NPF
NATIONAL PROJECT FUND
AKO AOTEAROA

Research Report

Help or Hindrance: blended approaches and student engagement

Lynn M Jeffrey, John Milne, Gordon Suddaby and Andrew Higgins

AKO AOTEAROA
NATIONAL CENTRE FOR TERTIARY TEACHING EXCELLENCE

Dr Andrew Higgins
Ph D. M.Ed. B.Ed St. Dip T.
AH

MASSEY UNIVERSITY
TE KUNENGA KI PŪREHUROA
UNIVERSITY OF NEW ZEALAND

Authors
Lynn M. Jeffrey, John Milne, Gordon Suddaby and Andrew Higgins.

Publishers:
Ako Aotearoa National Centre for Tertiary Teaching Excellence
PO Box 756
Wellington 6140

This project was supported through the Ako Aotearoa National Project Fund 2009, in the Research and Implementation Projects funding stream.

More information is available at http://akoaotearoa.ac.nz/blended-approaches-learner-engagement

Published:
November 2012
ISBN: 978-1-927202-22-7

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Executive Summary

The main purpose of this project was to identify student engagement strategies in a blended environment that would enable teachers to give focussed pedagogical support to enhance learner engagement and achievement. In addition, we explored student and staff attitudes to blended learning. The importance of this research is its system-wide focus in working across tertiary institutions with a number of courses, moving beyond the case-study approach that typifies most of the current research literature in this field.

The project tests a framework of student engagement strategies in a blended learning environment using three types of engagement strategy for: 1) capturing engagement, 2) maintaining engagement, and 3) re-engaging those who have either never engaged or have become disengaged (see Diagram 1 below).

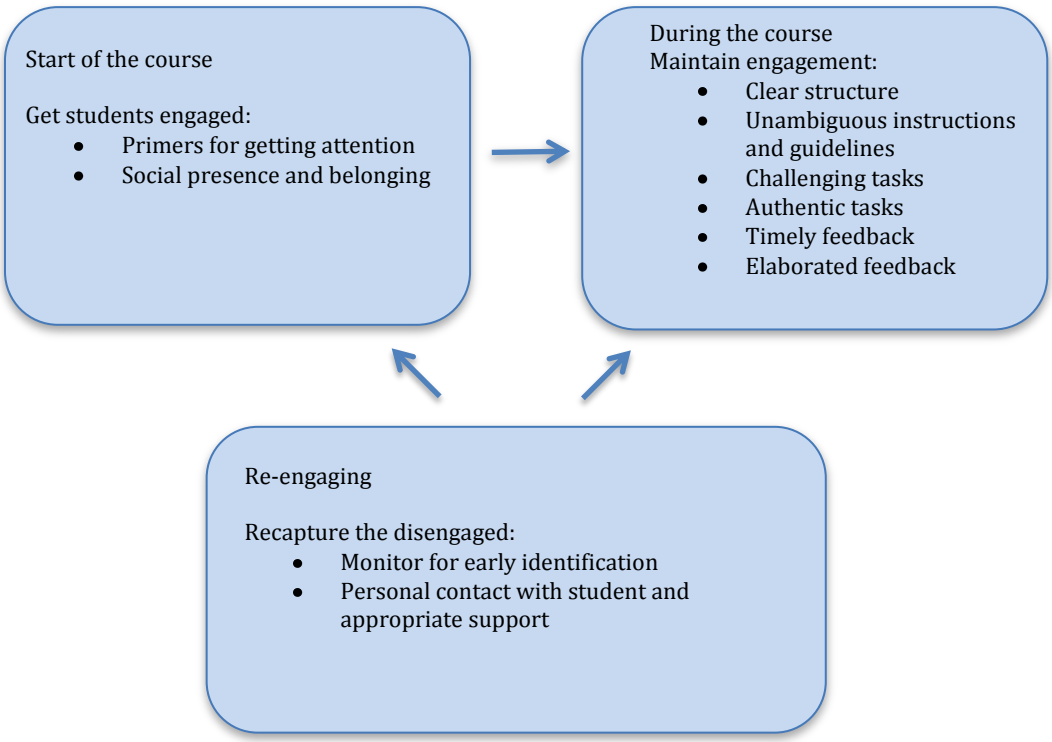


Diagram 1: Engagement strategies

Research objectives

- To identify appropriate engagement strategies in a blended learning context.
- To identify student preference for, and perceptions of, a blended learning environment.
- To determine the effect of blended learning strategies on student engagement and the students' perceptions of the quality of their learning experience.
- To establish the relationship between student learning orientations and engagement strategies in a blended learning context.

- To determine effective methods in a virtual learning environment (VLE) of identifying students at risk of disengagement.
- To develop an integrated toolkit of effective engagement strategies that will help academic staff to scaffold and support student learning.

Literature review

Blended learning is an area that does not have a widely accepted definition in the literature. The project team used the following definition: "at its simplest, blended learning is the *integration* of classroom face-to-face learning experiences with online learning experiences" (Garrison & Kanuka, 2004, p. 96).

It is noted in the literature that there has been considerable reluctance among academics to engage with online learning. This has often been attributed to a reluctance of academic staff to take up online teaching. Over the past 15 years there has been developed a considerable body of research around the factors that encourage and discourage academic staff in the tertiary sector to teach in online environments. Furthermore, given that many academics receive little teacher education or training, the idea of adopting a new way of interacting with students becomes quite daunting.

In the New Zealand context, it might be claimed that many of the issues surrounding blended learning in the western context generally, and in the Australasian region more specifically, are somewhat generic. However, there are very pertinent issues affecting Māori students in New Zealand. A seminal study for the Ministry of Education in New Zealand looked at the implications of e-learning for te reo Māori and kaupapa Māori student learning. The research found that the dearth of literature on e-learning and kaupapa Māori environments makes it difficult to confidently assert what types of teaching and learning practices might contribute to enhanced learning outcomes for students in kura kaupapa Māori settings. However, there were common themes in the literature that suggest how Māori might consider or approach e-learning technologies. The implications for blended learning at the tertiary level are that the limited resources, inadequate IT provisions and cultural challenges at the school level means that some Māori students will be arriving at university with a lower exposure to e-learning than will students from other backgrounds.

Ten essential engagement strategies that have particular potency at critical stages of the semester emerged from the literature. They include:

- **Getting students engaged:** Capturing student attention at the start of the course has the biggest impact on the retention of students as it is in the early stages that the largest number of dropouts occurs. Two major types of strategies were identified as being important:

    1. ***Primers for getting student attention: Curiosity, relevance***
    The literature identifies two possible approaches, *curiosity* and *relevance*. Students experience curiosity when they become aware of a gap in their

knowledge and are motivated to find the answer. One interesting aspect of curiosity is that it grows as knowledge grows, which suggests that teachers may need to prime curiosity early in a course. When students see a subject or topic as having personal relevance, they are more likely to experience an optimal level of arousal for learning.

2. ***Social presence and belonging: Teacher enthusiasm, immediacy and an inclusive environment***
   The social context plays an important role in encouraging student engagement. Students who feel a part of the class and a part of the subject discipline are less likely to feel alienated or isolated and are consequently more likely to become engaged. Teachers, particularly in the online environment, are an important aspect of social presence. Impersonal environments are more likely to alienate students. Teacher immediacy – a sense of the imminent presence of the teacher – is reassuring to students.

- **Maintaining engagement:** Maintaining student engagement through the course requires six strategies:

3. ***Clear content structure***
   When students start a new course, most of the material will be uncharted territory for them. The constants they expect in a course are a clear course outline that includes the content structure and other organisational features. Students become very disgruntled with disorganised courses and changes to the expected programme.

4. ***Clear, unambiguous instructions and guidelines***
   Students are intensely interested in assessment instructions and guidelines. They may experience high levels of anxiety associated with this part of the course, which increases the need for clarity in these matters.

5. ***Challenging tasks***
   Challenging tasks are those that make the student stretch to the limits of their performance. Learning happens when students make an effort; the greater the effort, the greater the sense of achievement and motivation. Students are not motivated when given high marks for simple tasks, nor are they motivated when the task is far beyond their ability.

6. ***Authentic tasks***
   Students are further motivated when they engage in tasks that they perceive as preparing them for the 'real world'. They understand that effort now has a benefit later. Transfer of learning occurs when learning tasks are structurally similar to real world tasks.

7. ***Timely feedback***
   The weight of evidence strongly suggests that in most circumstances immediate feedback is more effective than delayed feedback, as it allows students to correct errors quickly, making learning more efficient.

8. ***Elaborated feedback***
   Studies consistently report that highly specific feedback that elaborates on the ways students can improve their performance results in better learning.

- **Re-engaging students who drift away or fail to engage:** In most courses a proportion of students will procrastinate at the start of the course, or stop engaging, usually at key points such as assessment. The literature identifies two critical strategies for recapturing the engagement of these students:

  9. ***Monitoring and early identification***
     Early identification through monitoring student engagement is essential to recover these students. The earlier the identification, the greater is the chance of success. Ideally, this should start in the first week. Learning management systems (LMS) such as Blackboard and Moodle make this a very simple process. Taking rolls at class is also recommended. Students who are performing poorly are also at risk of dropping out and should also be monitored.

  10. ***Personal contact and negotiated conditions for re-engagement***
      Having identified students who are not engaged, the most effective strategy for re-engaging is personal contact with the student by the teacher. A personal email to each student is one simple option. Follow-up contact for students who do not respond initially is also important. Such contact is most effective when the teacher works with the student to provide help and support for problems the student may have.

Methodology

A mixed-method approach, using both quantitative and qualitative methods, was used to collect and analyse data. Several benefits accrued from this approach. Quantitative and qualitative methods provided different types of answers to the research questions, providing a more comprehensive account of the relationships between the study variables and therefore, a richer understanding of them. A combination of questionnaires, interviews, focus groups and data from learning management systems and student databases were used.

Content analysis was used for the qualitative data and the quantitative data was explored using a range of statistical techniques, including descriptive statistics, paired t-tests, correlations and principal component analysis.

The sample size was 541 from two North Island tertiary institutions.

Findings

The analysis produced sixteen major findings.

Finding 1: Students value blended learning
Students showed a strong liking for blended modes of learning. This was a considerable change as previous studies had shown that traditional modes of teaching (printed materials, lectures and tutorials) were substantially preferred over all other modes. Traditional modes were only marginally more preferred over blended modes. (Data source: Student questionnaire on preference for teaching modes.)

Finding 2: Blended learning may offer a richer learning experience than either online or traditional modes of learning
It is suggested that a blended learning environment, rather than being a compromise between two extremes of traditional and fully online learning, offers the student a wider range of affordances that enhance the learning experience beyond that of either online or classroom modes. (Date source: Student questionnaire on usefulness of blended components to their learning.)

Finding 3: Teachers are the gatekeepers to student experiences
Teachers, through their selection and design of learning experiences, will influence the nature and quality of student learning. What students learn is determined by what they have the opportunity to DO when they engage in the experiences and activities designed by teachers. Student perceptions of the usefulness of such experiences to their learning are strongly influenced by their opportunity to use them. (Data sources: Questionnaire on usefulness of blended components and focus group comments.)

Finding 4: Teachers are more conservative and less enthusiastic than students about embracing opportunities offered by technology
Teachers held deep reservations about the role of technology and had a strong belief that teachers should still be the central actor, with technology playing a minor supporting role. They thought that lectures were useful for explaining theory, and that tutorials provided the opportunity for students to actively engage with the theory at an applied level. Online learning environments were seen primarily as a central repository for all course-related information and its main function was to provide ready access for students. (Data source: Teacher interviews.)

Finding 5: Teachers lack sufficient time, support and resources to create effective blended learning environments
Competing academic pressure for research outputs reduces time for developing online teaching sites. Teachers also felt frustrated they did not have time to learn to use the system properly or to be able to personalise it to reflect their own approach to teaching and learning. A lack of time for development and infrastructural support were also significant inhibitors to developing suitable online experiences. (Data source: Teacher interviews.)

Finding 6: In a blended environment students will engage in a blend of learning behaviours and activities that have personal efficacy and relevance for them

Students choose their own idiosyncratic mix of engagement activities for learning, with some favouring a greater online blend and others more traditional components in their blend. It would appear that while a range of blends might be successful in promoting learning, not all blends are equally effective. (Data source: Correlations between student behaviours, engagements and learning outcomes.)

Finding 7: High levels of engagement and persistence in structured and other learning activities are associated with academic success

The most successful students were those who reported being deeply engaged in structured learning activities designed by teachers. These students were high on planning and persistence, and low on procrastination. They used a wide range of learning resources and approaches, including talking to teachers, collaborating with other students, using additional resources and online forums. (Data source: Correlations between student behaviours, engagements and learning outcomes.)

Finding 8: Levels of engagement are strongly influenced by assessment and online activities such as quizzes

The levels of students' online engagement fluctuated widely during the semester, but generally followed a similar pattern: peaking strongly immediately prior to assessment dates, then dropping sharply. However, this pattern was moderated when online quizzes or activities were used. In courses that included online activities such as quizzes, the level of engagement between peaks was higher and more sustained than for other courses. Teachers reported a steady decline in attendance at lectures, though these also peaked immediately prior to an assessment. Some classes had only 25 *per cent* attendance levels by the end of the semester. (Data source: Patterns of engagement.)

Finding 9: Using the 10 engagement strategies at the appropriate time increases student engagement

The application of the 10 engagement strategies at the appropriate time had a positive impact on the levels of student engagement. Courses that incorporated engagement strategies in their online environment experienced much higher levels of student activity online. We found clear evidence of the efficacy of using specific types of engagement strategies at appropriate stages in the teaching process. (Data source: Relationship between student levels of engagement and the provision of good engagement strategies.)

Finding 10: The greatest potential for improving student engagement comes from using primers

Most teachers did not use online primers to stimulate interest, though most used some kind of priming strategy in the classroom. With one exception teachers did not rate this strategy as very important and did not seem to invest a great deal of time thinking about stimulating curiosity or demonstrating relevance. Changes here would have a significant effect on student engagement at a time when students are particularly vulnerable to dropping out. (Data source: Relationship between student levels of engagement and the provision of good engagement strategies.)

Finding 11: Potential dropouts can be retrieved while they are in the 'zone of discontent'

Teachers who actively monitored engagement and then applied strategies to recapture disengaged students were able to recapture students with relatively little effort. Our results suggest there are times during which some students experience discontent with their studies and become vulnerable to disengagement. However, most of these students can be re-engaged if contacted before making the final decision to withdraw. The key is early identification through monitoring, personal contact and negotiation for a workable solution for the student. (Data sources: Retention figures and teacher interviews.)

Finding 12: Most teachers had well-organised courses with good structures

These online learning sites were well organised and structured. They were divided into appropriate chunks, easy to navigate, followed a logical structure and had clear guidelines and instructions. Students prefer well-organised courses and dislike ambiguity. Carefully structured courses increase student confidence and competence and are an important determinant of a student's tendency to follow a deep or surface learning approach. (Data sources: Evaluation of online courses and teacher interviews.)

Finding 13: Social presence is largely underdeveloped in most online environments

Most online sites had contact details, a welcome message and a discussion forum; however, these tended to be informational and it was hard to get a sense of the teacher from them. Teacher presence is felt as a sense of immediacy and intimacy in the way teachers communicate with their students. Forums were almost wholly teacher-to-student. Student forums are regarded as important for establishing a sense of community. (Data source: Evaluation of online courses and teacher interviews.)

Finding 14: Levels of disengagement in the classroom are of concern to teachers

Most teachers expressed concern at the poor levels of class attendance, some of which were as low as 25 *per cent*. Most teachers attributed this to the provision of online materials, which they believe convinces students they did not need to attend class. Despite this belief teachers feel pressured by student demand to supply these materials. Class attendance is important for academic success. Although tertiary teachers may feel resistant to monitoring attendance, evidence strongly supports its efficacy. (Data source: Teacher interviews.)

Finding 15: About one third of students either dropped out or seriously considered dropping out

By the end of the semester, 15 *per cent* of students had dropped out, and a further 15 *per cent* had actively considered doing so. Teaching quality was most frequently identified as the main reason. These students described their teachers as 'boring' and 'not very good'. (Data sources: Retention figures and student focus groups.)

Finding 16: High dropout rates are associated with higher course grades
As only nine courses were involved, this is a tentative finding. Courses with higher marks had higher dropout rates. One possible explanation is that students who drop out are struggling with either the course work or course load, raising the overall mean marks of the remaining students. (Data sources: Retention figures and course grades.)

From these findings we reached five conclusions:

1. The quality of learning depends on the depth of student engagement in the learning process.
2. The systematic application of all 10 engagement strategies identified in this study give teachers the best chance of achieving high levels of student engagement.
3. The skills and effort that teachers apply to create learning experiences is the single most important determinant of the quality of the learning environment.
4. Teachers are time-poor and lack adequate technical support and training in pedagogical principles.
5. Blended learning can make a difference.

Recommendations

We make seven main recommendations.

National recommendations

1. Much learning and development in the practice of good teaching in a blended environment can be achieved through the creation of a national community of learning for tertiary teachers. Ako Aotearoa already takes a leadership role in this through the Ako Aotearoa project teams and communities of practice, including the Tertiary Teaching Award winners group. Additional contributions could be made:

    a. by hosting the online wiki for tertiary teachers to share teaching and learning strategies, examples and tools for blended learning
    b. by funding further research to measure the effect of engagement strategies both in the classroom and online to student engagement and learning across a broader sample of courses and institutions.

Institutional recommendations

2. Retention has clear economic and reputational implications. In addition to the broader obligations to develop a sense of belonging and social integration, institutions must take leadership in changing a teaching culture in which up to 30 *per cent* of students withdraw or consider withdrawing. A major strategy should be to improve teacher performance and accountability. This could include:

a. developing objective procedures and practices for evaluating teaching practice. Reviews of teacher performance should consider retention rates and success in creating engaging courses that result in higher levels of learning
b. collecting data at the institutional level to identify areas having particular retention problems.

3. Blended learning, when it is the "*thoughtful integration* of classroom face-to-face learning experiences with online learning experiences" (Garrison & Kanuka, 2004, p. 96), can have a powerful effect on student engagement, and through this, retention and student satisfaction. Improving teacher capacity to develop these more sophisticated courses is urgently needed. Teachers need time, resources and support to develop both their skills and their courses. These may include, for example:

    a. workshops to give teachers the opportunity to explore learning technology and/or to develop blended courses, supported by technical staff to minimise frustration and maximise learning
    b. the opportunity to view sample courses that integrate the 10 engagement strategies
    c. providing course templates that teachers can populate with their own materials
    d. time release for teachers to develop their blended learning courses.

Teacher recommendations

4. Teachers should redesign their courses for blended learning, not just add an online component to their regular teaching. The best courses we saw had been thoughtfully considered and the online and classroom components coherently integrated. These courses had been designed starting with a blank slate.

5. Teachers should be strongly encouraged to systematically incorporate all 10 engagements strategies, not just mix and match them, into each course for maximum effect on student engagement and retention.

6. Teachers monitor student engagement online (learning analytics) and in the classroom (taking rolls) for early identification of disengagement. This is essential to improving retention.

7. Blended learning environments should make wide provision to allow students to select their own preferred blend of learning components to foster diverse ways of learning. This carries the proviso that students are given guidance in selecting useful blends.

Toolkit

The toolkit contains strategies, tools and examples to be used for the design of blended learning courses. These are presented in a framework that allows the user to work systematically through the design process, or to select items that have particular value. The design process follows five steps: needs analysis; design of layout and format; development of content; evaluation of the course; and reflection. Central to these are engagement strategies. A wide range of tools and strategies are included to cover the 10 engagement strategies identified in the study. It is envisaged that teachers would use these tools and strategies to assist with the design and development of their own blended courses.

The toolkit is available through the Ako Aotearoa website. The website is in the form of a wiki to encourage teachers to add their own tools and examples for other teachers.

Limitations

The major limitation of this study was the lack of representation we achieved when a major South Island tertiary institution and a wānanga were not able to take part in the data collection because of two separate, major traumatic events.

The study involved nine business courses and so needs to be repeated with more classes in different discipline areas. While the sample size was reasonable, a larger study would give greater confidence to the results.

Further research to measure the effect of engagement strategies both in the classroom and online on student engagement and learning would give greater clarity and confidence to our findings.

Project Purpose

This project identified student engagement strategies in a blended environment that would enable teachers to give focused pedagogical support to enhance learner engagement and achievement. To this end we developed a toolkit of engagement strategies and tested the efficacy of these strategies. The toolkit of strategies supports teachers in selecting a blended approach that best helps students to engage. The importance of this research is its system-wide focus in working across two universities with a number of courses, moving beyond the case-study approach that typifies most of the current research literature in this field.

The project tests a framework of student engagement strategies in a blended learning environment using three types of engagement strategy: capturing engagement, maintaining engagement, and re-engaging those who have either never engaged or have become disengaged.

