

EVALUATING ENGAGEMENT TO ADDRESS UNDERGRADUATE FIRST YEAR TRANSITION

A Case Study

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Abstract: Rapidly changing demands from employers of students of business meant substantial redesign of the first year undergraduate experience whose underlying pedagogy drew on the concept of “high-engagement” learning. This paper focuses on the question of how engagement can be evaluated. It is argued that a variety of “sensors” are needed for evaluation, both quantitative and qualitative. Of particular interest is the use of Moodle logs as an emerging powerful sensor.

1 INTRODUCTION

Nicol (2006) summarises the particular importance of the undergraduate first year and relates it to the use of formative assessment, which, he argues has considerable potential to enhance students’ subsequent experience.

This case study examines an innovative undergraduate first year core module which explicitly aimed to create through its learning design high levels of student engagement (Cass Business School, 2010). These high levels were planned to be achieved through the design of learning activities which were both electronic and non-electronic. During the development phase of the project, consideration was given as to how engagement might be measured and evaluated. It was planned at that time to use a mixed method, including a weekly meeting of tutors, and heavy utilisation of the Reports feature of the Moodle virtual learning environment. A pilot was carried out in a small elective module, and ways were found to track engagement using the standard Moodle reports. But it was also found to be time consuming and to be unlikely to scale.

The assumptions explicit in the design of the module were:

- (a) the transition from high school to university was becoming more problematic
- (b) the core theory of engagement was Chickering and Gamson’s (1987) long-standing framework

- (c) the approach should be based on high-touch as well as high tech (Naisbitt, 1999) through much more extensive and intensive use of the virtual learning environment
- (d) a cross-university initiative in 2010 in learning analytics had highlighted the potential of a data-driven approach to high-touch interaction, and new Moodle analytic facilities specifically for this module were commissioned from the Health Science School learning analytics research team.

2 RESEARCH METHOD

The main body of empirical work undertaken and reviewed here took place over a one year period (2010-2011). The approach taken is participatory and collaborative action research (Stringer, 1996).

The data sources which form the empirical evidence base and that have been used to generate and interrogate theory includes: our own reflexive narratives in response to the developing work; the textual material contained in the online collaboration forums of the module tutors, the Moodle log data of student activities, an online survey of the module tutors, a sample of classroom interaction using personal response systems, and a student focus group.

3 ENGAGEMENT

Although motivation is one important factor in engagement, engagement also relates to the level of achievement. Perhaps the clearest identification of high engagement is from Csikszentmihalyi (2002), who applied his concept of “flow” to the educational process. Astin (1993) reported that student engagement is a key predictor of success in higher education. Krause (2003) in turn suggested that effective first year engagement involved students in self-reflection in their first year at university. The decision in the case discussed to move from earlier VLEs was connected with a move towards greater student engagement (Holtham & Courtney, 2006).

Kearsley and Shneiderman (1999), taking a technology-orientated perspective, argue for engagement theory as a basis for the use of new technology to make new approaches possible. In the event, the high-level group gave most weight to Chickering and Gamson’s (1987) principles of good practice in undergraduate education. These are in effect a manifesto for a high-engagement approach to learning, as opposed to a scientific framework.

1. encourages contact between students and faculty,
2. develops reciprocity and cooperation among students,
3. encourages active learning,
4. gives prompt feedback,
5. emphasizes time on task,
6. communicates high expectations, and
7. respects diverse talents and ways of learning.

A decade ago, we anticipated that proactive use of a virtual learning environment would naturally promote high engagement. Sadly, as identified by JISC Digital Media (2011), much use of virtual learning environments, including Moodle, is simply as a content repository and assignment uploading facility (Lane, 2009).

This narrow use is perhaps particularly disappointing in Moodle, whose espoused philosophy is avowedly social constructivist (Moodle.org, 2011), embodying a change in role of teacher from away from purely being a source of knowledge. A text on Moodle as a business (Henrick, Cole and Cole, 2011) stimulated in us the conception that a VLE such as Moodle also had the potential to provide the engine for a workflow system, which could be used educationally.

