Introduction

Most medical schools already engage in research that seeks to uncover linkages between learning and teaching activities and student performance. The increasing use of Learning Management Systems, and ICT generally, along with the upsurge in social media activity means that there is a corresponding explosion of learner activity data. The emerging field of learner analytics can be applied to medical education. This poster seeks to document our steps towards using learner analytics in the Griffith School of Medicine.

What is "learner analytics?"

The following definition gives a concise coverage: “Learning analytics is a field of research, collection, analysis and reporting of data about learners and their contexts, for purposes of understanding and optimizing learning and the environments in which it occurs.” 1 Figure 1 gives some examples of the processes that can occur in learner analytics.

Why do it?

Not every learner is the same

Learner analytics allows us to identify the range of students in a program. Of particular interest are correlations between activities, behaviours and attitudes with measurement of progress and performance. It therefore has the potential to:

• Identify at-risk students and design remedial and preventative interventions
• Improve retention
• Provide learner-centric feedback to empower learners
• Inform the development of adaptive learning / intelligent tutors
• Improve selection criteria used in admission processes

Staff can benefit too

Learner analytics provides metrics that can augment university-wide student surveys. It therefore has the potential to:

• Support performance reviews
• Provide evidence for probation and promotion applications

Problem and Considerations

Comments and Lessons learnt

Activity data collected digitally, although precise, may nevertheless have limitations on what can be inferred

This can lead to erroneous conclusions, especially with lack of context. E.g. a student may click a resource link but did they read it? E.g. Does quantity/ frequency equal quality in a forum discussion?

Difficult to foresee what data will be fruitful

The perennial research problem. Try to measure an aspect comprehensively e.g. track usage of all resource types, not just the easily measured ones. Conduct preliminary studies to identify corollary “hot spots” and measure these well

Individual research interests versus more general concerns

Intra-school collaboration to share research goals and identify useful data

There is a temptation to analyse the data that we have

Digitised quantitative data is analysed “because we can”. Other types of data are often harder to obtain and/or hard to combine. This can lead to bias or incorrect conclusions.

Measure against what?

It soon becomes apparent that effective learner analytics requires a clear idea of curriculum - one that can be codified and represented systemically. At Griffith, much of the curriculum has been described in a database in the form of learning objectives, themes, PBL blocks etc.

Although systems can collect qualitative data, it is more difficult to summarise, analyse and combine

Qualitative data will always require human interpretation, but keyword recognition algorithms offer promise that qualitative data can be integrated

Online data collection is not always the best way

E.g. paper survey at end of lecture may provide more and better responses than online survey

We are drowning in a sea of data

School faculty and leadership need to be convinced of the value of learner analytics. Good analysis requires investment in staff with appropriate skills.

Privacy and ethics concerns

E.g. it is a gross invasion of privacy for teachers to know what students are doing and engaging in, as defined by the school’s policies. This data can be profitably used by students for their own benefit, in the context of their career development.

Can lead to a dumbed-down, reductionist view of learning

“... we risk a return to behaviourism as a learning theory if we confine analytics to behavioural data” 2

May actually result in poorer experiences for students

E.g. an economic or business decision could be justified using learner analytics which has indicated a neutral or even positive learning value, while where the analysis is deficient due to incomplete data or wrong modeling.

Meaningful data and analysis often requires linking of data to individuals, and individuals within groups

Requires users to be authenticated when using online systems. Also need to design database relationships to cater for group activities. Establish a means to track students’ progress through program e.g. repeated years, leave of absence.

Off-the-shelf solutions are not necessarily focused on learning and pedagogy

More likely to be focussed on business propositions. Bespoke solutions may be better but likely to be more expensive.

Increased measurement is not enough, there needs to be a translation into action leading to improvement

A culture of continuous improvement and feedback to students and staff is vital. One example of successful use of learner analytics at Griffith is the gathering of student perceptions of achievement of learning objectives which is fed into the continuous improvement of PBL cases. 3

Conclusions / Where to from here?

We believe that medical schools should consider current developments in learner analytics and carry out appropriate planning and system development, to maximise the benefits and minimise the problems that this field affords to both students and staff. At Griffith we have identified the following areas of interest for further investigation:

• Development of collaborative efforts so that cross-institutional comparisons can be made (e.g. agreed measures)
• Efforts to extend analytics for the direct manipulation and benefit of students
• Monitoring the trend in self tracking (e.g. phone apps) by students (e.g. Quantified Self project)
• What are the best data visualisations to communicate results?
• Establishment of principal indicators against which to evaluate educational interventions, and consideration of the underlying rationale for learner analytics - is it to measure success in terms of quality and quantity of graduates, or success in lifting more students a longer distance during the program?

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Figure 1: A map of learner analytics concepts and potential outcomes