Research objectives

- To identify appropriate engagement strategies in a blended learning context.
- To identify student preference for, and perceptions of, a blended learning environment.
- To determine the effect of blended learning strategies on student engagement and the students' perceptions of the quality of their learning experience.
- To establish the relationship between student learning orientations and engagement strategies in a blended learning context.
- To determine effective methods in a virtual learning environment (VLE) of identifying students at risk of disengagement.
- To develop an integrated toolkit of effective engagement strategies that will help academic staff to scaffold and support student learning.

Reasons for the project

The project seeks evidence that relates to the efficacy of blended learning within the New Zealand context. By bringing together academic development, student learning and student retention in an investigation into student and teacher perceptions, approaches and engagement in blended learning contexts, it provides knowledge and tools that will enable more effective use of blended approaches to the benefit of students and their teachers. A toolkit provides guidance to teachers to help to enhance learner engagement and achievement within a blended learning framework and it provides students with a more strongly aligned and engaging learning experience. In doing so, it contributes to the international literature and provides a more focused understanding of the nature of blended learning.

Literature Review

Blended learning

The move towards blended learning is a major trend in technology-enabled tertiary education (Bliuc, Goodyear, & Ellis, 2007). This trend is likely to be strengthened with the findings from a meta-analysis from the US Department of Education (Means, Toyama, Bakia, & Jones, 2009), which reported that a blended learning approach resulted in the best outcomes for students. Blended approaches offered opportunities for additional learning time and instructional elements not received by students in traditional face-to-face conditions. The type of media offered to students seems to have only a small impact on effectiveness (Clark, 2001), especially in studies comparing very similar learning situations. It is the selection of *methods* to engage students in the context that is the key part of effective learning (Garrison & Vaughan, 2008). The US meta-analysis (Means, *et al*., 2009) also highlighted the importance of learning time. The more time spent on learning, the better the outcome. This reflects one of Chickering and Gamson's seven principles for good practice in undergraduate education (1987) that was restated for technology by Chickering and Erhmann (1996). The challenge is to support teachers to implement principles of good practice in a blended situation.

Kanuka, Brooks and Saranchuck (2009) describe blended learning as eliminating time, place and situational barriers, while at the same time being able to conduct high-quality interactions between teachers and students. It draws its inspiration from the long-held practices of distance educators who advocate for flexibility of time, place and pace of student learning. Recent research, including that by members of the project team, suggests that the student experience varies considerably and results in variable learning experiences (Jeffrey, Kinshuk, Atkins, Laurs, & Mann, 2006; Zepke, Leach, & Prebble, 2006). This demonstrates a need for more understanding and clarification as to how a blended approach either helps or hinders learner engagement.

A major Canadian study found that the impact of e-learning was different in distance education than in the classroom. Abrami *et al*. (2007) reported that the impact of e-learning and technology use was highest in distance education, where its presence is required (mean=0.80), and lowest in face-to-face instructional settings (mean=0.60), where its presence is not required, suggesting that the principal beneficiaries of e-learning were those with the least access to educational services. If tertiary institutions operated in a single delivery mode only, such as on-campus teaching, then it might be argued that e-learning added nothing to the student's experiences. However, at a time when students all over the world use modern communications technologies, this argument no longer holds.

Among non-distance education institutions, research into e-learning has not advanced as quickly as in those where distance education is more commonly found. For example, Arbaugh *et al*. (2009, p. 71) reported they found that "the volume and quality of research in online and blended business education has

increased dramatically during the past decade. However, the rate of progress is somewhat uneven across disciplines".

Chen, Lambert and Guidry (2010) found that widespread use of the Web and other Internet technologies in postsecondary education has exploded in the last 15 years. Using a set of items developed by the National Survey of Student Engagement (NSSE), the researchers utilised the hierarchical linear model (HLM) and multiple regressions to investigate the impact of Web-based learning technology on student engagement and self-reported learning outcomes in face-to-face and online learning environments. The results show a positive relationship between the uses of the learning technology and student engagement and learning outcomes. Cobcroft *et al*. (2009) noted that blended learning environments that incorporate the physical and virtual are seen as critical strategies for higher education institutions.

Arbaugh *et al*. (2009), like Abrami (2007), found that the most common research streams across disciplines were outcome comparison studies with classroom-based learning and studies examining potential predictors of course outcomes. Results from the comparison studies suggest generally that online courses are at least comparable to classroom-based courses in achieving desired learning outcomes, while there is divergence in findings of comparisons of other course aspects. Nevertheless, one noteworthy finding was that, relative to classroom-based settings, online courses allowed, and even required, reflection as part of the learning process.

Mayes and Morrison (2008) found that it was also crucial to offer a well-managed programme and ensure that faculty members are both interested and competent in teaching in the online learning environment. Swenson and Redmond (2009) suggest that changing from classroom to online learning requires adjustment for both teachers and students.

Using technologies has made access to education wider, broader and, in some ways, deeper than the face-to-face format can achieve. This in itself is significant because it has long been a paradigm of western education that the co-location in time and space of teachers, students and resources is the *sine qua non* of education. The rapid uptake, in educational terms, of technologies demonstrates that new forms of teaching and learning can occur. Changes of this magnitude require large shifts in thinking from academic staff and administrators in education, and particularly in tertiary education, where the lecture/seminar model still dominates academic teaching practice.

Teacher engagement

Anderson (2008) notes that there has been considerable reluctance among academics to engage with online learning. This has often been attributed to the reluctance of academic staff to take up online teaching. Over the past 15 years there has been considerable research into the factors that encourage and discourage academic staff in the tertiary sector to teach in online environments. Furthermore, given that many academics receive little teacher education or training, the idea of adopting a new way of interacting with students becomes

quite daunting. Allan (2007b) argued that using e-learning for professional development will not work if consideration isn't given to two factors: the extra time involved in networked learning and for people new to e-learning to adjust to this type of study.

The significance of the finding is that not only teachers, but also students can become overwhelmed by the new learning experience unless they are coached or have prior experience in it. Given that students often have limited time for studies because of work or other study demands, it is important that staff ensure that students are aware of the dangers. One way to make staff more aware of the demands of online learning is for them to experience it themselves.

Greener (2009, p.267) recognised that making transitions from face-to-face to other teaching approaches carries issues of significant concern to academics. For example, "online, the teacher's status can easily be eroded, as learners can compare teacher-designed resources with video lectures from across the world on similar topics and chat directly with experts in the field through their blogs". The point is also made that students are influenced by teachers' performances in the face-to-face setting. There is no doubt that teachers are increasingly uploading materials and web-links into VLEs to support learners (or are made to by institutional policy). However, there is less evidence that teachers are role-modelling effective e-learning to their learners (Greener, 2009).

Woltering *et al*. (2009) undertook a study of problem-based learning, comparing its use in the classroom and in blended environments. They found that motivation, subjective learning gains and satisfaction achieved significantly higher ratings by the bPBL (blended/online problem-based learning) students compared to the students learning by traditional PBL. The tutors' opinions and the test results showed no differences between the groups. Students assessed working with the web-based learning environment as very good. According to the log-file analysis, the web-based learning module was frequently used and improved cooperation during the self-directed learning. It should be noted that staff using the PBL methods had been well trained in blended and face-to-face methods.

In the New Zealand context, Mansvelt, Suddaby, O'Hara and Gilbert (2009) presented findings of a research project exploring factors influencing engagement in e-learning professional development within New Zealand tertiary education institutions. The research comprised an online survey of 408 individuals in three polytechnics and two universities and 40 qualitative interviews ascertaining beliefs, experiences and practices of staff regarding e-learning professional development. The survey and interviews suggest there are numerous factors that both help and hinder the quality of engagement in e-learning. Most professional development engaged in by staff is informal. Engagement in formal professional development is influenced by organisational structure, co-ordination, poorly developed and/or implemented e-learning policy, differences in managerial support, and individual beliefs and time allocation.

Shifts in pedagogies occur over time and are dependent on teachers gaining access to and participating in professional development to ensure they understand the pedagogical differences between teaching in traditional and new settings.

e-Learning in a Māori context

In the New Zealand context, it might be claimed that many of the issues surrounding e-learning in the western context generally, and in the Australasian region more specifically, are somewhat generic. However, there are very pertinent issues affecting Maori students in New Zealand. A seminal study by Tiakiwai (2010) for the Ministry of Education in New Zealand looked at the implications of e-learning for te reo Māori and kaupapa Māori student learning. The research found that the dearth of literature on e-learning and kaupapa Māori environments makes it difficult to confidently assert what types of teaching and learning practices might contribute to enhanced learning outcomes for students in kura kaupapa Māori settings. However, there were common themes in the literature that suggest how Māori might consider or approach e-learning technologies. The study focused on the school setting. This is important because students arrive at tertiary institutions with conceptions about e-learning that were formed at school.

The creation of learning environments that are conducive to Māori students has proved possible in an e-learning context. The literature identified several ways in which such environments could be created, including the acknowledgement and incorporation of Māori cultural knowledge into e-learning environments and settings. However, the lack of suitable, easily accessible and appropriate resources in te reo Māori continues to be an issue for kaupapa Māori environments. The importance of the learning environment in kaupapa Māori e-learning contexts also extends to the physical e-learning environment. Here, the physical environment relates to the technological infrastructure or ICT support systems that are required to facilitate e-learning. In particular, experiences of unreliable data connections, lack of access to technical expertise and the 'learn as you go' approach were seen as being inhibitors to effective engagement in e-learning for Māori in the non-institutional setting.

Bishop *et al*. (2003), reported by Tiakawaia (2010), talks about the significance of the relationship between the teacher and the student in face-to-face classroom environments. The literature reviewed here suggests that these quality relationships are equally important for Māori students who are engaged in e-learning education. For kaupapa Māori teachers, these relationships included building clusters of expertise to provide professional support and advice for e-teachers and newer e-teachers entering into the e-learning environment. Quality relationships also existed at system levels, where collaboration was seen to be an effective way of sharing limited resources available to Māori immersion settings, and where cluster-type relationships enabled the growth and development of expert e-teachers.

In line with the literature's findings on quality relationships, the significance of cultural understandings was also noted as an important factor for Māori

students. In particular, the ability for new technologies to appropriately incorporate te reo Māori and Māori ways of knowing and doing was seen as important in being able to engage Māori students in their learning.

One of the high-quality ways of incorporating cultural understandings appropriately into e-learning settings was in creating opportunities for face-to-face interactions between students and teachers. In spite of the nature of online and distance education, where physical interaction is not the primary focus, for Māori and indigenous students who engage in online and distance learning, having the opportunity to connect and make connections and relationships was seen as an important factor in ensuring students did not become isolated from their learning.

The ability of technologies and systems to recognise indigenous and Māori kaupapa and aspirations still appears some way off. This could be exacerbated as much by the lack of recognition given to indigenous and Māori aspirations by funders and commissioners of technologies and systems as by the lack of appropriately and culturally qualified personnel working in these areas.

The literature highlights the importance of the learning environment, which includes the acknowledgement of culture and quality relationships, in contributing to teaching and learning approaches that may lead to enhanced outcomes for students engaged in kaupapa Māori settings. These areas are similar to the findings of other research projects engaged in better understanding what contributes to enhanced Māori student learning outcomes. This suggests that, in spite of the interest in and attention given to emerging technologies and their application in kaupapa Māori classrooms, the key areas as identified above establish the conditions by which enhanced teaching and learning opportunities occur.

The implications for e-learning at the tertiary, mainly university level, are that the limited resources, inadequate IT provisions and cultural challenges at the school level mean that some Māori students will be arriving at university with a lower exposure to e-learning than will students from other backgrounds.

Evaluation

A significant issue in any transformation of learning and teaching involves issues of whether or not the proposed change will have an impact on how academics assess student performance in both the formative and summative sense, and how courses are evaluated.

Evaluation is an activity designed to establish if the course or programme that is the subject of redesign in a blended context meets the following criteria:

1. Is the programme or paper one that meets the requirements of the accrediting agency, *i.e.*, does it do what it sets out to do?
2. Is the programme or paper "fit for purpose", *i.e.*, does it meet with established quality assurance processes?

Blended teaching is a formal adoption of a range of teaching strategies involving pedagogy and technology aimed at developing intended learning outcomes in students. It is generally conducted by and controlled in institutions and characterised by approved methods using agreed technologies. Those engaged in blended teaching may have received instruction or help to develop their teaching strategies.

There have been several significant articles about quality assurance, one of the more important of which is by Chickering and Ehrmann (1996). However, this article appeared before learning management systems (LMSs) had been developed. In 2011, the most commonly used LMS was BlackBoard. This company collaborated with the Institute for Higher Education in the US to produce a set of guidelines for online learning. The document is *Quality on the Line* (Merisotis, 2000). The guidelines include the following elements:

- institutional support
- course development
- teaching and learning processes
- course structure
- student support
- faculty support
- evaluation and assessment.

Bates and Sangra (2011) make the point that there are several guidelines or best practice or quality management criteria, for example, e-Learning Maturity Model (Marshall), Sloan C Quality Framework and several others that have emerged. After more analysis comparing technology-based learning and classroom learning, the "no significant difference" results emerged. However, the baseline for these studies has been the face-to-face model. In this circumstance, like is not compared to like because results of studies vary so much and are affected so significantly by local circumstance. As Bates and Sangra put it, "there are often greater variations within a mode of teaching than between modes of teaching. Thus, the 'no significant difference' is often an artifact of the research design" (2011, p. 137).

It follows from this line of argument that research into technology-based teaching needs to be context-based and therefore generalisation is not always possible. Hence, for those who use digital methods for teaching, it is important to conduct research into the effects of their teaching, and to identify conditions in which it works best. For example, Ellis, Ginns and Piggot (2009, p. 315) found that "the identification of the four underlying factors described as e-teaching, design, workload and interactivity is an important contribution to research into the most meaningful aspects of e-learning when it is used to support students in a predominately face-to-face experience".

Bates and Sangra (2011) concluded that "[t]here is convincing evidence that online students do just as well if not better than students in face-to-face courses, but more important, the results depend on the conditions in which students are studying. All modes of delivery will suffer from badly designed teaching or inadequate resources" (p. 147).

During the last 11 to 12 years there have been more than 1000 studies on e-learning evaluation (Bates & Sangra, 2011). Many of these involved blended learning and most of the courses studied were in the early stages of transformation into a blended format. It is clear that careful instructional design is required to ensure that any learning, whether face to face, online or blended, is successful. Local infrastructure and the application of sound pedagogical and technological processes go a long way to ensure the success of blended learning teaching strategies.

Student engagement

The *Australasian Survey of Student Engagement* (Radloff & Coates, 2011, p. vi) defines student engagement as "students' involvement with activities and conditions likely to generate high-quality learning".

Student engagement is important because not only is it related to learning outcomes (Dixon, Kuhlhorst, & Reiff, 2006; Swan & Shih, 2005), it has also been identified as a major influence on retention and completion rates (Kuh, Cruce, Shoup, Kinzie, & Gonyea, 2008). Recent changes in New Zealand government policy have included the addition of a student completion component to the tertiary education funding policy (Ministry of Education, 2010), focusing the concern of tertiary institutions on non-completion. This problem has been exacerbated by the huge influx of non-traditional students who bring with them extra challenges for retention (Scott, 2005). Many of these students have other life commitments, such as family and work, that compete with their studies for time (Hoyt & Lundell, 2003). In addition, different groups of students have specific issues: international students face language barriers (Holmes, 2005); Māori students have good completion rates in qualifications below degree level, but have low rates at degree level and above (McKenzie, 2005; Scott, 2005); and Pasifika students have the lowest completion rates in New Zealand (Benseman, Coxon, Anderson, & Anae, 2006; Scott, 2005).

For any country, the economic and social implications of efficiently and effectively developing human capital are self-evident. Every student dropout represents wasted resources and a lower level of human capital. Having less immediate impact, but perhaps a more pervasive one, is the failure of students to learn as much or as well as they can. An education system that is not maximising student engagement is producing students who are not as capable or as competent as they could be, short-changing society at large.

Engagement models

There is a wide and diverse body of literature related to the issue of student engagement (see for example, Angelino & Natvig, 2009; Rovai, 2003; Tinto, 1975); however, these studies often take a high-level, institutional approach to retention and include all aspects of the student experience from recruitment to career launch. Several models have also been developed to explain the various influences on student retention, but the wide focus of these studies lack useful detail for that aspect of the process of most interest to classroom teachers, strategies to improve student engagement in particular courses.

In 1975, Tinto conducted a detailed analysis of the literature to formulate a theoretical model that clarified the relationship between individual students and their educational institutions to explain student attrition. His work indicated that social and academic integration promoted stronger student commitment to their institutions and made students persist longer (Tinto, 1975). Tinto's work highlights the importance of inclusion but offers little else to the classroom teacher on structuring their courses to create interesting and engaging experiences for their students.

Several researchers have tried to develop or clarify Tinto's seminal work. For example, after a comprehensive review of the literature Rovai (2003) developed a persistence model to explain student attrition in online learning. He proposed two pre-admission variables – student characteristics and student skills – and two post-admission variables. These included external factors, such as employment demands, financial pressures and outside support, and internal factors such as study habits, self-esteem, academic and social integration.

Angelino and Natvig (2009) used Tinto's model to develop a broad framework that captured student engagement in a range of experiences with their institution from recruitment to becoming alumni. Their main focus was attrition rates, but one aspect of their model that is of particular relevance to the classroom teacher is 'coursework'. This section lists a number of useful practical ideas that might be helpful in designing and delivering courses. However, these suggestions have not been tested empirically.

These holistic institutional studies place student engagement in the larger framework of the student's total experience in higher education. Those parts of the framework that address student behaviour in the classroom tend to be presented as lists of specific strategies or techniques that may be used by the teacher. What is not evident in this body of work is a mechanism that enables teachers to systematically select from these lists a set of strategies that will meet the engagement needs of their particular students. Many studies find engagement strategies by identifying causes of disengagement, from which they then derive recommendations for retention strategies. Relatively few studies empirically test the usefulness of the engagement strategies (Christie, Munro, & Fisher, 2004; Laing & Robinson, 2003; Park & Chen, 2007).

One fruitful area that has been examined widely is the work on the first-year experience of tertiary study. The literature has consistently found the first year to be the most important influence on student decisions to persist in their studies and it has become evident that failure to integrate and engage these first-year students results in high attrition rates (Allen, 1999; Blythman & Orr, 2003; Fitzgibbon & Prior, 2003; Tinto, 1996; Trotter & Roberts, 2006). This body of work focuses on strategies for helping high school students to transition successfully to tertiary-level education. It is argued here that the same issues of acculturation and persistence for new tertiary students may have resonance with all students starting a new course. For example, students who are not 'captured' at the start of a course are vulnerable to dropping out. Strategies that

assist first-year students to transition into the academic environment may provide clues to useful approaches to engaging students in courses that are 'new' to them.

Critical stages for engagement in learning

The work on first-year retention signalled the importance of different time periods to student retention. Fitzgibbon and Prior (2003, p. 7-8) take this a step further in their report on a pilot to improve attrition rates at Glamorgan University. They draw attention to four critical time zones when students are most at risk. These include:

> Zone 1: enrolment, induction and the first two weeks of teaching
> Zone 2: late enrolment, late induction and early weeks of teaching
> Zone 3: middle to end of teaching period, first/second assessments
> Zone 4: final assessment period, revision and examinations or assignments.

These zones encompass the wider university's interaction with the student but of relevance to the classroom teacher is the importance of strategies relevant to the early stages of the course and other strategies for the middle to the end of the teaching period (zones 2 and 3). At these different stages, Fitzgibbon and Prior (2003) argue, particular engagement issues arise that need to be taken into account. In addition, the classroom teacher should be concerned with the strategies they can use when students, at any stage of the semester, either fail to engage or become disengaged.

Securing early engagement during transition

Seminal work by Tinto (1975; 1993) found that first-year students' decisions to continue or withdraw from study were strongly influenced by the extent to which they were socially and academically integrated into the learning institution. Tinto's work has clarified the importance of this transitional phase of the student's experience. Students may be transitioning from a variety of situations, including high school, the work force or overseas institutions. This transition period is now widely accepted as a time of vulnerability for students, and the time they are most likely to give up study (see for example, Buglear, 2009). Sidoryn and Slade (2008) extend the issue by arguing that transition is not just limited to the first-year experience but continues through the student's academic career. It is possible to extend this argument further and suggest that the early stages of any course also represent a transition phase as students become acculturated to a new academic area. Support for this notion is found in work showing that students are most likely to withdraw from a course in the early stages, usually up to the due date of the first assignment (Kuh, *et al*., 2008).

Student vulnerability to disengagement can manifest in two ways: as alienation, when the student feels isolated, or as a failure to have their attention captured.

Social presence and belonging

Tinto (1975; 1993) established that students had a need to 'belong' to the institution, and failure to experience this sense of belonging was a risk factor for dropping out. More recent work by Krause *et al.* (2005) reported that in Australia only 35 *per cent* of international students agreed that they felt like they belonged to the university community, as opposed to 52 *per cent* of domestic students. In addition to belonging to the institution, Krause *et al*. (2005) found that students who felt they were part of the discipline had higher levels of engagement. In their seminal work on situated learning, Lave and Wenger (1991) argued the need for students to be 'enculturated' into the discipline early in the course. Guan, Tregonning and Keenan (2008) also found a lack of social bonding to be a major hindrance to active engagement.