The development of the module, drawing together three separate modules was a complex task and a fluid working group structure was developed

to ensure that as transparent an approach as possible was taken to design and implementation. The design team included an experienced learning designer at professorial level who operated as both coach and technical developer throughout the module itself. This was in addition to school and programme-based expertise in e-learning, without which an enterprise of this nature could not have been contemplated.

At the time of selection of Moodle, radical alternatives to a VLE were considered, such as a personal learning environment (PLE) and generic social media. Both of these are still under consideration, but would at the most represent augmentation above the VLE, rather than its replacement.

The technological dimension was deeply embedded in the module design, and symbolised by the phrase high-tech/high-touch (Naisbitt, 2009). One of our ongoing areas of pedagogic research is into generational dimensions of learning and technology (Rich, 2008), and current first year students expect to engage with contemporary technologies within their learning experience.

More particularly, in a first year first term module, there is a particular concern about identifying “at risk” students, who may not in practice be participating, and a strong emphasis was placed on promoting physical attendance and on monitoring participation.

4 LEARNING ANALYTICS

The generic importance of analytics in learning had been brought home to two members of the development team who were in parallel also involved in researching a large scale adult education informal learning project, which was entirely web-based and made very heavy use of web analytics to track engagement of its audience of learners. There was also familiarity in the development team with web analytics being used widely in business. So the team became interested in the potential for moving beyond the minimally featured Moodle Reports, and contact was made with the Health Sciences School of the university where there was expertise in Moodle analytics and in the mining of very large datasets (Jawaheer et al, 2011).

Learning analytics is a very fast growing field, with a lively leading-edge community promoting the sharing of experience and the collective acceleration of both theory and practice (Macfadyen & Dawson, 2010, Brown, 2011. Romero; (2010) outlines eleven distinctive domains of the learning analytics

literature; this paper only relates to three of those areas: Providing feedback for supporting instructors; detecting undesirable student behaviours; and constructing courseware.

A substantial body of work on VLE analytics is beginning to emerge, and some of this (eg Urwin, 2011) is as with ourselves, concerned not simply with retrospective historical tracking, but with what we call “Action Support” that is, with learning quickly and then taking direct action as a consequence with the current cohort of students.

With a primarily face-to-face module, much of the assessment of engagement would need to be based on the two personal observation sensors, physical and digital. Log data has proved to be enormously helpful, but it does not relate to the actual content, eg what is asked or said within a discussion forum. We found difficulties in trying to develop measures for each of the 7 principles. In some ways though tutors felt that they could assess engagement as a whole for their groups, for the individual teams, and to some extent for individual students.

5 RESEARCH PROJECT FRAMEWORK

As the start of the module came closer, it was essential from a research point of view to articulate

the parameters of the research project. The final expanded framework is a layered model (Figure 1, next page), where engagement is measured through a number of “lenses”. The lowest layer is the vast mass of data which derives from unfolding everyday experiences of both students and teachers. This takes many diverse forms - hard and soft; objective and subjective; physical, digital and mental; explicit and tacit; text and non-text, and the amount of such data readily available in digital form has increased considerably. However this increase does not necessarily lead to more information and particularly to more knowledge and insight. Our layered model is built around a number of questions:

What is engagement? We have already indicated our own use of the Chickering and Gamson framework, augmented by the idea of "flow" as indicating an extraordinarily high level of engagement.

About whom can we evaluate engagement? In the context of the present case study, we clearly identified four levels - the cohort as a whole, the 6 tutor groups, the 24 teams and the 120 individual students.

