about the cost of introducing these systems, as many current market options are designed (and priced) for the commercial sector.

Conclusion

What are the possible drawbacks and issues?

Student consent

One of the more pressing issues raised by the introduction of learning analytics are the ethical concerns around students' understanding and consent to the use of their personal data in learning analytics. There is a concern that students might not be fully aware of how their data is being used in analytics, or even that they were generating data, which was then being collected and utilised by their institutions. Institutions have a number of legal obligations when collecting and using student data. Under the Data Protection Act 1998 (DPA), anyone collecting and using personal data must comply with the eight data protection principles, which require that the data be:

1. Fairly and lawfully processed;
2. Held only for specified purposes and not used or disclosed in any way incompatible with those purposes;
3. Adequate, relevant and not excessive;
4. Accurate and kept up to date;
5. Not kept for longer than is necessary;
6. Processed in line with the rights of individuals;
7. Kept secure
8. Not transferred outside the EEA without adequate protection.

Fairly and lawfully processed means that one of the 'conditions of processing' must be met whenever an institution uses personal data. Acceptable ways institutions can use personal data include if the individual consents to the use, or if the use is necessary to fulfil a legal obligation. The DPA also requires that institutions let students know what data they are collecting and how they intend to use it, which usually comes in the form of privacy notice or a fair processing statement.