In a project intended to give first-year students the opportunity to meet and work with their peers, engage with their teachers, and feel themselves to be a part of the physics discipline and the university, Parappilly, Quinton and Andersson (2009) organised a pre-course day in which students worked in teams on challenging, authentic physics tasks and interacted with their teachers. They found that these students subsequently felt less isolated, collaborated more with other students and had higher learning outcomes than previous cohorts. Importantly, retention to the second year improved by 25 *per cent*.

In an online environment, the potential for social isolation is even greater than in the classroom, though some have argued that online tools increase the opportunity for social interaction. MacDonald and Thompson (2005) found that in an otherwise successful online course, students reported missing face-to-face contact with others. Awareness of this issue has stimulated work on the concept of social presence, which is defined by Garrison (2009, p. 352) as "the ability of participants to identify with the community, communicate purposefully in a trusting environment, and develop inter-personal relationships by way of projecting their individual personalities". Garrison proposes three categories of social presence: affective expression, open communication and group cohesion. Despite the potential for online isolation, there is evidence that it is possible to create online communities (Rovai, 2002a; Shea, 2006; Thompson & MacDonald, 2005), and that such communities have been associated with learning (Rovai, 2002b; Shea, 2006; Shea, Li, & Pickett, 2006).

Akyol, Garrison and Ozden (2009), who compared an online and blended course, argued that social presence in both online and classroom contexts creates a comfortable environment in which participants can work together and share ideas. Heaton-Shrestha *et al.* (2009) found more muted support for this effect, reporting that students felt that while their online environment had not contributed much to communication between students, it did promote a sense of belonging and community. Even peripheral involvement through 'lurking' has been found to foster a sense of belonging and community (Preece, 2000).

Garrison and Arbaugh (2007) argue that group cohesion requires intellectual focus. To become sustainable, social presence needs to progress further than simply establishing personal relationships, and must be directed to achieving an

identified purpose (Thompson & MacDonald, 2005). Group cohesion and social presence have been found to contribute to higher-quality learning outcomes (Dixon, *et al.*, 2006; Swan & Shih, 2005). The purpose of social presence, then, is to support cognitive engagement in the learning process.

Capturing student attention

Teachers share a common problem with entertainers, marketers and writers; they need to get the attention of their audience before they can deliver the message, either in the classroom or online. Two possible approaches have been identified to capture student attention: curiosity and relevance.

Curiosity

Curiosity has long been recognised as a type of motivation that drives human behaviour, though since the mid-1980s it has been on the periphery of educational research (Loewenstein, 1994). Early and seminal work by Berlyne (1960) identified two types of curiosity: diversive (actively seeking novelty and challenge) and specific (actively seeking to increase one's knowledge and experience). Berlyne (1960, p.274) defines specific curiosity, of most interest to teachers, as the "arousal that motivates the quest for knowledge and is relieved when knowledge is procured". Others have also associated curiosity with the concept of optimal arousal (Arnone & Grabowski, 1994; Ashcroft, 1987; Day, 1982). At low levels of arousal, students experience boredom and their attention wanders. As arousal levels increase, their attention becomes more directly focused on the task. Beyond optimal arousal, performance starts to diminish as anxiety interferes with their cognitive functions.

Similar to Berlyne (1960), Loewenstein (1994) proposes an information gap perspective of curiosity. His theory argues that when individuals become aware of an information gap they will experience curiosity, which he describes as a feeling of deprivation. An interesting aspect of his work demonstrates that curiosity increases as knowledge grows. As individuals become more knowledgeable, they can more readily identify gaps in their knowledge, stimulating further curiosity. Consequently, individuals experience higher and higher levels of curiosity about areas they know the most about. This suggests that teachers may need to 'prime' students' curiosity in the early stages of a course. As they develop a greater understanding of the subject area, students could be expected to experience their own curiosity and thus to recognise and seek to fill their own information gaps.

Curiosity, then, has both cognitive and motivational aspects, and these combine as powerful drivers of learning. As Loewenstein (1994, p. 95) says, "curiosity is influenced by cognitive variables such as the state of one's knowledge structures but may, in turn, be one of the most important motives encouraging their formation in the first place."

Several studies have explored the relationship between curiosity and learning performance (Keller, 1987; Reeve, 1992). When studying adult workplace learning, Reio and Wiswell (2000) found that curiosity was directly related to learning by increasing information-seeking activities, creative thinking and

problem solving. Keller (1987) argues that curiosity plays an important role in the first component of his model – gaining and sustaining student attention. In a more general study, Kashdan, Rose and Fincham (2004) found curiosity to be related to progress, effort, purpose commitment and enjoyment in the pursuit.

Reeve (1992) proposed that when individuals found a task or activity to be interesting or novel, their curiosity would be aroused and their intrinsic motivation engaged. Keller (2010) also advocated the use of curiosity in learning to arouse attention and stimulate information-seeking and problem-solving behaviours.

Relevance

Things are considered to have personal relevance when they are perceived as being instrumental in satisfying needs and wants, including the achievement of personal goals (Keller, 1983). Establishing relevance early in a course is important because when students first encounter information, they immediately try to identify its fit with their own knowledge, experience, and personal drives. If there is no direct 'fit', it is more likely to be rejected. Relevance is regarded as a sub-dimension of motivation and has been frequently studied for its relationship to a variety of learning-related issues including engagement (see for example, Doo & Kim, 2000; Levy, 2007; Shea, Pickett, & Pelz, 2003). Many of these studies have found that students who find little personal relevance in their study are less likely to become engaged and more likely to drop out (Doo & Kim, 2000; Levy, 2007; Park & Choi, 2009). Others have also found that personal relevance is key to student involvement in learning (Murray & Sandars, 2009). These studies suggest that relevance is important to student persistence; however, other work indicates that relevance may play additional roles in the learning process.

Several studies have shown that personal relevance may change the way in which students process information and how they interact with other students. In a study of young adolescents, Ozkal,Tekkaya, Cakiroglu and Sungur (2009) found that when teachers provided opportunities for students to find personal relevance in course content, students were more likely to hold more sophisticated epistemological beliefs about the nature of knowledge and to see it as changing and evolving. They felt more confident about expressing learning concerns and interacted more with fellow students to deepen their level of understanding.

Relevance is thought to influence student learning behaviour through its positive impact on intrinsic motivation (Finney & Pyke, 2008; Frymier & Shulman, 1995; Seddon, 2008). Substantial evidence exists for the relationship between intrinsic motivation and deep processing by students (Biggs, 1987; Entwistle & Peterson, 2004; Lepper, 1988; Ramsden, 2003). In addition, students who perceive personal relevance in their course will be more prepared to attempt and persist at challenging tasks (Lepper, 1988). Consequently, through intrinsic motivation, relevance is associated with more meaningful learning.

Assor, Kaplan and Roth (2002) posit another way in which personal relevance fosters engagement. They draw on Self-Determination Theory (Ryan, 1993;

Ryan & Deci, 2000), which argues that three teacher behaviours influence student engagement: autonomy-support, competence-support (structure) and relational-support (interpersonal involvement). When students are able to realise their personal goals and aspirations, they experience feelings of autonomy. Teacher behaviour that supports autonomy include: encouraging students to take the initiative, providing choice, using minimal levels of control, recognising perspectives and feelings of others, and clarifying relevance (Skinner & Belmont, 1993). Assor *et al*. (2002) found that fostering relevance was particularly important in generating positive feelings about learning, and both cognitive and behavioural engagement.

In an online environment, Murray and Sanders (2009) found that relevance was key to the type and continuity of engagement. Park and Choi (2009), however, reported that relevance, along with organisational support, was a critical predictor of adult students' decisions to persist or withdraw.

The ARCS[1] Motivation Model (Keller & Suzuki, 2004; Keller, 1983), which integrates the literature into a framework to help teachers develop strategies for improving motivation, is widely used and cited (see for example, Lin, 2009; Shellnut, Knowlton, & Savage, 1999; Small & Gluck, 1994). Keller's model suggests that gaining attention through curiosity should be immediately followed by ensuring that students believe content to be relevant to important personal goals and these must occur in the very early stages of the course, a position supported by Kift (2008) who advocated for the development of 'transition' pedagogies to support students in the early stages of new academic courses.

Maintaining engagement

After the early stages of a course when capturing student attention takes precedence, the teacher needs to ensure other strategies are in place to maintain student engagement. This equates to Fitzgibbon and Prior's (2003) zone 3. Six strategies emerged from the literature as having direct relevance to maintaining engagement. These related to the organisation and structure of the course: challenging, authentic learning tasks and quality feedback.

Organisation and structure

Although not widely reported in the literature, students consistently state a preference for courses that are well organised and structured. After interviewing more than 1,600 students from 90 campuses across the US, Light (2001) reported that the majority of students, including those from Harvard, preferred highly structured courses. This finding was supported by Hunt, Eagle and Kitchen (2004) who found that a preference for structure was the highest rated of a range of common learning characteristics by New Zealand university students. Students grouped clear guidelines and transparency in the assessment process as important components of good structure and organisation. Beck and Davidson (2001) also reported undergraduate students to be high on structural dependence, intolerant of ambiguity and wanting to know exactly what their

[1] ARCS stands for Attention, Relevance, Confidence, and Satisfaction

teacher expectations were. Similarly, Madsen and Turnbull (2006) found that graduate students, directed to use portfolios for evaluation, had difficulty with the ambiguity of the project and wanted to be given detailed instructions on the procedure they should follow.

In a study of the tension between structure and flexibility of course design, Thompson and MacDonald (2005) determined that students' confidence and competence increased in courses that were carefully mapped out. However, they also argued that course design should include enough flexibility to respond to emerging student needs. Their finding that competence increases in well-structured courses implies that structure may play an important role in enabling learning. Course design and assessment strategies were identified by Rust (2002) as being important determinants of whether students used a surface or deep approach to learning.

In an online environment, structure and organisation is of even greater importance, as the traditional social cues and norms of the classroom are missing (Anderson, 2002; Coppola, Hiltz, & Rotter, 2002; Garrison & Arbaugh, 2007). In an online environment, course structure and organisation have been labelled 'teaching presence', an important component in the Community of Inquiry Model (Anderson, Rourke, Garrison, & Archer, 2001). Teaching presence is made up of three dimensions: instructional design and organisation; facilitating discourse (originally called "building understanding"); and direct instruction. Design and organisation involve planning and designing the structure, activities and assessment and is the component of teaching presence that teachers have the most control over (Anderson *et al.*, 2001).

In an online environment, design and structure involve re-designing course materials specifically for the online environment, not just dumping an unsorted quantity of resources. For example, mini-lectures rather than videoed live lectures work better. Design, or re-design for an online context, is important because a clear and consistent course structure has been found to be the most consistent predictor of successful online courses (Swan, 2003; 2004). Shea (2006) reported that students associated effective design and organisation with a higher sense of learning community. Garrison and Arbaugh (2007, p. 163) also found teaching presence to be "a significant determinant of student satisfaction, perceived learning, and sense of community".

Structure has also been associated with the depth of approach to learning that students take. Gibbs (1992, p. 2) defined a deep approach to learning as "to make sense of what is to be learnt, which consists of ideas and concepts [and] involves thinking, seeking integration between components and between tasks, and 'playing' with ideas". Gibbs identified the two characteristics of courses that foster surface approaches as an excessive amount of course material, and threatening and anxiety-provoking assessment systems. Without the appropriate structure, scaffolded learning and facilitated guidance from the teacher, large volumes of resources simply increase the work that students have to do to determine which of that material is important. The difficulty of the learning task has been increased, but not in a way that promotes better learning. While a

teacher may see structure and organisation in such a multitude of resources, students are more likely to be overwhelmed. Gibbs (1992, p. 10) argues that "content should be taught in integrated wholes", not presented simply as a long list of unsorted materials.

Students value well-structured courses (Stodel, Thompson, & MacDonald, 2006). They perceive these to consist of curated material that is appropriately organised, and clear, transparent assessment guidelines.

Challenging, authentic tasks

Academic tasks are a critical part of the learning process because students learn what the task directs them to do (Doyle, 1983). It follows then that students will not develop competencies that are not demanded by their learning tasks. Academic learning tasks determine what students will be able to do, so higher-level cognitive, self-regulatory and social skills will only eventuate if teachers design tasks that exercise these faculties.

Seminal work by Brown, Collins and Duguid (1989) posited the benefits of a cognitive apprenticeship model of learning, whereby learning is situated in the context and culture in which knowledge is developed and used. The kind of real-world activities proposed required the student, through a system of involvement in the performance of the task, first peripherally as they watch and model experts, to take on an increasingly central role. In this way, students become 'enculturated' into the discipline and develop the appropriate cognitive, social and self-regulatory skills associated with the discipline area. This early recognition of the power of authentic learning has underpinned much of the subsequent research on situated learning and authentic tasks.

The argument for using challenging and authentic tasks is built upon two fronts: it promotes the development of more sophisticated knowledge structures, and students become more deeply engrossed in achieving the learning outcomes.

According to Lombardi (2007) there are three important aspects to authentic learning tasks. They focus on "real-world, complex problems and their solutions", involve "participation in virtual communities of practice" and "intentionally bring into play multiple disciplines, multiple perspectives, ways of working, habits of mind, and community" (p. 2).

Herrington, Oliver and Reeves (2003, p. 62-63) identified 10 key characteristics of authentic tasks that have been widely cited in the literature. Authentic tasks:

- …will have real world relevance,
- …are ill-defined, requiring students to define the tasks and sub-tasks needed to complete the activity,
- …comprise complex tasks to be investigated by students over a sustained period of time,
- …provide the opportunity for students to examine the task from different perspectives, using a variety of resources,
- …provide the opportunity to collaborate,
- …provide the opportunity to reflect,

- …can be integrated and applied across different subject areas
- ..are seamlessly integrated with assessment,
- …create polished products valuable in their own right rather than as preparation for something else,
- …allow competing solutions and diversity of outcome.

One characteristic that is often associated with authentic tasks is challenge, a quality Csikszentmihalyi found to be associated with deep engagement. When contemplating the work behaviour of artists in the 1960s, he began to develop the concept of flow to capture the intense engagement that characterised their performance (Nakamura & Csikszentmihalyi, 2002). Flow is described as a state in which the individual is totally immersed in an activity, feels an energised focus, and believes in the ultimate success of the activity. Nakamura and Csikszentmihalyi (2002, p. 90) describe 'being in flow' as the "experience of engaging in just manageable challenges by tackling a series of goals, continuously processing feedback about progress, and adjusting action based on that feedback". They propose (2002, p. 90) two conditions of flow:

- perceived challenges, or opportunities for action, that stretch (neither overmatching nor underutilising) existing skills; a sense that one is engaging challenges at a level appropriate to ones capacities
- clear, proximal goals and immediate feedback about the progress being made.

These characteristics of intense engagement have been successfully applied to online gaming. McGonigal (2010) argued that online games engender intense engagement because they are structured to be challenging. She describes a challenging task as one that exactly matches a player's level of ability, but at the edge of that ability so the player had to work hard to achieve the goal. Challenging tasks of this nature promote 'intense optimism', which she describes as "extreme self-motivation, the desire to act immediately and the hope of reasonable success". Like others, she argues that people are happiest when they are engaged in hard, meaningful work. This view finds support in Brophy (1987) who argued that challenging academic tasks can foster motivation when students engage in sustained activity, using complex cognitive processes that require them to expend effort.

Miller (2010) proposed three ways in which challenging tasks might promote motivation. Such tasks should require students to use self-regulatory strategies and prior knowledge, and also provide the opportunity for collaborative learning. In a study of eight classes that had high-challenge tasks designed for them, Miller (2010) found that students in all classes strongly preferred high-challenge tasks and had high expectations of success. Surprisingly, these views were endorsed by the lowest achievers, who had not been overwhelmed by the difficulty of the tasks nor the effort required. Students preferred high-challenge tasks because they were able to be creative, experience enjoyment and expend effort. Low and average achievers in classes with more opportunities for high-challenge tasks expressed a strong preference for these types of task and displayed confidence in their abilities. Students in classes with fewer high-

challenge opportunities also expressed a preference for them but were less confident of their ability to achieve them.

Authentic tasks that are also challenging could be complex, real-world problems that call on higher cognitive skills, self-regulation and collaborative strategies, matched to the students' ability to allow a reasonable possibility of success, and require the student to expend effort over a sustained time frame.

Feedback

Feedback is information given to students about their performance efforts for the purpose of improving that performance. According to Nakamura and Csikszentmihalyi (2002) immediate feedback is a necessary condition of intense engagement. Feedback is thought to work at both a cognitive and motivational level. At the cognitive level, feedback reinforces learning and clarifies mistakes. This enables the student to adjust their thinking or behaviour to a closer approximation to the desired outcome (Shute, 2008). At the motivational level, feedback is thought to increase student drive to keep learning; for example, Gao and Lehman (2003) found that immediate elaborated feedback produced significantly higher levels of motivation. Studies on feedback have examined both the type and the timing of feedback.

Types

Five types of feedback were identified by Dempsey, Driscoll and Swindell (1993). They include: no feedback; simple verification feedback, called knowledge of results, which tells the student whether their answer is correct or not; knowledge of the correct result tells the student the correct answer; elaborated feedback points out the student's errors and explains why it is wrong and what the student needs to do to reach the correct answer; in try again feedback, when students give an incorrect answer, they are allowed to try again. Of these, elaborated feedback is reported as being more helpful than non-specific feedback.

Studies consistently report that highly specific feedback that elaborates on the ways students can improve their performance results in better learning (Bangert-Drowns, Kulik, Kulik, & Morgan, 1991; Cheng, Lin, Chen, & Heh, 2005; Dorow & Boyle, 1998; Narciss, 2004). Dorow and Boyle (1998) found that general statements such as "weak argument" were less effective than comments that explained how to improve their work. Banget-Drowns *et al*. (1991) found that simply telling students that their answer was right or wrong was less effective than providing information about correcting their errors. Likewise, praise or punishment are less effective than elaborated, specific information that enabled students to adjust their learning (Hattie & Timperley, 2007). Students themselves report a preference for comments that indicate what is right and wrong about their assignments and provide suggestions for improving their work (Beach & Friedrich, 2006).

While elaborated feedback is widely recognised as beneficial, it needs to be used cautiously. Learning is more effective when feedback is kept as simple as possible. Overly complex feedback can confuse students and cause cognitive

overload (Kulhavy, White, Topp, Chan, & Dams, 1985; Mayer & Moreno, 2002). Similarly, Bransford, Brown and Cocking (2000) recommended presenting feedback in small chunks to avoid overwhelming the student, and risk it being ignored.

Feedback that is vague and general is likely to frustrate students and be perceived as worthless (Moreno, 2004; Williams, 1997). Students have to make a much greater cognitive effort to interpret such feedback and may feel unsure about how they should apply this feedback to their work (Bangert-Drowns, *et al*., 1991; Fedor, 1991).

Under a number of conditions, feedback can have a negative effect on learning. When it is perceived as criticism or as being controlling it has been negatively associated with learning performance (Fedor, Davis, Maslync, & Mathiesond, 2001). Several studies confirm that the potential benefits of specific comments can be negated when they are accompanied by a mark (Butler, 1988). Students tend to focus on the mark and ignore the comments, thereby depriving themselves of an opportunity to improve their learning. This is a particular problem when the marks indicate the student's ranking relative to their peers, and when this normative feedback is accompanied by general, non-specific comments (Kluger & DeNisi, 1998; Wiliam, 2007). Finally, interrupting a student when they are engaged in a task with feedback from an external source can also have a negative impact on learning (Corno & Snow, 1986).

Timing

Feedback can be given immediately or delayed. Generally, the weight of evidence strongly suggests that in most circumstances immediate feedback is more effective than delayed. Immediate feedback allows students to correct errors quickly, making learning more efficient (Corbett & Anderson, 2001; Mason & Bruning, 2001).

Early in the learning process immediate feedback is important and also when the task is difficult relative to the student's ability (Clariana, 1990). Gao and Lehman (2003) found that immediate feedback enhanced achievement and increased relevance and student confidence. When students are faced with a relatively simple task, delayed feedback can avoid unnecessary intrusion, which may result in frustration for the student (Clariana, 1990).

Re-engaging the disengaged

Before a student makes the final and irreversible decision to formally withdraw from a course, there appears to be a period of time in which their behaviour signals that they may be at risk of taking this final step. Students in this 'zone of discontent' will skip class more frequently, be more inclined to procrastinate and demonstrate poorer study skills than their classmates (Fitzgibbon & Prior, 2003; Johnson, 1994). The importance of physical attendance is stressed by Gracia and Jenkins (2002) who found that students who succeeded attended an average of 88 *per cent* of classes, compared to 69 *per cent* by those who failed.