What are the lenses through which we choose to evaluate engagement? In our case, we had identified three lenses - taking the temperature, insight into individuals, and searching for stimuli for process improvement. This is the layer where

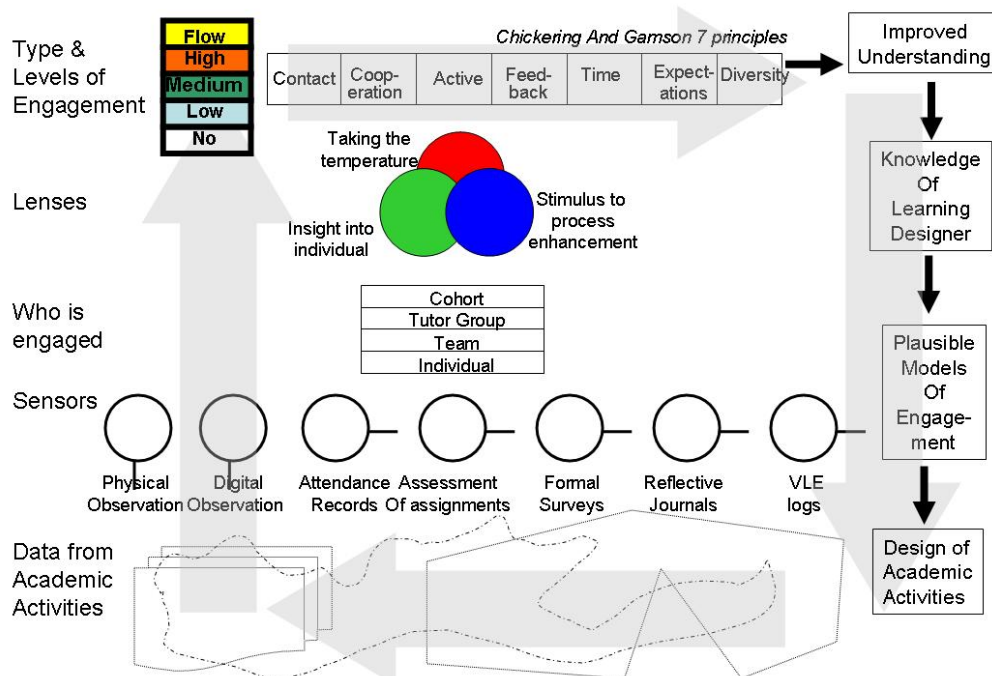


Figure 1: The full framework.

information gets transformed into knowledge, and also where the issue of plausible outcomes is discussed.

In the case study "the seven sensors" for gathering information were identified:

1. Observation and dialogue - physical
2. Observation and dialogue - digital
3. Assessments of student work
4. Attendance records
5. Formal surveys of students
6. Reflective journals
7. Virtual learning environment logs

We also regard sensors 1 and 2, direct observation and dialogue (whether physical or digital), as the "primary" sensors, due to their being able to offer both broader and deeper sensing than the other "secondary" sensors.

In this case study, very extensive use was made of reflective journals, particularly proactive use was made of attendance records, and there was slightly above average use of formal student surveys. For us, the major new sensor were the Moodle logs.

By the start of the module, the three lenses for evaluation of engagement had been decided. Two of these, relating to "overall temperature" and "individual insight" might be found on any module anywhere. However the third, "stimulus to improvement" was a very specific function of being a wholly new module run operated using a variety of features which were distinctive to those involved.

The improvement lens potentially applies to any of the levels of measurement, while the other two relate to overall and specific levels respectively. Moodle's constructivist philosophy and emphasis on learning communities makes it relatively weak in organising reports by tutor group and team, and much of the measurement customisation effort related to generating "temperature" level reports.

Even within a single module, student engagement can and perhaps should be defined in a wide variety of ways. Despite the intrinsic difficulty of measuring engagement, the course team was able to identify five broad categories representing levels of engagement. The highest and lowest of these were fairly straightforward to identify, the highest drawing on the concept of "flow". Whether in group or individual work, it is generally not difficult to observe flow. It does not mean all those with the highest marks achieve flow - flow relates also to fulfilling potential. A modest student may more than fulfil their talents if they can achieve flow. A strong student may get excellent marks without flow.