Monitoring and early identification are regarded as the key to re-capturing (or engaging for the first time those who have failed to engage) students at risk of withdrawal. Trotter and Roberts (2006) advocates the importance of monitoring class attendance and developing procedures for personally contacting students. Likewise, Fitzgibbon and Prior (2003) stress the need for early identification of non-attendance so that remedial actions can be initiated in a timely manner. They also recommend the singling out of students with late enrolments for special attention as these students are often associated with problems that can cause the student to withdraw.

Fitzgibbon and Prior (2003) found that a gentle reminder was often enough to change attendance behaviour. In more severe cases, early identification provided a workable time frame for introducing extra guidance and support from a variety of university agencies. The early nature of the intervention is important because it usually leaves the student sufficient time to regain lost ground before the end of the semester.

Students who procrastinate find it hard to focus their attention on a task, have difficulty calculating the time needed to finish it, and are poor at evaluating the efficacy of their study behaviour (DeWitte & Lens, 2000). Procrastination has been associated with extrinsic motivation, poorer performance and a less positive attitude to their courses (Deci & Ryan, 1991) and, along with time management, is a significant reason for disengaging (Doherty, 2006). Orpen (1998) associates procrastination with surface rather than deep learning, an argument supported by Artino and Stephens (2009) and Wolters (2003; 2004), who found that students who are highly self-regulated and engaged in critical thinking procrastinated less than other students.

As with poor performance, the third indicator that the student is in the zone of discontent, that is procrastination, may be difficult to monitor in the traditional classroom as it does not usually come to the teacher's attention until after the first assessment. When these students receive disappointing feedback on their assessment it may well cause them to become discouraged and question the value of continuing (Fitzgibbon & Prior, 2003). A number of strategies have been proposed to counter these problems.

Early identification has been proposed as a key factor in saving students from dropping out (Fitzgibbon & Prior, 2003). Such identification of procrastinators and poor performers is possible using learning analytics of online environments such as Moodle and Blackboard. These systems provide a variety of report options either at the level of individual students or on a class basis. Teachers can use these to monitor students' online engagement from the start of the course. These systems also have a simple mechanism to allow the teacher to individually contact students. For the traditional classroom, Fitzgibbon and Prior (2003) recommend regular progress reports from tutors as a useful measure throughout the year to identify students in trouble.

Giving timely, helpful feedback and support to students identified as struggling are argued to be effective strategies for reducing the risk of dropping out

(Doherty, 2006). Artino and Stephens (2009) suggest that differential support to students with less well-developed self-regulatory skills in the form of guidance and scaffolding will help procrastinators and students with poorer learning behaviours to engage more critically. More frequent deadlines are also recommended by Doherty (2006) and Artino and Stephens (2009).

Tuckman (2007) found that providing procrastinators with motivation scaffolding using online support group meetings and interaction with teachers during office hours increased course performance. In an earlier study, Tuckman (1997) found that weekly tests in a traditional classroom prompted procrastinators to perform better than those without such a requirement. He suggests that help with self-regulation and planning were key to assisting students who procrastinate.

Student engagement in a blended learning environment

Much of the literature on student engagement is sited in the classroom. However, in a blended learning environment teachers must consider not only engagement strategies to promote student performance in a face-to-face context, but also how they will organise the online environment to involve students "with activities and conditions likely to generate high-quality learning" (Radloff & Coates, 2011, p. vi). Since engagement strategies are directed at fostering the same types of behaviour online as in the classroom, it is reasonable to assume that the same type of strategies that work in the classroom will be effective online. However, the manner of implementation is likely to be different for two reasons: first, the nature of the online context may dictate how the strategy can be used; and second, in an online environment the control and management of learning changes as the student takes more responsibility for initiating, organising and persisting in learning activities (Sharples, 2005).

Context

Aspden and Helm (2004) describe how the inclusion of an online element extends the physical presence of the educational institution to maintain engagement with the student whenever they choose to access the online environment when they are off-campus. Online sites are more than just learning websites; they are one of the external faces of the institution and just as the physical institution has a concern for the engagement of its students in campus life, online learning sites carry that responsibility in the virtual context. When students find online sites interesting, challenging and inclusive, teachers support the institution's efforts to engage students.

The most challenging engagement strategy to achieve online is the sense of belonging, as numerous studies have shown that online environments have a much greater potential to exacerbate feelings of isolation and disconnection. In face-to-face contexts both intimacy and immediacy, the essential characteristics of social presence (Gunawardena & Mclsaac, 2004; Short, Williams, & Christie, 1976; So & Kim, 2005), are readily created by the teacher in the normal course of talking to and interacting with students. In an online context this is much more difficult. Aspden and Helm (2004) found that teacher inattentiveness to their students can negatively affect students' sense of alienation. This is very apparent

online when teachers do not respond to email requests or when online materials are not updated.

Coherence between online and face-to-face engagement strategies does not mean replication. Indeed, having two contexts allows for strategies to be complementary. For example, Aspden and Helm (2004) reported that having access to online resources and other students fostered better preparation for face-to-face contact in the classroom. They also found that online discussions about difficult topics outside of the classroom reduced student feelings of isolation and disconnection. Others argue that establishing relationships in person is preferred to doing it online as individuals use many non-verbal cues to establish trust and connection (Conole, de Laat, Dillon, & Darby, 2008; Holley & Oliver, 2010). However, once such a connection is made, online communication and collaboration between students works more easily (So & Brush, 2008).

Different manifestations of the same type of engagement strategy can also meet the differing needs or preferences of students. A critical aspect of engagement is the interaction between student and teacher and other students (Hillman, Willis, & Gunawardena, 1994; So & Brush, 2008). Online interaction offers quite experiences different from those in the classroom, and students who might relish interaction in one context may not be comfortable in the other. For example, students who were reluctant to speak up in class, when given time to reflect and collect their thoughts, were more prepared to contribute online (Aspden & Helm, 2004). Similarly, students who felt that online discussions were mechanical and inhibited intimacy and immediacy preferred the instant feedback and interaction of the classroom (So & Brush, 2008).

Developing engagement strategies for two contexts may increase teacher workload; however, it also doubles the opportunities for creating engaging experiences. So and Brush (2008) found that students valued the differences afforded by the two contexts as the multiple engagement components offer different approaches. They also reported that students enjoyed the opportunities presented by blended environments to engage in both individual and collaborative learning (So & Brush, 2008). However, they stress that there is a greater need for integration between the different engagement activities in a blended course than in a single-mode course.

Distributed control and management

As others have pointed out, an online environment reduces much of the direct control the teacher has over the learning experience (Holley & Oliver, 2010; Sharples, 2005). The student takes much more responsibility for time on task, structuring and managing his or her learning experience. The teacher's role is to provide learning opportunities in ways that facilitate the student's ability and motivation to engage in these opportunities. The role of engagement strategies in this context becomes even more important than in the classroom because they must remotely entice, encourage, stimulate and convince students to engage in the learning opportunities presented; students can more easily avoid engagement or become disengaged than in the classroom. The audience is no

longer captive. The engagement strategies have to work harder online than in the classroom, hence the need for greater consideration.

Several studies found that blended courses offered students the opportunity to exploit differences in online and classroom experiences to structure their overall learning experience to meet their own needs (Aspden & Helm, 2004; So & Brush, 2008). Students welcomed and responded positively to the chance to take greater control and responsibility for their learning. The blend of engagement strategies enabled students to participate in learning in a variety of ways that met their particular circumstances and needs. Aspden and Helm (2004) argue that the flexibility afforded by blended experiences positively enhances the effectiveness of learning interactions.

While a blended environment can offer a greater range of engagement activities, it is also possible that a failure to adequately integrate these components into a coherent whole has the potential to generate new problems (Parkinson, Greene, Kim, & Marioni, 2003). The key to a successful blended learning design is the "*thoughtful integration* of classroom face-to-face learning experiences with online learning experiences" (Garrison & Kanuka, 2004, p. 96).

Summary

Reports of good outcomes for students in blended learning environments are driving the trend towards technology-enabled tertiary education Blended approaches appear to offer opportunities for additional learning time and elements not received by students in traditional face-to-face conditions. The type of media seems to have only a small impact on effectiveness; it is the selection of *methods* to engage students in the context that is the key part of effective learning.

The literature identified considerable reluctance by academics to engage with online learning. However, evidence from the recent studies show that work needs to be done to redesign curricula and to revise or learn new teaching strategies, and teachers need to be at the forefront of this development. This indicates the need for more staff development because without skilled and effective staff conducting teaching in new ways, student learning is less likely to be as successful as it might be.

The ability of technologies and systems to recognise indigenous and Māori kaupapa and aspirations still appears some way off. This could be exacerbated as much by the lack of recognition given to indigenous and Māori aspirations by funders and commissioners of technologies and systems as the lack of appropriately and culturally qualified personnel working in these areas.

Three major types of engagement strategies were identified in the literature as important to student engagement. These included strategies for capturing student attention, maintaining engagement and retrieving students who have disengaged or who never engaged.

Methodology

Introduction

A mixed-method approach, using both quantitative and qualitative methods, was used to collect and analyse data. Several benefits accrue from this approach. Quantitative and qualitative methods provide different types of answers to the research questions, providing a more comprehensive account of the relationships between the study variables, and therefore a richer understanding of them. Additionally, a mixed-method approach allows triangulation of the findings so that they may be mutually corroborated, increasing our confidence in the validity of the results.

Sample

The research has three distinct dimensions: courses, teachers and students. The student samples were drawn from second- and third-year undergraduate courses but included one postgraduate class. Researchers chose the second- and third-year cohorts for their large size. First-year students were not included as their performance and retention is influenced by the transition to tertiary study, for example, feelings of alienation, selecting inappropriate courses and adjusting to a need for a more self-directed learning approach. The study originally intended to include cohorts from another large tertiary institution and a wānanga but unexpected events resulted in them not being able to take a full role in the project and their students were not surveyed. Students from the remaining courses (nine) and tertiary institutions (two) made up the student sample of 541 students. The classes were from business degrees, which gave homogeneity to the samples.

The courses included classes in economics (2), marketing (2), communication (3), and research methods (2).

There were 21 teachers involved in the project. Of these, six taught the nine courses in the study (some teachers taught more than one course). Teachers involved with the project courses were interviewed specifically about the project course. Other teachers answered with respect to their teaching generally.

The student sample was 541; however, this included about 100 students who did not give their name for either the pre or post questionnaires. It is possible that some of these students may be counted as two students, once for their first questionnaire, and then again for their second as we were unable to match the two parts of the questionnaire, which has been conducted at different times.

Students ranged in age from 18 to 59 with a mean age of 23.5. However, the distribution was heavily skewed with 75 *per cent* of students younger than 25. Fifty-six *per cent* were female. Forty-three *per cent* described themselves as 'Pakeha' and forty-two *per cent* as 'Asian'. Polynesians made up 3.6 *per cent* and Māori 2.4 *per cent*. Most (55 *per cent*) received most of their education in New Zealand and 35.2 *per cent* in Asia. A small group (5.6 *per cent*) were primarily educated in Europe.

The proportion of Asian students is unusually large compared to Ministry of Education figures and reflects a high percentage of international student evident in some of our tertiary institutions. To test the concern that the didactic style often associated with some international students may have influenced the results, the distribution of grades for these students was compared to that of the rest of the sample and no significant differences were found.

Procedure

Stage 1: Staff recruitment and course development

Suitable courses were identified and the teachers of those courses personally invited to take part in the research. Criteria for selection of courses included factors such as the nature of the course (business, large class size), the strength of the teachers' interest in blended learning, their willingness to participate and the location of the course in semester two. Changes to programmes by the institutions in the project, such as cancellation of programmes, and changes in teaching responsibilities resulted in several teachers having to pull out of the project and replacements being found.

The researchers met with each participant teacher to help them understand the objectives of the study and their role in the process and to explore with them useful engagement strategies. It was intended that teachers would form a small online community to share ideas and support. This did not occur largely because of teacher workload. Interviews with teaching staff indicated their views on teaching intentions, styles, preferred teaching mode and experience. Teachers were originally offered assistance by in-house academic development staff with the development of their courses to operationalise engagement strategies and set up the online environment. However, major structural changes in the tertiary sector saw most of these development staff disestablished or made redundant. We were only able to offer limited support for this part of the project. Even this offer was taken up minimally. By mid-2011, most teachers were under intense pressure from their managers to produce PBRF portfolios, and despite initial enthusiasm when first approached, they found their time and energy for the project severely reduced.

Stage 2: Student recruitment

Following the receipt of ethics approvals in each institution, students in targeted courses had the study explained to them and were invited to take part. Those who agreed to participate were surveyed to determine learning behaviours, teaching mode preferences, obstacles to study, their level of engagement and support they were given during the previous semester. The two major participating institutions used quite different learning management systems (LMSs) but the analytics were harmonised as much as possible for standard reporting purposes.

Stage 3: Strategy implementation

During the semester the level of engagement of the sample classes was monitored through the LMS, providing one of the measures of student engagement (online usage) that was used in the study. This gave good

quantitative data but with the caveat that it did not necessarily capture the quality of engagement. It was intended to focus on disengaged students to trigger re-engagement strategies. About 15 *per cent* of students left the courses out of a total of 541. Students who dropped out of the course were invited to participate in an interview to identify their reasons for leaving, but none took up the opportunity. However, the questionnaire included questions about reasons for students considering dropping out and these results give an insight into students' disengaging behaviour.

Stage 4: Final data collection

At the end of the semester researchers collected data via:

- a student survey, measuring perception of the value of engagement strategies; perceived level of engagement; whether they had considered dropping out; and post-course teaching mode preference
- student focus groups, which were conducted to probe further the survey results and to give students the opportunity to articulate their perception of the quality of the learning experience.

Additional teacher measures included:

- interviews to measure their use of engagement strategies in the classroom and their perceptions of a blended environment, including: perceived level of engagement of their students; the benefits of and obstacles to developing an engaged blended learning environment, and hindrances to teaching a blended course.

Instruments

Several instruments were used to collect both quantitative and qualitative data (see Appendix C for copies of instruments). The length and frequency of student interaction with the LMS was collected electronically. This measurement allowed researchers to identify disengaged students and the levels of re-engagement. Retention data and grades (marks) were collected from student management systems.

Some of the instruments used were modified from previous studies (such as: AUSSE, 2008; Jeffery *et al.*, 2006; Hunt, 1995). These include: student engagement, student learning support, preference for teaching mode, reasons for considering dropping out, and study behaviour.

Items from AUSSE (2008) were selected and modified to refer specifically to particular courses rather than the more general student experience. Three scales used included 'academic challenge', 'active learning' and 'teacher-student interaction'. A principal component analysis of our results produced four rather than three components, though three of them were similar. As the reliabilities were higher for our components than for the three from AUSSE, we used our own components, which we named to more closely reflect our results: structured learning activities (provided by teachers), collaborative activities, discussions with teachers, and non-structured learning activities. Items for these components are included in the section in the questionnaire headed 'Your experience of last (or this) semester'. The section 'Your experience of support',

which asked students how helpful they had found a range of people to be to their study, was also developed from AUSSE (2008).

Items for 'preference for teaching mode', and 'reasons for considering dropping out' came from Jeffrey *et al.* (2006). The section on 'study behaviour' used items from Hunt (1995) that were modified slightly to make them more applicable to current students. Three types of behaviour were measured, 'persistence', 'procrastination', and 'planning'. All scales apart from 'study behaviour' were administered pre- and post- course to measure before and after effects.

The quantitative data of students' online activities was collected electronically to provide a measure of the effectiveness of the engagement strategies.

Two new measures were developed for this study. The first was 'course components', in which students were asked to rate the usefulness of course engagement strategies to their learning. A measure was also developed to assess the extent of the presence of engagement strategies on the courses' websites.

Pilots

Three pilots (two partials and one full pilot) were conducted over two semesters to test the instruments, technology, procedures and engagement strategies. These resulted in minor adjustments, particularly related to the administration of the questionnaires. The scales were all found to have good reliabilities. A full report of these pilots can be found in Appendix B.

Analysis

Content analysis was used to interpret the qualitative data to provide a systematic, objective analysis (Neuendorf, 2002). First, the data was read to become familiar with the content. During the reading key words and phrases were identified and recorded. These keywords and phrases were then grouped according to similarity of theme and given a label that captured the nature of the content. Each piece of data was then sorted into these groups. Data in each of the groups was then sorted into variations on the theme and these sub-groups were also labelled. This procedure was used for both student and staff interviews, focus groups and written answers to open-ended questions in the questionnaires.

A range of statistical techniques was used for the quantitative data, including descriptive statistics, paired t-tests, correlations and principal component analysis. These are described in more detail in the results section of this report.

Results

Introduction

Results are presented under the research objectives of the study. These include:

- identifying appropriate engagement strategies in a blended learning context
- identifying students' preferences for, and perceptions of, a blended learning environment
- determining the effect of blended learning strategies on student engagement and student perceptions of the quality of their learning experience
- establishing the relationship between student study behaviour and engagement in a blended learning context
- determining effective methods of identifying students at risk of disengagement in a virtual learning environment (VLE).

A combination of quantitative and qualitative results is presented to address these questions. While it is unusual to mix results in this way, we found it created a richer and more comprehensive answer to the questions.

Research Objective 1: To identify appropriate engagement strategies in a blended learning context

From the literature review we developed a framework of 10 engagement strategies and found these to be important at three critical stages. These are briefly summarised below.

Getting students engaged

Getting students engaged at the start of the course has the biggest impact on the retention of students as it is in the early stages that the largest dropout rate occurs. Two major types of strategies were identified as being important: primers for getting students interest and creating an appropriate social context.

1. ***Primers for getting student attention: curiosity and relevance***
   The literature identifies two possible approaches: curiosity and relevance. Students experience curiosity when they become aware of a gap in their knowledge and are motivated to find the answer. Curiosity has been associated with optimal arousal for learning. One interesting aspect of curiosity is that it grows as knowledge grows, which suggests that teachers may need to prime curiosity early in a course. When students see a subject or topic as having personal relevance, they are more likely to experience an optimal level of arousal for learning.

2. ***Social presence and belonging: teacher enthusiasm and immediacy, and an inclusive environment***
   The social context seems to play an important role in encouraging student engagement. Students who feel a part of the class and a part of the subject

discipline are less likely to feel alienated or isolated and are consequently more likely to become engaged. Two useful options for fostering a sense of belonging are cohort or group activities and real world, authentic experiences that provide students with a sense of being a part of a particular discipline.

An important aspect of the social context is the teacher, particularly in the online environment. Impersonal environments are more likely to alienate students. Teacher immediacy – a sense of the imminent presence of the teacher – is reassuring to students. Having the site reflect the teacher's style is one important way of achieving this, but other more pragmatic ways include using a photo, contact details in a prominent place and/or having a video welcome message. Associated with this is teacher enthusiasm, both online and in the classroom. Enthusiasm for the subject matter is contagious.

Maintaining engagement

Maintaining student engagement through the course requires three types of strategy: a well-organised course with a clear structure and guidance; challenging, authentic learning tasks; and quality feedback to students.

3. ***Clear content structure***
   When students start a new course, most of the material will be uncharted territory for them. The constants they expect in a course are a clear course outline that includes the content structure and other organisational features. Students become very disgruntled with disorganised courses and changes to the expected programme.

4. ***Clear, unambiguous instructions and guidelines***
   Students are intensely interested in assessment instructions and guidelines. They may experience high levels of anxiety associated with this part of the course, which increases the need for clarity in these matters.

5. ***Challenging tasks***
   Challenging tasks are those that make the student stretch to their limits of performance. Learning happens when students make a sustained effort, and the greater the effort, the greater is the sense of achievement and motivation. Students are not motivated when given high marks for simple tasks, nor are they motivated when the task is far beyond their ability. Making this judgment is an important teaching skill.

6. ***Authentic tasks***
   Students are further motivated when they engage in tasks that they perceive as preparing them for the 'real world'. They understand that effort now has a benefit later. Transfer of learning occurs when learning tasks are structurally similar to real world tasks.

7. ***Timely feedback***

Generally, the weight of evidence strongly suggests that in most circumstances immediate feedback is more effective than delayed feedback. Immediate feedback allows students to correct errors quickly, making learning more efficient.

8. ***Elaborated feedback***
   Studies consistently report that highly specific feedback that elaborates on the ways students can improve their performance results in better learning.

Re-engaging students who drift away or fail to engage

In most courses a proportion of students will procrastinate at the start of the course, or stop engaging, usually at key points such as assessment. The literature identifies two critical strategies for re-capturing the engagement of these students.

9. ***Monitoring and early identification***
   Early identification of disengaged students through monitoring student engagement is essential to recover these students. The earlier the identification, the greater is the chance of successful re-engagement. Ideally, this could start in the first week. LMSs such as Blackboard and Moodle make this a very simple process. Taking rolls at class is also recommended. Students who are performing poorly are at risk of dropping out and should also be monitored.

10. ***Personal contact and negotiated conditions for re-engagement***
    Having identified students who are not engaged, the most effective strategy for re-engaging is personal contact with the student from the teacher. A personal email to each student is one simple option. Follow-up contact for students who do not respond initially is also important. Such contact is most effective when the teacher works with the student to provide help and support for problems the student may have.

Research Objective 2: To identify students' preferences for, and perceptions of, a blended learning environment

Two measures were used to answer this question. First, students were asked to rate their preference for blended learning in relation to other modes of teaching. Then they were asked to rate the usefulness of a range of blended components to their learning. The results for this second component are reported under Research Objective 3: Student perceptions of the quality of their learning experience.

Teaching modes

Students were asked to rate their level of liking for eight modes of teaching on a five-point scale from 1, strongly dislike, to 5, strongly like. The results fell into two categories: four modes were clearly 'liked', and four were less liked and fell around 'neutral'. These are presented in Table 1, with their confidence intervals, in order of descending popularity.

Table 1:

Preferences for teaching modes

Modes	$\bar{x}(s)$	95% Confidence Interval	
		Lower	Upper
Printed study materials such as study guides, textbooks	3.95 (0.88)	3.87	4.03
Lectures	3.88 (0.80)	3.80	3.95
Tutorials	3.80 (0.81)	3.73	3.88
Mixture of online and lecture (face-to-face) courses	3.75 (0.90)	3.67	3.84
Group projects	3.24 (1.00)	3.16	3.35
Online discussions, chat rooms developed by teachers	3.16 (1.04)	3.08	3.27
Student presentations	2.96 (1.00)	2.88	3.07
Fully online courses	2.94 (1.11)	2.85	3.06

(n=435)

Students strongly preferred traditional modes of teaching (lectures, printed materials and tutorials) and blended courses over fully online courses and student-based modes (group projects, student presentations) and teacher-initiated online discussions.

Research Objective 3: To determine the effect of blended learning strategies on student engagement and student perceptions of the quality of their learning experience

Several measures of engagement were taken. First, students were asked to self-report their levels of engagement over a number of activities. Principal component analysis was used to confirm that the scales were measuring the intended constructs and Cronbachs Alpha was used as a measure of reliability (see Appendix A for detailed results). Second, activity data from the learning management systems (LMS) that hosted the online environments was harvested as a measure of the students' online activity. Third, students were asked whether they had considered dropping out of a course, and if so, why. This was supplemented by data on actual drop-outs from the student management system.

The levels of online and self-reported engagement were measured, and patterns of engagement over the semester were determined.

Engagement in the classroom was explored through semi-structured interviews with teachers. Finally, student perceptions about the quality of their learning experience were collected from multiple sources.

Self-reported engagement

The self-reported measure of engagement found that students engage with learning in four major ways, through: structured learning activities (designed by teachers); non-structured learning resources; collaborating with other students; and discussing ideas with their teachers. Structured learning activities involved putting time and effort into studying textbooks books and other teacher-provided materials, working on assignments or studying for tests and using library resources. Non-structured learning resources included using email or online forums, ideas from other courses, asking questions or contributing to discussions, or using an LMS. Collaborative learning includes all aspects of working with other students, and students discuss with their teachers ideas, assignments or future careers (see Table 2). Students rated how typical these behaviours were of the student on a six-point scale (0: Not at all typical, 1: Not very typical, 2: Not typical, 3: Moderately typical, 4: Very typical, 5: Completely typical).

Students are typically high on structured learning activities and non-structured resources and lowest on discussions with teachers.

Table 2:

Ways of engaging

Modes	$\bar{x}$ (*s*)	95% confidence interval	
		Lower	Upper
Structured learning activities	3.1 (.71)	3.01	3.22
Non-structured resources	3.1 (.78)	2.78	3.05
Collaborative learning	2.8 (1.2)	2.59	2.93
Discussion with teachers	1.7 (1.2)	1.55	1.88

Online engagement

Using the analytic capability of the LMS, student and teacher online activity was monitored and recorded. The main activities included using the online learning resources, quizzes, forums and up- or downloading assignments. These were recorded as the number of times the items were 'viewed'. Of most interest are the learning resources, quizzes and forums as these are directly related to learning activity. The up- and downloading of assignments was included because it was quite a large part of online activity but it has no direct effect on learning engagement.

Table 3 shows the mean number of views per person for each online activity. The percentage that the activity contributes to the total activity for the class is given in brackets. The mean number of views per person is useful for comparing the differences between classes in online engagement. The percentages are more useful for comparing student activities to that of their teachers.

Only three courses used quizzes, and forums made up a small part of the online activity. Most attention focused on learning resources. A comparison of teacher and student activity in learning resources (column 2) suggests that in five of the classes (2, 3, 4, 7 and 8) there is quite a close relationship, perhaps indicating that in some cases the more attention a teacher pays to a component, the higher the level of use by students. This relationship is less evident in classes 1, 5 and 6.

Table 3:

Number of online interactions

Classes	Learning resources # views per person (% of total views)	Online quizzes # views per person (% of total views)	Forums # views per person (% of total hits)	Assignment up/downloading # views per person (% of total hits)	Total interactions per person
1:Students	123 (57)	74 (34.5)	13 (6)	0	215
1:Teacher A	1007 (90)	14 (1)	17 (1.5)	0	1115
2:Students	68 (71)	0	18 (20)	6 (7.2)	93
2:Teacher A	516 (80)	0	50 (8)	0	642
3:Students	76 (71)	0	8 (7.7)	18 (17)	107
3:Teacher B	719 (73)	0	89 (9)	127 (13)	972
4:Students	104 (78)	0	3 (2.5)	18 (14.1)	133
4:Teacher B	1251 (68)	0	54 (2.9)	441 (24)	1820
5:Students	82 (70.7)	0	6 (5.2)	23 (20.2)	116
5:Teacher B	463(47.7)	0	80(8.2)	362 (37.3)	905
6:Students	102 (62)	0	12 (7)	40 (24)	180
6:Teacher C	437 (38)	0	71 (7)	577 (51.3)	1123
7:Students	207 (39)	294 (55.4)	6 (1.1)	18 (3.5)	530
7:Teacher D	357 (32.5)	420 (38)	41 (3.7)	28 (2.5)	872
8:Students	331 (33.8)	516 (52.6)	93 (9.5)	30 (3)	980
8:Teacher E	1869 (35.3)	2057 (38.7)	777 (14.6)	525 (9.9)	5303
9:Students	62 (55.3)	0	49 (44.6)	0	111
9:Teacher F	Figures not available				

Classes are identified by a number, teachers by a letter. Teachers D and E taught the same course at different locations; teachers C and F taught similar courses.

Pattern of engagement: Online

The patterns of engagement over the semester (see Figure 1) show large differences between teachers and students. Teacher engagement is heavily focused on the first week, mainly around uploading resources, and it drops away sharply for the rest of the semester.

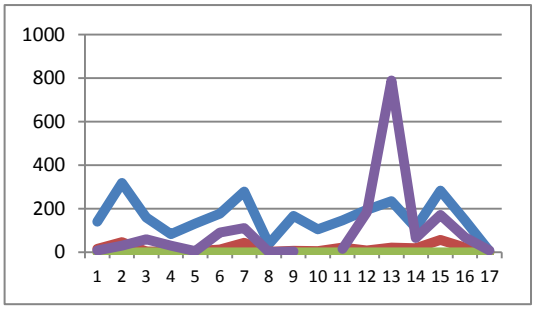
Student levels of engagement are driven strongly by the timing of assessment activities, and this can be seen in spikes of engagement around assignment due dates. Their engagement is highest for accessing learning resources. Where online quizzes were offered, there were much higher levels of engagement by students. Classes 8 and 9 both had a large number of assignments (online open-book quizzes) spread evenly over the whole semester. This resulted in high and sustained engagement.

Figure 1: *Graphs of student and teachers online engagement over the semester*

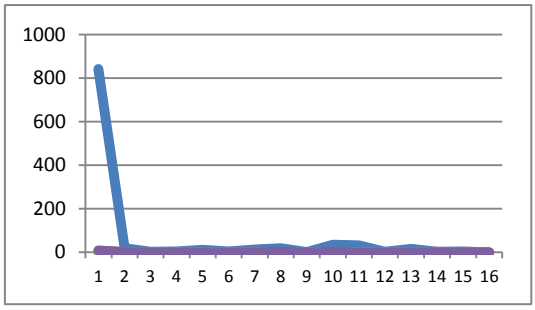
LEGEND
Learning Resources
Forums
Assignment up/downloads
Quizzes
Y-axis = Number of views
X-axis = Weeks

Please note the scales on each graph vary considerably.

Course 1



Teacher A



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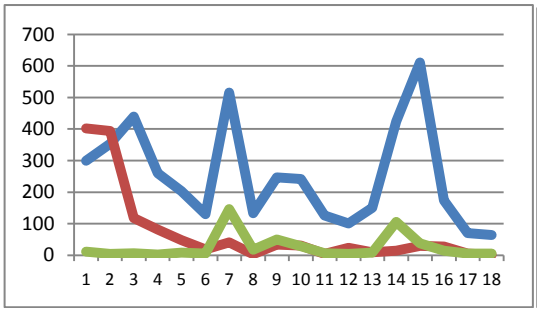
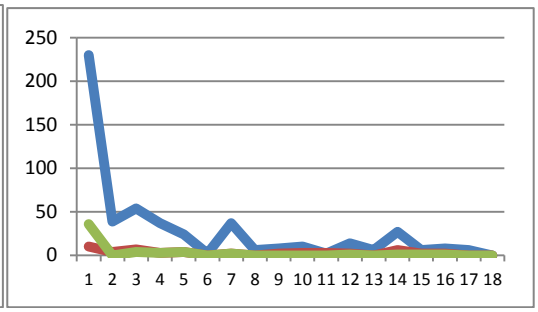


Teacher A



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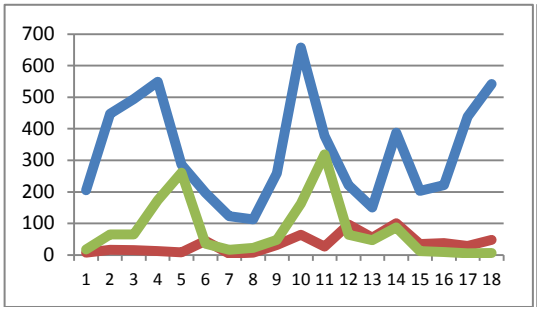
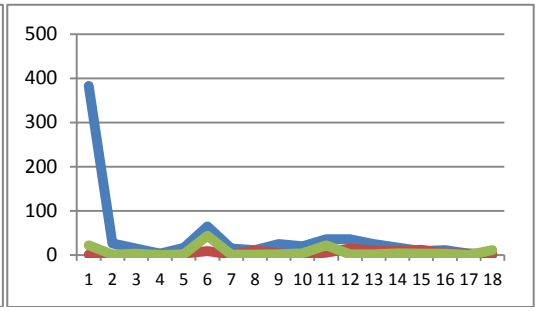


Teacher B



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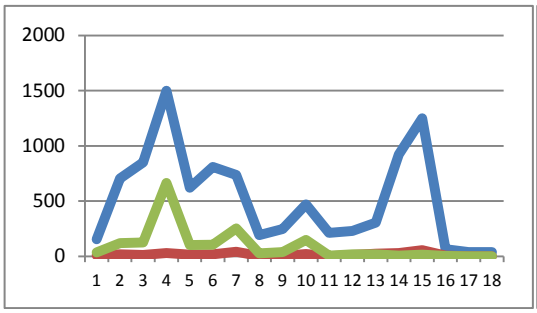

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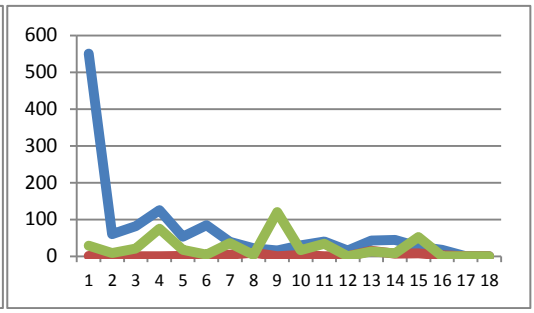

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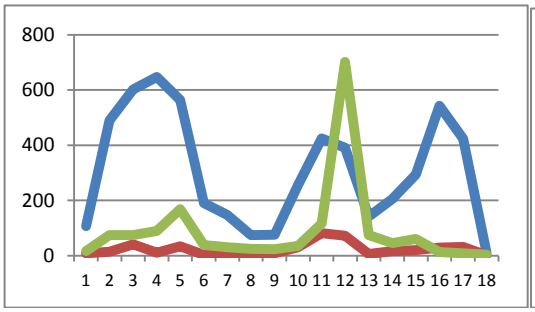

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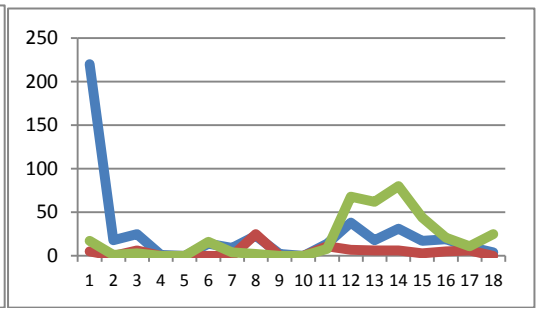

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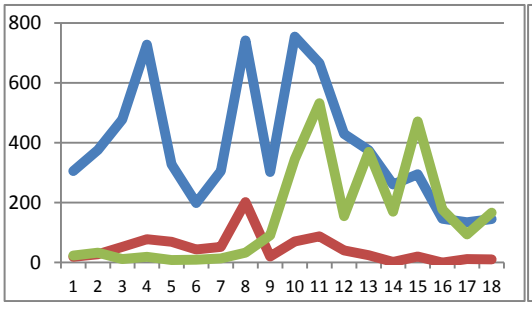

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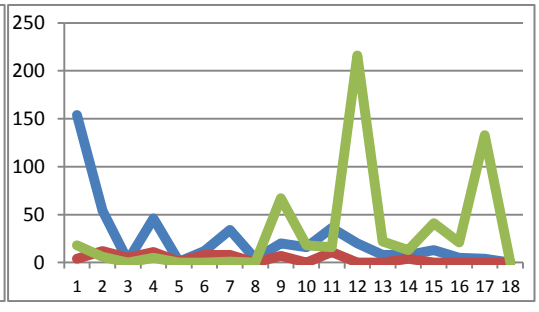
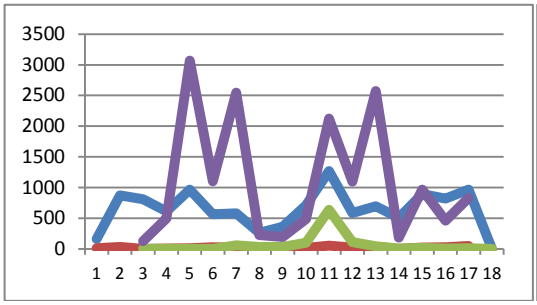


Course 7



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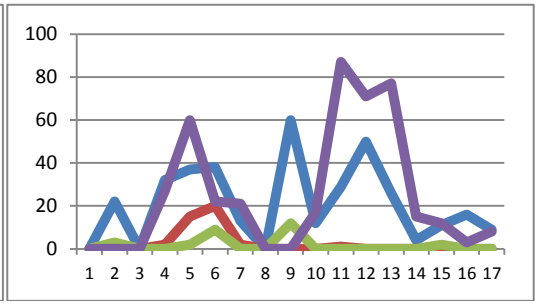
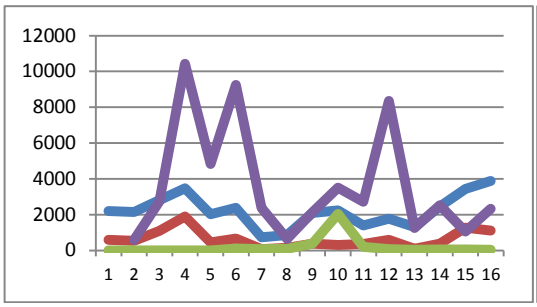


Course 8



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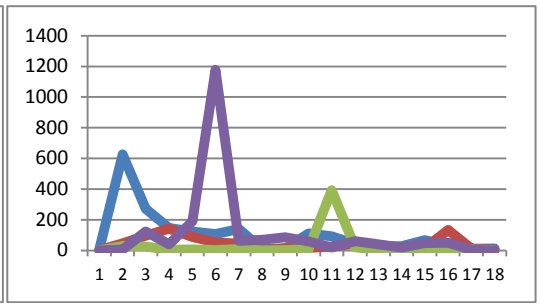
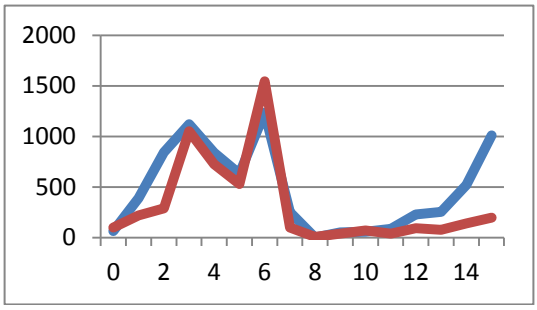


Course 9



Teacher F: data not available

Note: for this class includes resources and quizzes

Patterns of engagement: Self-reported engagement

Students' self-reported levels of engagement were measured at the start of the semester and then again at the end. Paired t-tests were used to measure changes (see Table 4). Bonferroni's correction was used to calculate an alpha level of 0.01 to counter the danger of a type I error using multiple t-tests.

The level of collaboration with other students and engagement in structured learning activities was the same at the end of the semester as it had been at the beginning. However, by the end of the semester there was a small drop in the number of student discussions with teachers and the use of non-structured learning resources.

Table 4:

Changes in student self-reported levels of engagement at the start and end of the semester using paired t-tests

Engagement type		$\bar{x}$	Std Error	t-value	Df
Structured learning activities	Start	3.30	0.06	No difference	
	End	3.17	0.07		
Discussion with teachers	Start	1.98	0.11	2.08	127*
	End	1.72	0.11		
Collaborating with others	Start	2.85	0.09	No difference	
	End	2.80	0.12		
Non-structured learning resources	Start	3.24	0.09	2.80	124*
	End	2.99	0.06		

* $p<0.01$

The effect of online engagement strategies on student online engagement

The online components of each course in the study were evaluated for the use of the 10 engagement strategies by two independent reviewers. There was a high degree of inter-rater reliability (90%). The evaluation sheet used a detailed list of aspects of the 10 strategies and each of these was rated using a four-point scale: 0 (not present), 1 (minimal presence), 2 (adequate presence) and 3 (good presence). An overall score was obtained for each of the 10 strategies for each course. These scores were then collapsed to two categories of minimal (or absent) or well-developed.

Teachers differed in the number of engagement strategies they used well, but all teachers used at least one well-developed strategy. For each engagement strategy, students were divided into those who had been exposed to a well-developed strategy (high) and those who had experienced a minimal or no strategy (low). These groups were then compared for their levels of online activity.

Paired t-tests were used to measure the effect of using online engagement strategies on the level of student participation in three online activities (see Table 5). Bonferroni's correction was used to calculate an alpha level of 0.003.

In all cases, the presence of a well-developed strategy was associated with a higher mean usage than those with minimal strategies. The strategy with least difference was that of re-engaging, which probably reflects the reality that only small numbers of students had reason to be affected by this engagement strategy.

For online learning resources the strategy that seems to make the biggest difference is the primer. Forums were most affected by social presence and challenging authentic tasks and quality feedback. The figures for quizzes suggest that primers are particularly important but all other strategies also play a part.

Table 5:

The difference in mean number of views by students in online activities when teachers used either a minimal (low) or well-developed (high) engagement strategy

	Strategy used	$\bar{x}$ views	Std Error	t-value	df
Engagement Strategy: Primer to capture student attention					
Online learning resources	Low	102.31	1.45	29.31*	92
	High	309.22	6.90		
Online forums	Low	44.58	2.05	10.48*	171
	High	83.31	3.07		
Online quizzes	Low	19.38	3.42	29.88*	94
	High	469.74	14.67		
Engagement Strategy: Social presence online					
Online learning resources	Low	99.8	2.4	10.77*	346
	High	171.2	6.2		
Online forums	Low	8.9	0.29	76.8*	539
	High	93.2	1.0		
Online quizzes	Low	32.3	5.5	7.8*	347
	High	150.7	14.2		
Engagement Strategy: Challenging tasks & quality feedback					
Online learning resources	Low	87.92	0.96	15.13*	304
	High	176.43	5.7		
Online forums	Low	9.02	0.32	46.9*	310
	High	87.11	1.63		
Online quizzes	Low	2.64	0.86	11.5*	290
	High	168	13.3		
Engagement Strategy: Organisation & structure					
Online learning resources	Low	89.99	1.86	11.88*	533
	High	146.22	4.35		
Online forums	Low	13.45	0.47	21.1*	473
	High	59.82	2.13		
Online quizzes	Low	6.28	2.01	10.6*	468
	High	111.61	9.67		
Engagement Strategy: Re-capturing engagement					
Online learning resources	Low	104.89	2.82	8.31*	447
	High	157.45	4.355.65		
Online forums	Low	9.32	0.35	36.58*	331
	High	81.13	1.93		
Online quizzes	Low	41.42	6.56	6.04*	456
	High	127.34	12.61		

* $p < 0.003$

The effect of online engagement strategies on student self-reported engagement

Although the self-reported engagement measure was a more general measure of engagement than just online, we were interested to see if the development of good online strategies had a broader influence on student engagement than just online.