At the lowest level, non-engagement is a student who rarely if ever shows up physically, rarely or

ever contributes online where the contribution is voluntary, and often shows a lack of understanding about even when and where the module is taking place or what resources need to be consumed.

6 ACTIONABLE INTELLIGENCE

Regardless of the type of institution, learning analytics almost encapsulates or symbolises a move from a medieval (or at best nineteenth century) lecture-based transmissive approach, to one that embodies the idea of the academic as a facilitator of learning, using a breadth of media both physical and digital.

Good data alone is not sufficient: it needs to be disseminated to the right people and to feed into decision-making. Learning Analytics cannot be divorced from the ongoing organisational pressures and time shortages, and is most likely to be used if it feeds into worthwhile actions (Campbell et al, 2007).

We also need to recognise that a trace is not the same as the object or experience that made the trace. Furthermore, some students prefer a static version of resources due to their learning styles and time management approaches; adding new links and resources is not seen as beneficial by all.

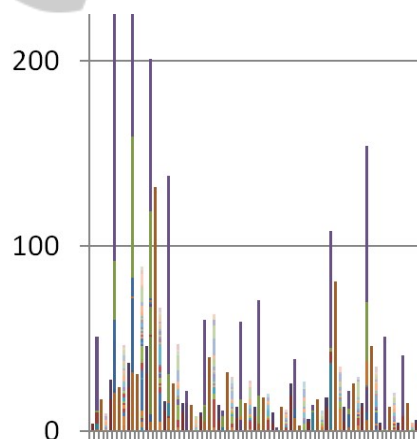


Figure 2: Custom learning analytics: individual student cumulative graph.

Actionable intelligence – Taking the temperature

This involved daily participation statistics that showed low usage, which caused concern and led to development of a new mandatory Moodle "lesson".

Actionable intelligence – Continuous Improvement

Even basic Moodle reports enabled us to track

the views of each resource. An “activity report” on library resources showed there was a good immediate take-up for some sources. But Business Source Complete, the key database resource, had hardly been looked at, and this was the impetus for urgent creation of a library discussion forum.

Actionable intelligence – Individual insight

The course team was preoccupied with students making zero or very low contributions, both in general and for specific online resources. A Moodle report was used to identify students who had never accessed the FAQ Forum, which we regarded as a key indicator of engagement. Tutors used this data to follow up with their own tutees in the “at-risk” group the question of non-participation. Figure 2 represents a custom report on individual student activity, produced via direct access to Moodle logs, rather than via the standard Moodle reports.

7 CONCLUSIONS

After the end of the module, we reviewed how far the 5 levels of engagement (no, low, medium, high and flow) might inter-relate with the 7 sensors. The interest was in how different sensors were able to support the evaluation of different levels of engagement. This opens the possibility of a dashboard to support learning design relating to engagement. The results are shown in Table 1.

Table 1: Sensors related to engagement levels.

		Sensors for individual engagement						
		Physical Observation	Digital Observations	Attendance Records	Assessment of Assignments	Formal Surveys	Reflective Journals	VLE Logs
Engagement Level	Flow	+	+		+		+	
	High	+	+		+	+	+	
	Medium	+	+		+	+	+	+
	Low	+	+	+	+	+	+	+
	None			+	+			+

It is well understood that attendance records are a very limited tool for assessing engagement. But they are quite a powerful and easy to use tool for picking up non-engagement. VLE logs are also useful in measuring zero and low levels of engagement. But simply accumulating clicks in the VLE rarely related to the highest level of engagement. Indeed some of the students with extremely high levels of VLE used appeared over-anxious in their approach generally. Some concluding reflections were:

1. We combined both computer and non-computer based evaluations of engagement eg tutor's opinion, as done in any module
2. We have extended this, both by the design of

the VLE and then the use of basic plus enhanced metrics using VLE activity logs and we have used other electronic methods such as survey and clickers.

3. Our focus on evaluating engagement has helped us to redesign learning activities within the module, better to address Chickering and Gamson’s definitions of engagement.

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