Table 6 presents the results of t-tests to examine the difference in student engagement between students who had experienced minimally developed engagement strategies and those who had experienced a well-developed one. While not as marked as for online activity (Table 5), differences could still be detected. Bonferroni's correction was used to calculate an alpha level of 0.003.

Teacher perception of engagement in the classroom

It was not possible to directly observe and measure engagement in classrooms the way we had with online learning sites. We used the alternative approach of interviewing teachers using semi-structured questions to explore their approaches to teaching and how these were applied to the particular courses under review. Content analysis of the transcripts for common themes indicated four major areas: classroom engagement levels; classroom management; engagement strategies; and pedagogical design issues.

Classroom engagement

You can't force people to participate (Tom)

Teachers reported that a significant portion of enrolled students did not attend class on a regular basis. For some classes, attendance levels were as low as 25-30 *per cent*. The highest levels were about 70 *per cent*. Most noted that attendance was higher at the start of the semester and this dropped sharply at the first assignment then steadily, with especially low attendance when assignments were due in related courses. The level of attendance was estimated to be about the same at lectures and tutorials. One teacher found that international students were high amongst the non-attenders but they struggled to explain why this was so.

There seemed to be an underlying belief by some teachers that this form of 'self-selection' was not a bad thing because the remaining students were 'good'. However, one unexpected consequence in classes with high dropout rates was that grades tended to be higher than usual, giving a narrow range of marks. This insight is reflected in Figure 2, which shows that higher dropout rates are associated with fewer lower grades.

Table 6:

The difference in means of self-reported levels of engagement between students exposed to a minimal (low) engagement strategy and those to a well-developed (high) strategy

	Strategy Use	Mean	Std Error	t-value	df
Engagement Strategy: Using a primer to capture student attention					
Structured learning activities	Low	3.10	0.16	No difference	
	High	3.11	0.05		
Discussion with teachers	Low	1.55	0.24	No difference	
	High	1.74	0.08		
Collaborating with other students	Low	2.13	3.288	2.61*	230
	High	2.84	0.009		
Non-structured learning resources	Low	2.88	0.07	2.28*	227
	High	3.25	0.14		
Engagement Strategy: Social presence online					
Structured learning activities	Low	2.95	0.07	3.17*	226
	High	3.28	0.07		
Discussion with teachers	Low	1.56	0.10	No difference	
	High	1.88	0.12		
Collaborating with other students	Low	2.58	0.12	No difference	
	High	2.93	0.12		
Non-structured learning resources	Low	2.95	0.09	No difference	
	High	2.90	0.08		
Engagement Strategy: Challenging tasks & quality feedback					
Structured learning activities	Low	2.95	0.06	3.50*	226
	High	3.31	0.79		
Discussion with teachers	Low	1.55	0.10	2.31*	230
	High	1.92	0.12		
Collaborating with other students	Low	2.58	0.11	2.18*	230
	High	2.96	0.13		
Non-structured learning resources	Low	3.00	0.10	No difference	
	High	2.85	0.08		
Engagement Strategy: Organisation & structure					
Structured learning activities	Low	3.00	0.05	6.15*	226
	High	3.89	0.11		
Discussion with teachers	Low	1.55	0.08	5.32*	230
	High	2.70	0.23		
Collaborating with other students	Low	2.59	0.11	No difference	
	High	3.00	0.13		
Non-structured learning resources	Low	2.88	0.19	No difference	
	High	3.21	0.06		
Engagement Strategy: Re-capturing engagement					
Structured learning activities	Low	2.94	0.06	No difference	
	High	3.38	0.85		
Discussion with teachers	Low	1.58	0.09	No	

	High	1.92	0.13	difference
Collaborating with other students	Low	2.59	0.11	No difference
	High	3.00	0.13	
Non-structured learning resources	Low	2.87	0.10	No difference
	High	3.01	0.08	

*P<0.003

Teachers offered a range of explanations for non-attendance. The most common reason given was that the provision of too much material online allowed students to believe that they did not need to attend class. A number of teachers indicated their preference for reducing the amount of material online to improve attendance, but often felt constrained by student pressure. Selective attendance was noted when students would leave class immediately after a 'lecture' session to avoid taking part in exercises and activities designed to give students the opportunity to actively process the new knowledge. This behaviour seems to reflect a belief in some students that learning is about collecting factual information to build a body of knowledge rather than actively constructing knowledge.

Physical non-attendance was one way of failing to engage, but students' non-engagement manifested itself in a number of other ways. The influence of PowerPoint handouts on student engagement was argued from two different viewpoints. Many teachers felt that they minimised engagement. When the handouts contained the complete presentation, students felt no need to write anything down. In fact, some students came to class without pens or paper (and no electronic means of recording information). They seemed to take the view that if an idea was included on PowerPoint, it was important, and additional ideas or examples presented by the teachers were irrelevant, and therefore there was no need to pay attention to them. Additionally, teachers felt that not writing notes increased the passivity of students, as they were not actively processing the content of the class, thus reducing the value of the class to the student. Other teachers argued that providing the slide handouts freed students from madly writing everything down and allowed them to focus on listening to what the teacher had to say. One teacher (Jill) produced PowerPoint handouts with blanks in an effort to force students to attend class. She noted, however, that a proportion of students still did not attend.

Students were also observed going to tutorials with no writing materials. Even when the teacher provided writing materials and handouts that simply required boxes to be filled, students failed to complete the task. This type of behaviour was noted in several different courses and caused frustration for teachers who were later emailed for information that should have been collected in class.

The fall-off in attendance as the semester wore on was also attributed to boredom and or tiredness. One teacher (Mark) who experienced high levels of online engagement in the first half of the semester, with a large drop-off in the second half, was told by a group of students that the first six to eight weeks had been at such a high level of intensity that they were unable to sustain it for the

whole semester. They continued with the classes but reduced their online involvement. The teacher concerned felt that this was also partially because the number of quizzes and activities provided in the second half of the semester was substantially smaller than the start.

Some teachers felt that non-attendance resulted from student attitudes: "they're just lazy bums" and "they think they don't need to come to the lectures" (Tom). Another comment related to students never having to face the consequences of their behaviour or non-performance at high school and bringing this attitude to university.

Finally, it was suggested that very shy students seemed to hold back from fully engaging in class. This was particularly noted to be true of students for whom English was a second language. One explanation put forward was that these students were not always able to follow the dialogue in class, were self-conscious about their ability to speak English, and because they were often mentally translating to their own language, were not able to formulate responses in a timely manner.

Where classes were large, students were reluctant to ask or answer questions. As one teacher said, "nobody wants to make themselves look like a twit in front of a full class" (Tom). But, without a vibrant dialogue between teacher and students, lectures, and even tutorials, can be dry and monotonous. Teachers also felt a lack of interaction in the classroom negated many of the potential advantages.

Teachers expressed surprise, concern and frustration at the various ways students failed to engage. Having students walk out of class had a substantial impact on teacher feelings. They expressed shock and bewilderment, and felt that students were short-changing themselves. This was particularly true for one teacher when a group of students made obscene gestures as they filtered out.

Classroom management

The classroom is not a democracy, it's just not!

The major issue for classroom management was dealing with large groups of students. This was true for lectures, but particularly pertinent for tutorials: "having a large group for tutorials I don't think worked quite so well" (Helen). When classes are large, controlling the students and the lesson become enormously difficult "with large classes I'm sure there are people out there that manage them better than I can" (Helen).

In a large class the first challenge the teacher faces is being heard above the noise. This can become physically tiring for teachers who "end up shouting all the time in the big groups to be heard above people who think they can talk because they're anonymous" (Tom). Students were also often ruder in large classes so controlling the trajectory of the lesson becomes much more difficult: "So, I feel like I can't control the classes to the degree that I want to in order to enable them to be able to do what they can do" (Tom). This is compounded in

tutorials where monitoring student progress, and whether they are actually working and not gossiping, can take up a substantial amount of time.

Once the teacher has their attention, "warming them up" (Jill) in large classes is much slower than in smaller classes as students are much more reluctant to speak or draw attention to themselves for fear of looking silly. "The first group, which was very big, took a long time to warm up, you know, they wouldn't [engage]. The second group, which was really small, where they were actually forced to participate went really well and we all had a good laugh" (Tom).

Trying to break students up into smaller groups presents another set of problems. As one teacher noted "where you've got such a big class it's very difficult to break them up into groups which are going to work" (Tom). Who decides the composition of the groups? This was an issue that several teachers grappled with. One teacher felt she did not have the "power" to tell students which group they had to work with. Others debated the benefit of self-selection versus teacher allocation, but most teachers took the self-selection option as being the one that would get greater student "buy-in". The major problem with this approach was found to be uneven group sizes, groups that were homogeneous (negating the major benefits of collaborative learning), and students choosing their friends so they were often gossiping rather than being task-focused.

Student engagement

I don't know if I'd necessarily go out of my way to make them interested in it (Helen)

Getting students engaged

The first stage of engagement involves two components: primers and social presence. Primers are devices or strategies to spark curiosity, interest and relevance in the subject at the start of the course, while social presence includes the teacher's enthusiasm and the extent to which students feel a part of the class and the discipline. In the classroom these two were closely intertwined.

Teachers gave relatively little thought to strategies for engaging students. Most suggested that they used relevance; for example, explaining how the course fitted into their overall programme or how the skills learned would be useful in their work, but it was done off the cuff rather than as a carefully thought out strategy. Some teachers used their own backgrounds and anecdotes to connect with the personal experiences of the students. A similar strategy employed by one teacher (Jill) was to use the start of a lecture to build the relationship with students, for example, talking informally about a topical issue and inviting students to express their views. Another teacher (Peter) tries to sell students on the idea that the class was a joint venture by both parties. Generally, teachers did not get hugely enthusiastic about this issue, which is summed up in the following quote:

…it's fairly much business as usual. I think what I'll do is I go in there and I'll outline the course so I'll outline to the students my expectations, what they have

to do, and give them the sort of advice that would be useful in the course, but I don't think I necessarily would go out of my way to you know kind of, attract the students to the course because at the end of the day they've made that call (Helen).

Two unusual devices were used. The first came from a teacher who was related to a famous sportsperson (and shared the same surname, which was readily recognised by students). He explains this connection and his own passion for his own car ("my happy place") at the first lecture, and then continues to use it as the vehicle for teaching all of the major concepts and principles in his course. The second device was the use of a piece of classical music that was playing when the students entered the classroom. The teacher explains that research has demonstrated that classical music improves learning, and then uses this to prompt a discussion on research and how to establish the validity of research claims.

Most teachers talked about actively getting students involved in the class by encouraging them to ask questions: "I tend to think if anything perhaps the main thing I try to strive for each semester is to get more and more students kind of involved and ask questions if they're not sure about something" (Helen). They conceded that this was difficult in large classes "with the bigger group it was difficult, nobody wanted to make themselves look like a twit in front of a full class" (Tom), and where a small number of students dominated the interaction:
I'm deliberately picking on students – particularly the ones in the back – to try and give me an answer. And I always find, of course, the adult students, especially adult female students or any students sitting on the front row or the front two rows will be quick to answer. So I'm deliberately telling them to zip it (Jill).

Maintaining engagement using motivation
Two types of strategy that work by motivating students are the use of challenging, authentic tasks and providing personal, timely and quality feedback.

Challenging, authentic tasks
Two teachers made specific mention of the challenging nature of their courses. The first described how her course was a combination of theory and problem solving. She believes that the problem solving, which is done in the tutorials, is essential as it is only when the students work through problems that they realise whether or not they understand the material. When students appear to be struggling she invites them to "[c]ome to the board, we will solve this together" (Maria) and she works with the student to solve the problem. The teacher closely monitors student engagement with the problems: "it's not a paper you can hide in". Students found this course "one of the hardest papers they've done but one of the most rewarding ones".

The second teacher took the opposite approach. She had a very small number of lectures at the start that mainly dealt with administration and included a couple of guest lecturers. There was no structured lecture programme either online or in the classroom. Students were told to form themselves into groups, find a local

business to work with, and complete a project with that business. This teacher took a completely hands-off role to avoid "micro-managing" students and to give them a taste of the "real world". Very little structure is provided and students worked "phenomenal hours. I've had students give me feedback where they've done all-nighters". The students also grade other members of their group as part of the assessment.

Feedback: personal, timely and quality

Most courses had tutorials with exercises that provided students with immediate feedback about their performance. The teacher who worked problems out with students on the whiteboard was concerned during the tutorials to identify any student who was struggling and to work with them on a one-to-one basis. Three courses used online quizzes and the teachers felt the rapid feedback was motivating.

Another kind of feedback mentioned by teachers was responding to student queries. For one teacher this was particularly important:

I believe when I come to work each morning if someone has taken the time to ask a question, I answer it then and there. I don't have a set time each day where I sit down and say 'right I'm only going to do x number of questions and any questions after that will not be answered'. I tend to find my personal philosophy [is that] I answer questions inside, as well outside, of work hours [and] I think that it really goes a long way towards students developing a kind of trust (Helen).

She justifies her attention to student questions because she believes that if "you give them a fairly quick response, then they'll feel like they can then approach you, [which can be a] barrier…I think they should [be able to] ask if they're not sure and then that way they get confidence" (Helen). For this teacher feedback to students was an opportunity to build a relationship with them and to break down barriers that could potentially hinder their learning.

Helen relies heavily on multi-choice questions for assessment. While she feels concerned about the limitations of this form of assessment, she justifies it as making the best use of her time:

I tend to believe my time is better [spent] answering questions and working on how to solve problems and understanding the content; that's really important and I don't take the view that marking is what I should be doing. I'm not saying I don't like marking but I don't think that's an effective use of my time so a lot of my effort has gone into trying to find different types of assessment whereby I can kind of minimise the marking and administrative time required (Helen).

Another teacher posts all of her responses to questions from individual students online so that everyone has the benefit of the answer. These responses are supplemented with additional teaching notes. This teacher also makes a point of personalising her responses to students "as if I'm talking to people" and by using

students' names. When students start to use her name in their questions, then she feels she has made a connection.

Maintaining engagement through organisation and structure

Most teachers described their courses as having a clear structure that was carefully followed through the semester and for each lecture. Three teachers, however, explained that they preferred to be very flexible, so that they could adjust the content of the lecture in class. This involved skipping slides, jumping back and forth between slides or bringing in new material. One of these teachers even colour-coded his slides to facilitate this process: "Timing things doesn't work out as simply as that so a lot of it was hop-making…I was very aware that we had certain stuff we needed to get through" (Peter).

Despite complaints from students, these lecturers felt that this type of flexibility was an enhancement to their teaching. As one commented:

because our students are very diverse…And I think if I had gone in there quite rigidly either doing just lectures or just doing presentations or even having a very, very strict schedule, it wouldn't have worked (Peter).

It is perhaps not a coincidence that these teachers own to being great talkers. Indeed, one explained that he would regularly run out of time so the activity scheduled for the second part of the lecture had to be left out.

Another teacher would prefer to have this flexibility but has changed her approach in response to student feedback:

Class students don't like the liberty of the lecturer then to change the pace and skip slides. You give them these slides and then you realise that 'oh, there's slightly more here, why don't I provide another example by spending more time here?', but then you run out of time and then you skip the next four slides and then the student says, 'But you didn't do this slide'. So, by giving them slides up front you restrict yourself to follow in a specific order – and that's not where the value added of my knowledge comes in because they can get this out of the text book. They don't need me for it; they need the lecturer to identify maybe where there's a problem, provide additional examples that they don't find in the textbook and just differs from class to class. You come in and some are very good in that area and it works, but these are decisions you make on the spot during class and if you give them slide handouts, you remove that flexibility. So, if it wasn't for the constant complaints and an expectation, no, 'Everybody else gives us lecture notes, why don't you?', I would still prefer not to give them lecture notes (Maria).

Re-engaging students: monitoring, personal contact and negotiated study

Just book an appointment with me (Peter)

In the main, teachers did not actively monitor student engagement: "To be honest I haven't gone out of my way you know to target individual students"

(Helen). They felt that their demeanour in class – "I hope I seem inclusive in class" (Peter) – and regular invitations to contact the teacher if they had problems – "before each assessment is due I send at least one reminder out and say 'hey, by the way it's due, go in it have a look and get questions asked'" (Jill) – was enough to encourage those students who needed help to seek it. Several teachers mentioned the importance of a good relationship with students to encourage them to meet with the teacher when they had a problem: "I try to touch base with different sorts of people in the breaks" (Peter). This teacher became concerned very early on about engagement by international students and "so I made an effort in the first break to go up to all these international students".

Teachers mostly waited for students to take the initiative, as described by Jill about students who came to her with problems: "And so they either came to me as a group or individuals came to me squealing or concerned about they felt they had been persecuted…Why did they get such bad marks? And so I'd explain to them how the assessment worked".

One teacher actively monitored student engagement from an early stage. He explains the process he used:

The first thing that we did in this paper was we asked students to submit the first part of an assignment in week 4. And that was probably the strongest thing that identified students who were withdrawing. I sent an email to all students that had not done that submission within two to three days of the submission being due, saying 'I noticed you haven't submitted, please contact me if there's a problem'. And from that about six students out of [about] 15 sent me an email almost straightaway saying 'terribly sorry, my life's falling apart, this is what's going on'. And what I did was I gave most of those students a retrospective extension; they still lost some marks because it was retrospective but it was minimal (Mark).

This teacher went on to say he regretted not using the online reports of engagement to monitor engagement later in the semester, as he would have responded differently to a drop in engagement at this time.

Pedagogy

I still like the idea of a textbook; textbook is actually all you need. (Peter)

Functions

Lectures, tutorials and online environments were seen by most to have quite distinct functions. Lectures were used to teach theory, and while they could be enlivened with examples, theory is thought by teachers to be dry and abstract but "they're here to learn about theories as well as everything else, that's what university's about, so they've got to have that component [lectures]" (Tom).

Tutorials were seen as the opportunity for students to actively engage with the theory at an applied level, "[b]ut then it has to come alive for them as well. To be

seen to be applicable in some very direct way" (Tom). The same point is made by another teacher:

There's actually quite a separation between the lecture and the tutorial. And the lecture follows the textbook; it's purely knowledge and theory-based, going along closely with the textbook and the slides provided by the publisher. Then there's the tutorial; this is purely applied and problem solving (Maria).

The main function of the online site for most courses was to be a central repository for the resources, "[s]o everything was online" (Peter). Teachers would refer students to the online site to find information and resources for all aspects of the course from administration to assessment requirements to help with learning. Students were urged to check the online site before asking questions of teachers.

All teachers put PowerPoint slide handouts online for students to download before the class – though there were mixed feelings about this. Maria explains that she had previously refused to provide these:

But students used to complain, and always said, 'Why don't we have lecture notes online?' So I finally put them up. But I'm not sure it's beneficial, I don't, because I follow closely the text books so if they want to read up – that's what the text book is for. By giving them the notes they just sit there and are so easily distracted because, for the lecture itself, they're just going through those lines.

Other teachers argued that the practice of providing PowerPoint handouts encouraged students to not attend class or to regard only the information on the PowerPoint slides as being of any importance.

The ease of putting resources online and the proliferation of web-based resources such as YouTube seems to be an important factor in seeing the online learning site as a repository, as described by one teacher:

…it was very easy to put up the core material, which is – the textbooks supplied slides. YouTube is very good; I'm finding more and more stuff on YouTube, where there's either a video that might explain a point, might have an advert. It might have a discussion or something like that on YouTube that I could either put on [online]. And if it's like the second degree or third degree away from the subject or it doesn't absolutely nail what I want to say, then I'll put it on [online] and say, 'This is additional resources or additional material to read' (Jill).

This teacher also included a substantial portion of material from another course on her online site. These materials were not modified for her class though she did explain to students that they had come from another course.

Another teacher was also very keen to put lots of material online. He felt this reduced pressure on him to cover everything in lectures. He could focus on areas of particular interest and give the topic more depth:

…and I think it comes back to what you've been talking about having multiple avenues to collect information…so they've got a textbook there, which is very good. And then I've got PowerPoint slides that are complimentary but not the same; well actually if you read all those and understood them, you'd actually know the topic as well, so we've already got two points that no matter what I do in class technically there's the information there… And I think takes a lot of pressure off me and the class to actually get down and do the stuff that they want to learn about, I suppose. And having it all online means that I don't feel as if I have to point [things out in the] lecture (Peter).

Other teachers took the view that too much content online was a problem as it gave students a false sense of security and discouraged them from attending class; in addition, too much material had the potential to confuse students.

All of the courses in the study used forums, but these were mainly used as one-way communication from the teacher. Very few students used the forums, despite encouragement from teachers.

Four of the courses used online quizzes. All of these generated high levels of engagement by students.

Modifying or developing a new course

A number of teachers expressed strong views on whether to use someone else's online material and modify it, or develop their own when considering adding an online component to their course. On the one hand, some thought they could learn faster and develop materials faster if they could build on someone else's work. Others felt that starting with a site from someone else resulted in a confused muddle.

The argument for a new development is described by Mark:

I decided not to copy the previous course; I decided to start from scratch. Because it was very easy just copying it from previous semesters [but] I thought we'd have ended up with a bit of a dog's breakfast here because we've just copied it and stuck things on. So I decided two, three, two semesters ago; blank sheet, I'll start from scratch.

An alternative view is offered by Jill:

It's that whole change, it's new, it's that whole, sort of like a 'Well, what do I put on there?' I remember back to when we first were introduced to it [using an LMS], I was one of the more vocal people to say, 'Well, what's somebody else done? Can you give us some examples?' and all they'd given us was some printed out examples rather than rolling over somebody else's website. I said, 'Look, I want the rolled over website so that I can, I'm not very creative per se, I like to hack and edit somebody else's stuff.'

All teachers recognised that there were different benefits in classroom and online teaching. As a repository the online environment did not suffer the time

and space limitations of a classroom. It was also regarded as an excellent mechanism for rapidly contacting all students: "the great thing about it is that you can put stuff in it that students can access anytime anywhere. I can broadcast out quickly out to students saying, 'Work change' or 'I've just found this' or 'Your results are now available'" (Jill). However, teachers also had reservations. Several teachers described themselves as "old fashioned", which was the inevitable introduction to a statement about their personal preference for classroom teaching:

I studied [a course by distance learning] and they were still using [an online site] and the teacher had so many sources where you'd find information, it was overwhelming to me. I had about six or seven separate sources and [the online site] was part of that, and rather than helping me, it just totally hindered me; I wanted a one-stop shop. And I think we're all aware of that and we're making [our online sites] a one-stop shop. I still believe that me sitting in front of you is powerful, more powerful. I know I'm old fashioned in thinking that but more powerful than something happening online. So I still feel as if I can make a difference to you sitting here more so than I can online. So I suppose because I have that belief I'm using the LMS as complimentary to the classroom (Peter).

Another teacher also felt that an online component could compliment the classroom, but had limitations:

I think it is [useful] but I think it needs to be in its place and I don't think it can replace classroom contact and individual argument and engagement with individuals in tutorials, I really don't. I think it's very, very useful like making announcements and making sure everybody knows that something is cancelled or something has suddenly been set up and for providing links to extra readings and APA interactive and so on. I think that's great, but it doesn't, it can't replace what the university experience is about. I wouldn't want to see computer-based learning and interaction replacing classroom stuff when you can have the classroom stuff (Tom).

One of the advantages of an online component was the recognition that it fostered multiple approaches to learning. The opportunity to answer student questions and make the responses available to all students was a major motive for using an online environment for one teacher. She was aware that in class the lecturer moves at one pace, which may be too fast for students who are too shy to ask questions at the time. Additionally, some points may not be fully covered in class. The online environment allows her to post additional teaching notes and write answers to student questions, so it extends the teaching in the classroom. Other teachers made similar comments, particularly in relation to international students who might struggle with language and pace.

Time

I suppose if anything, the biggest obstacle is time. (Helen)

While all teachers agreed that their online environments were easy to use, all explained their limited use of the online component was caused by a lack of time.

First, there were competing pressures from PBRF (the study was conducted in the final year of a PBRF round). Staff were under considerable pressure to use the last six to eight months before the close-off date for PBRF to generate research outputs that would count towards their grading. In all of the institutions involved in the study, the positions of LMS support staff were disestablished due to restructuring and the technical support promised to teachers was unavailable. Despite early enthusiasm, teachers in the study were only able to find time to make few of the recommended changes to the online environments. For example,

...and it's time more than anything… so the time commitment to the actual maintenance of the site; answering questions being available does take time and there's no doubt it does have an impact on your other responsibilities and commitments (Helen).

Teachers felt frustrated that they did not have time to learn to use the system properly or to be able to personalise it to reflect their approach to teaching and learning.

I haven't got enough time to learn how to use it properly. I think I'm only using maybe 20 or 30 per cent of what its real potential is for me as a teacher. And I know I need to sit down and really learn the system but I haven't had time to do more than emergency learning, which is not ideal for anybody and leads to problems…Some of the stuff that I've put together I quite like. Some of the stuff where I was kind of obliged time-wise to use more of other people's work than my own I'm not that happy with, not because it's not right but because I want to come with my own twist and I haven't been able to put my own twist on it (Tom).

Student perceptions of the quality of their learning experience

Data on student perceptions of the quality of their learning experience were collected from four sources. First, students were asked to identify which teaching components were most useful to their learning. They were then asked if they had ever considered dropping out of the course, and if so, why. Formal dropout rates were calculated for each course and compared to mean marks. Finally, in a focus group students were asked to reflect on their learning experiences.

Student attitudes to blended components

Students rated how useful these blended components were to their learning on a five-point scale between 1: not useful, and 5: extremely useful. Table 7 presents the results in order of descending usefulness.

Online presentation materials (*e.g.* teaching notes, PowerPoint slides) were rated by students as the most useful of all course components, and online messages from teachers and message boards as the fourth most useful component. All other online components were rated as less useful than all other non-online components. Feedback and face-to-face lectures or tutorials were ranked second and third most useful respectively.

Table 7:

Usefulness of blended components to student learning

Components	$\bar{x}(s)$	95% confidence interval	
		Lower	Upper
Online presentation materials (*e.g.* teaching notes, PowerPoint slides)	3.95 (0.99)	3.83	4.06
Assignment feedback	3.79 (0.99)	3.66	3.92
Face-to-face lecture or tutorials	3.74 (1.16)	3.59	3.89
Online messages from teachers, message boards	3.66 (1.05)	3.52	3.80
Course structure & organisation	3.65 (0.86)	3.54	3.76
Classroom activities	3.59 (1.02)	3.46	3.73
Face-to-face individual contact with the teacher	3.55 (1.14)	3.40	3.70
Online tests and quizzes	3.28 (1.2)	3.01	3.41
Online student forums, discussion groups and chat rooms	2.73 (1.25)	2.57	2.89

Online tests and quizzes were used extensively in two courses and to a lesser degree in two others, which may explain the low ranking. The two high-use courses also made substantially more use of online forums than other courses. When the means were examined for these classes only, the results in table 7a were obtained. These students rated online quizzes as the single most useful component. Student forums are also rated much higher.

Table 7a:

Usefulness of blended components to student learning

Components	$\bar{x}(s)$	95% confidence interval	
		Lower	Upper
Online tests and quizzes	4.25 (.90)	3.94	4.55
Online student forums, discussion groups and chatrooms	3.34 (1.28)	2.90	3.78

Only 3.5 *per cent* of students found the online learning environments difficult to use.

Dropping out

The numbers of students who formally withdrew from a course varied considerably across courses, though overall the rate was 15 *per cent*. Figure 2 charts the relationship between the dropout levels and marks from each course. Although too small a sample to be confident of the trend, there is a suggestion that courses with higher marks have higher dropout rates. Possibly, students who drop out are struggling with either the course work or course load, or less interested, raising the overall mean marks of the remaining students. Teachers who work hard to retain students may, therefore, have lower means. If this is the

case, then dropout levels may be a better measure of teaching quality than student marks or grades. However, further research with a larger sample is needed to confirm these results.

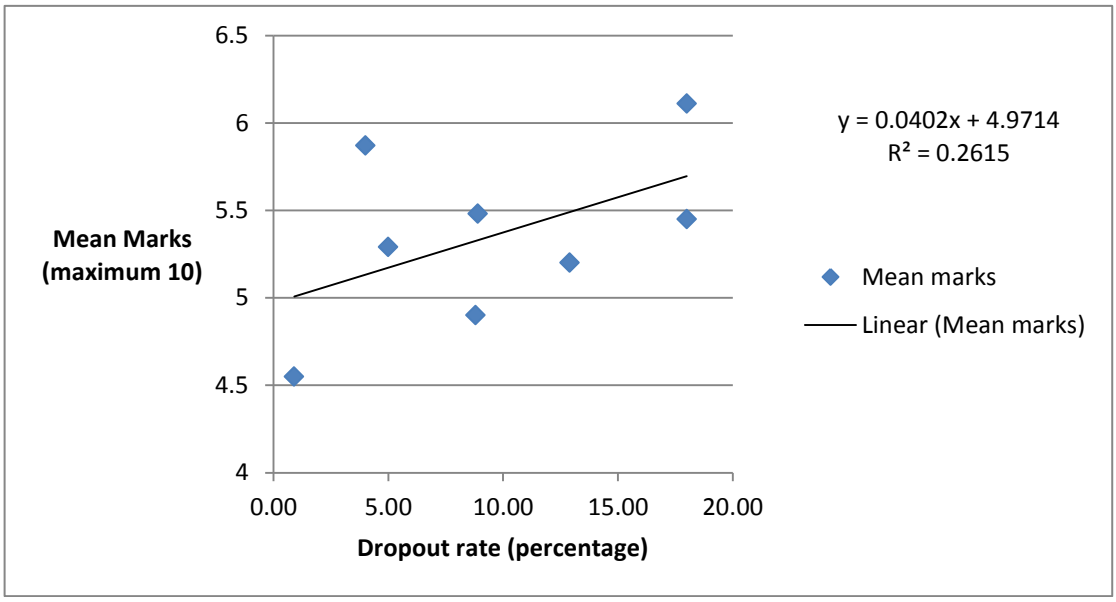


Figure 2: The relationship between the means for class marks and dropout rate

Reasons for considering withdrawing

At the start of the semester students were asked if they had either withdrawn or considered withdrawing from a paper in the *previous* semester, and if so, why. Almost 27 *per cent* answered 'yes' to this question. At the end of the semester under study we asked students again if they had considered withdrawing from this course and only 15 *per cent* answered 'yes'. We then asked why they had considered withdrawing.

Although fewer people considered dropping out during the semester under study, the reasons were similar in nature to those given for the previous semester. The top four reasons were the quality of teaching, the difficulty level of the course, becoming demotivated and the quality of the course.

a. The quality of teaching

The quality of teaching and teachers formed the largest group of comments for both semesters. A number of these comments were general claims about teachers 'not being very good', but of more interest were those that specified the issues. Several students commented on the non-supportive nature of their teachers, who wouldn't or couldn't provide the help needed. Other students found some teachers 'boring' especially when they simply read from the PowerPoint slides. Most worrying were comments about teachers who were 'rude', 'offensive', intolerant of their students' personal beliefs or 'scary' to students. There were only a small number of these, but the students affected felt that these attitudes diminished their ability to learn.

b. Difficulty levels and workload

A fair proportion of the students found their courses too difficult, and being in this position was stressful. Some commented that they 'stuck with it though'. A related issue was workload. Students felt that some teachers demanded too much effort and many complained about the lack of time, particularly for reading. One student felt the course was 'too easy'.

c. Demotivation

Quite a few students reported working hard but getting poor results. Their subsequent demotivation was sufficient for them to consider withdrawing.

d. Course quality

Courses were reported as being not relevant to student needs or of no practical value. This was particularly true of compulsory courses. Disorganised courses and those that lacked focus also discouraged students. Several courses were also described as 'boring' and 'not interesting'.

A small number of comments were made regarding a dislike of particular assignments (group work and oral presentations), feedback about the course from other students, hating a course but having to stick with it because it was compulsory, and work-study-life balance.

While it is not always appropriate to use numbers in the context of qualitative data, it was noted that while the number of comments regarding the quality of teaching were similar for the previous and the study semester, the number of comments about difficulty, demotivation and the quality of the course were considerably less for the courses in the study.

Student focus group

A small group of students volunteered to take part in a focus group. On the day some of these failed to show up, but five students from different classes spent an hour describing their learning experiences. They were asked about the experience generally and about the effect of specific engagement strategies.

a. Teachers

Students generally found their teachers to be approachable and supportive, but some noted that when going to see a teacher it was important to have thought out your questions ahead of time to get the best response. International students in particular described their teachers as approachable. They commented on the ease of arranging an appointment with teachers through email or after class.

One course had a guest lecturer who read out his PowerPoint slides. He was so boring that students commented about it to each other and agreed that none of them would answer his question in the exam.

b. Online

Students were very positive about the repository of learning resources they could access on their course's online environments. For example, the links to

other materials and sites such as libraries was highly valued as it increased accessibility and flexibility. One student commented, "It's easier to get information for example from library site or student data bases. So it's very easy…you don't need to go to university to get books from the library; it gives you better access, and more flexibility in getting that access."

While access to resources was valued, students sometimes felt overwhelmed by the amount of material and felt that they were expected sometimes to do too much reading. Despite the volume of resources sometimes being a problem, overall students found the courses well structured. They also liked being able to submit assignments online, which they found to be much more convenient than handing in the traditional hard copy.

The online site was described as an important contact point with teachers. For example, "it's a good place to come together, actually. The teacher puts some notes up and you can access it from anywhere, download it."

c. Collaborative learning

Students found being actively engaged in group work for learning (as opposed to evaluation) interesting and motivating. One student said it gave him a feeling of being "a part of the class", and others nodded their agreement with this.

d. Learning tasks

Students felt that the assessment workload was very high; however, when the assignments were interesting, they felt energised and they worked hard. When assignments were more mundane, the high workload tired and discouraged them. One student described a demotivating assignment that had been taken from a US textbook and that used US data. Students were asked to 'pretend' it was about New Zealand. He felt this was poor practice by the teacher and was not very motivated to work on it. However, this was an exception and most described assignments as "quite practically orientated and sometimes hard but quite useful".

While some students had good experiences of feedback, others felt that in general the feedback they received focused on minor matters and did not give enough information about more substantial issues. They described this as causing them quite a lot of frustration.

Students commented that they read online but preferred to print material for studying so they could read it carefully and highlight important points.

e. Learning support

When students were asked about 'student learning support centres', the most common response was that these places were often overloaded and getting an appointment usually took a long time, which did not always work with assignment due dates. However, when students met with these advisors they were described as 'very friendly' and 'helpful'.

Research Objective 4: To establish the relationship between student study behaviours and engagement in a blended learning context

Three types of student learning behaviour were measured: planning, persistence and procrastination (see Appendix A). These were then matched against online engagement, their self-reported levels of engagement in learning activities and their performance in a blended learning course. Correlations were used to determine these relationships.

Student study behaviours

Three types of study behaviour had been identified as influencing student engagement. Procrastination (leaving things to the last minute) was expected to have a negative effect. Both planning (organising and preparing for learning activities) and persistence (continuing effort in the face of difficulties) were expected to have a positive effect.

Students were asked to indicate their level of agreement using a Likert scale (1: strongly disagree, to 5: strongly agree). Student study behaviour is characterised by high levels of persistence and moderate levels of planning and procrastination (see Table 8).

Table 8:

Study behaviours

Modes	$\bar{x}(s)$	95% confidence interval	
		Lower	Upper
Persistence	3.8 (0.46)	3.78	3.87
Planning	3.2 (0.77)	3.16	3.31
Procrastination	3.0 (0.72)	2.90	3.16

Correlations

Students' study behaviours were examined to determine what role they played in student engagement and student performance (see Table 9). Students who procrastinate are less persistent, plan less and are less likely to engage in structured learning activities or discussions with teachers.

Students who plan their study are more likely to be persistent and engage in all four types of self-reported engagement, and to a lesser extent, in using online resources and quizzes. Procrastinators are less likely to plan or persist and are not as strongly engaged in using learning resources or talking to their teachers.

Learning outcomes (marks) are most strongly associated with self-reported engagement in structured learning activities and have more modest correlations with using non-structured learning resources, and with the three types of online learning activities. Marks are negatively associated with discussions with teachers, indicating that the type of student who most often seeks out teachers outside of class are those who are struggling and need help. One highly interesting association is that between using online quizzes and online learning

resources (r=0.78), suggesting higher overall levels of online engagement when both quizzes and learning resources are offered to students.

Research Objective 5: To determine effective methods of identifying students at risk of disengagement in a learning management system (LMS)

Both of the learning management systems (Moodle and Blackboard) in the study offered easy to use learning analytics for monitoring of student engagement. Most teachers chose not to use these. One teacher used the due date of the first assignment for identifying non-engagement. A personal email was sent to each student who had not submitted, noting that the student had not submitted and asking if there was a problem and could he help. Out of 15, six immediately responded and the teacher negotiated additional time. Even though the learning analytics had not been used, the teacher commented that the LMS was key to his ability to quickly identify who had not submitted and being able to send each student a personal email. At the end of the year this teacher expressed regret he had not used the LMS activity reports because when he examined a substantial drop in online activity in the second half of the semester, he realised he could have responded and turned that decline around.

One teacher used the activity reports to identify students and deal with them personally through emails. This teacher had the lowest dropout rate. Most teachers relied on students to take the initiative to ask for help. They seemed reluctant to actively monitor for disengagement, but the reason was not very clear. One teacher argued that the class numbers were too large and it was too hard to follow up with disengaged students. Another argued that the intimate nature of his classes made it easy for him to identify those who needed help and he would talk to them.

Table 9:

The relationship between student behaviours, self-reported engagement, online engagement and performance

	Structured learning activities	Discussion with teachers	Collaborative learning	Non-structured learning resources	Using online learning resources	Using online forums	Using online quizzes	Planning	Persistence	Procrastination	Marks
Self-reported Engagement											
Structured learning activities		0.43**	0.32*	0.45**	0.11	0.24**	-0.01	0.48**	0.47**	-0.40**	0.40**
Discussion with teachers			0.58**	0.47**	0.20*	-0.36**	-0.07	0.28**	-0.53**	-0.27*	-0.27*
Collaborative learning				0.56**	-0.19*	-0.17	-0.18*	0.35 **	0.32*	-0.21*	0.07
Non-structured learning resources					0.07	0.12	0.07	0.27**	0.25**	0.35*	0.25*
Online Engagement											
Using online learning resources						0.15*	0.78**	0.11*	0.09	0.08	0.24**
Using online forums							0.28**	0.26*	0.31**	0.08	0.20**
Using online quizzes								0.15*	0.21*	0.08	0.26*
Study Behaviours											
Planning									0.32**	-0.39**	0.05
Persistence										-0.37**	0.18*
Procrastination											-0.14*

Discussion

This study addressed two questions: what do students think about blended learning and what influences student engagement in a blended learning environment. The major findings are reported in answer to these questions.

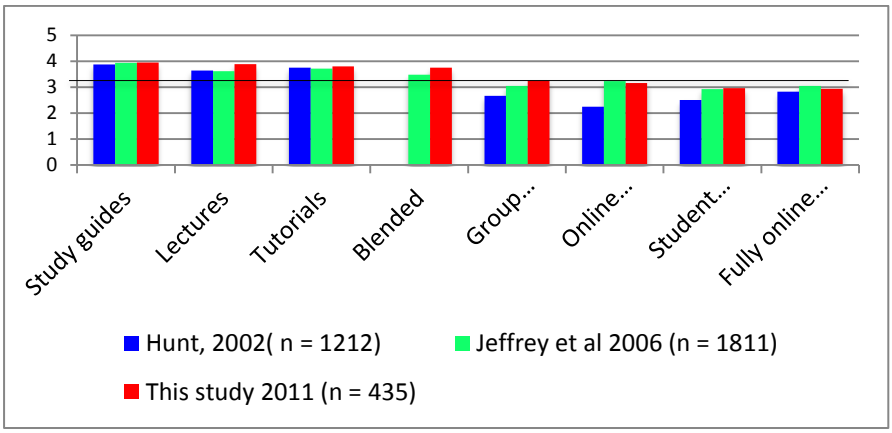
Attitudes to blended learning

Finding 1: Students value blended learning

Students showed a strong liking for blended modes of learning. This is a considerable change as previous studies have reported that traditional modes of teaching (printed materials, lectures and tutorials) were substantially preferred over all other modes. Here, traditional modes were only marginally more preferred than blended courses. Other modes, including group projects, online discussions, student presentations and fully online courses, were liked considerably less. Generally, these findings are consistent with the literature of the last ten years, which has found that students tend to prefer what they are most familiar with (Jones, Johnson-Yale, Millermaier, & Seoane Pérez, 2008). What is interesting in our results is the high preference for a blended approach, suggesting that rather than just a compromise between traditional and online, blended learning seems to be viewed by students as having value in its own right.

When we compared the results from this study with two previous studies in New Zealand in which the same questions were asked, we found some interesting trends (see Table 10). First, most modes have either remained at about the same level of popularity or have improved. Traditional modes (printed study materials, lectures and tutorials) remain the most popular. Group projects, online discussions, student presentations and fully online courses were all disliked in 2002, but by 2011 had improved their position to around the neutral mark, suggesting that teaching of these has improved. Blended learning was not measured in 2002, but between 2006 and 2011 it improved its position to be very close to traditional modes as being highly preferred.

Table 10: Changing popularity of teaching modes from 2002 to 2011



*The line at 3 indicates neutral, above sits liking for and below dislike.

Studies have consistently found a strong preference by students for traditional modes of teaching. A number of explanations have been offered. Sadler-Smith and Riding (1999) attributed such preferences to Knowles' (1990) distinction between pedagogy and andragogy. Students were found to be largely teacher-dependent (pedagogical), rather than self-directed and motivated (andragogical), and so tended to be more comfortable in a teacher-controlled learning environment. Further support for this view was provided by Hunt *et al*. (2002), who found that students high on dependent learning had a strong preference for traditional teaching modes, and Jeffrey *et al.* (2006), who reported that students preferred traditional teaching with which they were more familiar above other modes.

By contrast, technology-based teaching modes have not been popular with students. In 2002, Hunt *et al.* reported that students frequently experienced frustration with technical problems when using new technology. Others also found high levels of student dissatisfaction with technology, emphasising the frustration of learning in a technology-based environment, high levels of anxiety and confusion associated with ambiguous instructions (Allan & Lawless, 2003; Hara & Kling, 2000). In addition to problems with using technology, Jones *et al.* (2008) found that while 25 *per cent* of students felt online courses were comparable to traditional courses, over 50 *per cent* thought they learned less in an online course than in a face-to-face course. Almost 70 *per cent* of students studying online did so only because the course was not available in a traditional mode.

Problems with using new technology may explain much of the early dissatisfaction with this mode of teaching; however, over time, the technical issues have reduced as technology has become more user-friendly and robust (Allan, 2007a) and yet traditional modes still hold sway with students. An explanation, complementary to that of Rider and Smith (1999), is offered by Akerlind and Trevitt (1999). They suggest that changing to an online learning environment involves students moving from teacher-dependency to being more self-directed through a paradigm shift in which students must re-orientate their assumptions and expectations about learning and teaching. They found that students were more likely to resist change when it conflicted with their past traditional educational experiences. It would seem that a preference for traditional teaching modes and a relative dislike of online learning may be two sides of the same coin. Students are comfortable when they can study the way they have always done and feel threatened when they are required to make fundamental changes to those approaches.

Finding 2: Blended learning offers a richer learning experience than either online or traditional modes of learning

It would be tempting to argue that the blended learning mode is a compromise position between the two extremes of traditional and online learning. However, we would argue that a blended learning environment, rather than being a compromise, in fact offers the student a wider range of affordances that enhance the learning experience beyond that of either online or face-to-face modes. Support for this interpretation is offered by Ramsden (2003), who argues that

blended environments increase student choice and this can lead to improved learning.

Oliver and Trigwell (2005) suggest that a blended environment may offer experiences that are not available in non-blended environments and that the nature of these different experiences could promote learning. Their reasoning is based on variation theory, which proposes that students can understand only when they are able to discern important differences or patterns in the object of study: "Discerning means that a feature of the world appears to the subject, and is seen or sensed by him or her against the background of his or her previous experiences of something more or less different" (Oliver & Trigwell, 2005, p. 22). It is only by experiencing dryness that we can understand what it is to be wet. A blended environment may offer a range of experiences related to the same subject matter and these may offer different perspectives that enable students to recognise patterns or variations, and consequently develop a more holistic understanding.

Further evidence for this argument is suggested by Ashcroft (1987), who found that learning was enhanced when students used multiple senses and experienced a wide range of learning activities. Coming from a slightly different perspective, Chickering and Ehrmann (1996) also argued the value of addressing diverse ways of learning. Should blended learning have the ability to improve learning because of the particular features of this mode of teaching, then a considered pedagogical approach is needed to design blended courses. Such an approach should consider:

1. Which learning components should be offered online and which in the classroom?
2. What are the characteristics of the learning components or experiences that facilitate learning?
3. Do these characteristics hold true for all students and subjects, or are there intervening variables?
4. What tools can be used or developed to analyse a learning task to determine which components offer the appropriate experiences?

Finding 3: Teachers are the gatekeepers to student experiences

In 1986 Shuell said, "It is helpful to remember that what the student does is actually more important in determining what is learned than what the teacher does" (Shuell, 1986, p. 429). We agree with this – mostly; but we would add 'what the teacher does first strongly influences what the students do'. Teachers are the gatekeepers to learning experiences.

Teachers through their selection and design of learning experiences will influence the nature and quality of student learning. What students learn is determined by what they have the opportunity to DO when they engage in the experiences and activities designed by teachers. Students' perceptions of the usefulness of such experiences to their learning are strongly influenced by their opportunity to use them.

Teachers told us that their main use of online sites was as a repository of resources, and this influenced how students perceived and used this feature. Students rated online presentation materials such as teaching notes and PowerPoint slides to be the single most useful learning component in their blended environment. This assertion was supported by the learning analytics; using online learning resources made up the largest part of all online activity. Students worked with what was made available to them.

Students whose courses had online quizzes rated these much higher than the overall rating for presentation materials. Most students did not have access to quizzes, and consequently the overall rating for quizzes was much lower. Courses with quizzes had significantly higher levels of online activity than other classes. These students had different learning opportunities to other students, as determined by their teachers. This suggests that students' perceptions of usefulness are strongly related to the exposure they have to the experience. The engagement trend for Course 9 (see Figure 1) shows very high levels of engagement in the first half of the semester for which there were numerous quizzes available. In the second half of the semester engagement levels drop dramatically. The teacher had not loaded any quizzes in the second half of the semester.

One final piece of evidence is presented to support this finding. The level of student engagement in structured learning activities, that is, those specifically designed by the teacher for learning purposes, was the strongest predictor of learning outcomes. What students do influences their learning outcomes; what they do is influenced by what teachers do first.

Finding 4: Teachers are more conservative and less enthusiastic than students about embracing opportunities offered by technology

Teachers expressed deep reservations about the role of technology and they had a strong belief that teachers should still be the central actor, with technology playing a minor support role. Heaton-Shrestha *et al.* (2009) also found teachers to be less enthusiastic than their students about the learning benefits of an online learning component. Becker and Jokivirta (2007) reported extremely low enthusiasm for online learning by academics both in Australia and worldwide.

Our teachers thought that lectures were useful for explaining theory, and that tutorials provided the opportunity for students to actively engage with the theory at an applied level. Online learning environments were seen primarily as a central repository for all course-related information and their main function was to provide ready access for students. As the first port of call, teachers would refer students to the online site to find information and resources for all aspects of the course from administration to assessment requirements to help with learning. Students were urged to check the online site before asking questions of teachers.

While teachers felt they benefited from not having to be the central source of information for students, some expressed concern that putting everything online

reduced the incentive for students to come to lectures, and certainly several teachers reported declining attendance, reaching as low as 25 *per cent* in some cases. Despite these concerns, teachers admitted to bowing to student pressure to make resources available online.

Teachers did acknowledge that online teaching had some benefits. As a repository the online environment did not suffer the time and space limitations of a classroom. The LMS was also regarded as an excellent mechanism for rapidly contacting all students: "the great thing about it is that you can put stuff in it that students can access from any time anywhere. I can broadcast out quickly out to students saying, 'Work change' or 'I've just found this' or 'Your results are now available'" (Jill). However, many teachers also qualified their praise. Several described themselves as "old fashioned", which was the inevitable introduction to a statement about their personal preference for classroom teaching.

Few teachers made use of their online learning sites beyond being a repository and having the ability to deliver messages to students. Those teachers who made limited use of online sites expressed concern about the role of an online component as part of a course. The literature suggests four possible reasons: conceptions of learning technologies, concern about their status being reduced, a lack of time to develop the site, and a lack of training and support.

The attitudes and behaviour of most of teachers in the study is perhaps explained by the work of Ellis, Hughes, Weyers and Riding (2009), who suggest that perceptions of learning technologies as being primarily access and information delivery devices are more about efficiency than integrating the technology into the learning experience to support student learning. This view is shared by others; for example, "Teachers often yield to the seductive appeal of a learning management system, where it is easy enough to populate a weekly schedule with readings and activities, rather than create a complex and engaging task as a vehicle for substantial learning in the course" (Herrington, 2006, p. 3). Conversely, when learning technologies are seen as ways of encouraging active learning and building knowledge, they tend to be related to approaches to design that aim to encourage student learning that can lead to an applied understanding.

Only one teacher in the study talked about the pedagogical benefits of a blended approach, recognising that it could foster multiple approaches to learning. This teacher was aware that lectures move at one pace, which may be too fast for some students who may be too shy to ask questions at the time. Additionally, some points may not be fully covered in class. The online environment allowed her to post additional teaching notes and write answers to student questions in a way that extended the teaching in the classroom. This teacher chose to develop the online environment for her class from scratch so that she could consider and incorporate components that were complementary to the classroom activities.

Finding 5: Teachers lack sufficient time, support and resources to create effective blended learning environments

Greener (2009) argues that teachers may feel threatened by the exposure of their teaching practice to comparisons with online videos and experts, and thus be reluctant to engage in activities that would enable such comparisons. We found no evidence of this concern in our teachers, but they did express frustration at the lack of time they had for developing the online learning sites. Competing academic pressure for research outputs reduced time for developing their online teaching sites. Teachers also felt frustrated they did not have time to learn to use the system properly nor to be able to personalise it to reflect their approach to teaching and learning:

I haven't got enough time to learn how to use it properly. I think I'm only using maybe 20 or 30 per cent of what its real potential is for me as a teacher. And I know I need to sit down and really learn the system but I haven't had time to do more than emergency learning, which is not ideal for anybody and leads to problems (Tom).

Time is widely acknowledged in the literature to be an issue for teachers in online courses (Becker & Jokivirta, 2007; Maguire, 2005). MacCallum's (2011) study of adoption of mobile learning found that teachers needed time to explore new technology, to practise using it and to work out how this technology could be used to bring about pedagogical benefits to their students before they were ready to introduce it to their classes. The need for time to explore and play with new technology before using it in teaching was also a major finding by Jeffrey *et al*. (2011). Not only is becoming familiar with the technology an issue, but the time designing and delivering an online course can also take its toll (Stodel *et al.*, 2006).

The importance of support and training to enable teachers to maximise online learning is well established in the literature (see for example, Becker & Jokivirta, 2007; Kim & Bonk, 2006; Mansvelt *et al.*, 2009). The teachers in this study were promised considerable assistance from support staff with setting up and developing their online learning sites. In the event, large-scale changes in the tertiary sector resulted in wide-spread redundancies, which all but wiped out this stratum of support staff in the organisations in the study. Teachers coped with such a lack of support by filling the site with easily obtainable resources such as YouTube videos, and most preferred to start with a copy of someone else's site and modify it to fit their own course. When these strategies are used as time savers, they are not always conducive to quality learning.

A lack of time for development and infrastructural support can be significant inhibitors to developing suitable online experiences (Becker & Jokivirta, 2007). Changing from traditional modes of teaching to blended modes involves substantial adjustment by the teacher. Not only must they come to terms with the new technology and ensure that the pedagogical needs of their students are served by the technology (MacCallum, 2011), they must fashion a different role for themselves in this new environment (Kim & Bonk, 2006). Becker and Jokivirta (2007) report that even such training as is available "has generally proved to be relatively ineffective, or that the majority of academic staff is not yet participating in such programmes" (p. 6). Just as students cling to the

traditional and familiar, it is not surprising that staff who are not given time and support to address these adjustments will resist change.

Student engagement in a blended learning environment

Student engagement is a deceptively complex construct that is not easily measured. It involves time, effort and activity, not all of which are visible. In addition, the same level of engagement may produce different outcomes for different students. We chose three types of measure to get a richer, more complete picture of this phenomenon: self-reported engagement, online engagement and dropout data.

Finding 6: In a blended environment students will engage in a blend of learning behaviours and activities that have personal efficacy and relevance for them

Students choose their own idiosyncratic mix of engagement activities for learning with some favouring a greater online blend and others more traditional components in their blend. It would appear that while a range of blends might be successful in promoting learning, not all blends are equally effective.

The self-reported measure of engagement provided students' perceptions of where they put their time and effort. We found that students engaged with learning in four major ways, through structured learning activities, non-structured learning resources, collaborating with other students, and discussing ideas with their teachers. Structured learning activities involved putting time and effort into studying textbooks, study guides and other teacher-provided materials, working on assignments or studying for tests and using library resources. Non-structured learning resources included using email or online forums, ideas from other courses, asking questions or contributing to discussions. Collaborative learning included all aspects of working with other students. Students also discussed with their teachers ideas, assignments and/or future careers.

Learning analytics from the LMSs produced a vast amount of data showing the frequency with which students viewed online learning resources, discussion forums and quizzes. Self-reported engagement activities tended to correlate most strongly with each other, as did online engagement activities. However, all of the self-reported and online engagement activities, except for collaborative learning, were related to learning outcomes.

It is possible from these results to see particular blends that students chose, and to determine the effectiveness of these blends from their relationship with course marks. For example, one blend is evident in students who frequently seek out their teachers for individual discussion. Teachers had commented that often the main reason for students coming to see them out of class was to ask for help understanding ideas, clarifying assessment requirements or explaining where they had gone wrong in assessment, suggesting a large group of these students were struggling. These students are also high on collaboration with other students and using non-structured learning resources. They engage to a moderate level in planning and use of online learning resources. They are low on

using online forums, suggesting that they are less likely to seek help from other students in an online forum. These students seem to prefer to ask for help from their teachers and other students face to face. This blend is negatively correlated with final marks. The ineffectiveness of this blend of activities is perhaps additionally explained by their lack of persistence. Students high on discussions with teachers were the only group of students who were low on persistence.

Students who report being high on collaboration share a similar profile to those high on discussions with teachers. Indeed, there is likely to be a reasonably large overlap between these two groups. The main differences with this blend is that high collaborators have a low but negative correlation with all online activities and a moderate association with persistence. There was no identified relationship between collaboration and marks. Perhaps their persistence is instrumental in preventing a negative correlation between collaboration and marks.

One other interesting relationship can be found between different types of engagement. The high correlation between online quizzes and using online learning resources strongly suggests that the presence of online activities promotes the use of other online learning resources.

Aspen and Helm (2004, p. 251) reached similar conclusions about the capacity of a blended environment to offer students the opportunity to "create their own pathways through the learning experience". This individualised learning also creates the opportunity for students to take greater responsibility and control of their learning, as they determine what their learning needs are, and which activities best meet those needs. Aspen and Helm argue that when "used appropriately, the effective blend of face-to-face and online learning opportunities provide enhanced opportunities for students to maintain their connections with their learning experience according to their particular needs" (p. 251).

Finding 7: High levels of engagement and persistence in structured and non-structured learning activities are associated with academic success

The most successful students were those who reported being deeply engaged in structured learning activities. These students were high on planning and persistence, and low on procrastination. They engaged in a wide range of learning activities and approaches, including talking to teachers, collaborating with other students, using non-structured learning resources and online forums.

The students who made high use of a range of non-structured learning resources shared a number of characteristics with students who strongly engaged in using structured learning activities, and again there is probably some overlap between the two groups. The main difference was that the relationship between students high on using non-structured learning resources and final marks was much more modest than for the structured learning group. This difference may be partially explained by the greater level of planning and persistence by the structured learning group.

Finding 8: Levels of engagement are strongly influenced by assessment and online activities such as quizzes

The levels of students' online engagement fluctuate during the semester, but generally follow a similar pattern, peaking strongly immediately prior to assessment dates, and then dropping sharply. However, this pattern is moderated when online quizzes or related activities are used. In courses high on quizzes, the level of engagement between peaks is higher and more sustained than for other courses.

Teachers reported a steady decline in attendance at lectures, though again these peaked immediately prior to an assessment. Some classes had dropped to 25 *per cent* attendance levels by the end of the semester. Given the high value students placed on lectures as a teaching mode this is perplexing. Some teachers felt that placing too much material online discouraged attendance; however, while this might account for part of the absence, some courses with very little online material had poor attendance and some courses with plentiful resources had much better attendance.

Strategies for student engagement

Finding 9: Using appropriate engagement strategies at the appropriate time increases student engagement

From a comprehensive review of the literature we developed a framework of 10 engagement strategies that matched strategy to particular course contexts (see Figure 1). We identified three major categories of student engagement strategies: getting student attention, maintaining engagement, and re-engaging those who drift away or fail to engage. Most of these strategies are applicable both online and in the classroom, though the application of the strategy may be different. We found that the application of appropriate strategies at the appropriate time and place had a positive impact on the students' levels of engagement.

As part of the project a comprehensive toolkit of these strategies has been developed and is available through Ako Aotearoa.

Substantial agreement between the use of online engagement strategies and the level of engagement by students in online activities was found. Courses that incorporated engagement strategies in their online environment experienced much higher levels of student activity online. It was found to be impractical to take a quantitative measure of classroom engagement strategies, so we used online engagement strategies as a proxy on the basis that good design online was likely to be replicated in the classroom. We tested whether the use of good online engagement strategies were related to students' self-reported levels of engagement. We found there was such a relationship, but as expected the effect was not as strong. Overall, these results offer clear evidence of the efficacy of using specific types of engagement strategies at appropriate stages in the teaching process.

Although we did not use a quantitative measure to assess engagement strategies in the classroom, we did ask teachers to describe the strategies they used. In

general, teachers described using more fully developed strategies in the classroom than we found on their online learning sites. This probably reflects the greater familiarity with and time spent in classroom teaching. We also found that teachers who described effective classroom engagement strategies were more likely to make better use of online strategies.

Courses that used engagement strategies showed higher levels of engagement than classes in which they were absent or used minimally. This provides support for our argument that teachers should actively plan to use engagement strategies and these should be used systematically to cover all three phases of need: stimulating engagement, maintaining engagement, and recapturing the disengaged. These phases are related to Fitzgibbons and Prior's (2003) zones but narrow the scope specifically to the responsibility of the teacher.

Finding 10: The greatest potential for improving student engagement comes from using primers

Most teachers did not use online primers to stimulate interest, though most used some kind of priming strategy in the classroom. With one exception teachers did not rate this strategy as very important and did not seem to invest a great deal of time thinking about stimulating curiosity or demonstrating relevance. As one teacher said, "I don't know if I'd necessarily go out of my way to make them interested" (Helen). Using online primers had a greater effect on subsequent engagement than any other engagement strategy.

The literature supporting the importance of stimulating curiosity and demonstrating personal relevance to learning is extensive (see for example, Doo & Kim, 2000; Keller, 2010; Levy, 2007; Shea *et al.*, 2003). Importantly, these strategies are used at the very early stages of the course, a time when students are most vulnerable to dropping out or failing to engage. Curiosity is strongest in experts, who can identify gaps in their knowledge and have the skills to pursue the information to fill those gaps (Loewenstein, 1994). The converse of this is that students have much lower levels of curiosity, hence the need for teachers to prime the pump to start in students a hunger for knowledge. Kashdan, Rose and Fincham (2004) found curiosity to be related to persistence and enjoyment, and to learning (Reio Jr. & Wiswell, 2000).

Relevance – the recognition that something has the ability to satisfy needs and wants, and achieve personal goals – has also been widely associated with learning outcomes. When students fail to find a fit between learning content and their own aspirations, they are unlikely to pay attention to it (Murray & Sandars, 2009). In addition, a lack of personal relevance has been found to be related to higher student dropout rates (Levy, 2007; Park & Choi, 2009). Consequently, demonstrating relevance at the first opportunity is critical to the learning process.

While relevance is thought to work through motivation, there is extensive evidence that it also raises the level of cognitive interaction with the learning material (Biggs, 1987; Entwistle & Peterson, 2004; Lepper, 1988; Ramsden, 2003). Ozkal, Tekkaya, Cakiroglu and Sungur (2009) found that students who

found personal relevance in course content were likely to hold more sophisticated epistemological beliefs about the nature of knowledge and to see it as changing and evolving.

Finding 11: Potential dropouts can be retrieved while they are in the 'zone of discontent'

Only two teachers actively monitored engagement and then applied strategies to recapture disengaged students. Both teachers relied on the non-submission of the first assignment to identify disengaged students whom they then contacted. Most students responded quite quickly and caught up with their work. Those who had failed to respond were contacted again and a few more were re-captured. Problems were discussed with the teachers and accommodation made where appropriate. These two courses had the lowest dropout rate. The results suggest there is a period during which students experience discontent with their studies, but most of these students can be retrieved if contacted before making the final decision to withdraw. The key is early identification, personal contact and negotiation for a workable solution for the student (Fitzgibbon & Prior, 2003; Trotter & Roberts, 2006).

There are a number of indicators that students are in the zone. These students will procrastinate more, attend class less (including visiting online learning sites), and have poorer study skills (Fitzgibbon & Prior, 2003; Johnson, 1994). Taking rolls in class was not a popular idea with most of the teachers in our study. They felt it was up to the student to take responsibility for attendance. The literature, however, advocates the importance of taking attendance, both to assure attendance and for early identification of potential dropouts (Trotter & Roberts, 2006). In an online environment the task is simpler as most LMSs provide teachers with instant reports on student online activity and easy facilities to individually email students.

Monitoring procrastination can be difficult because it is usually not evident until after a due date for submission of a piece of work, which may be as much as a third of the way through the course. Tuckman (1999, 2007) recommends smaller, regular tasks to develop better self-regulation and planning by students. A small assignment early in the semester would at least provide a kick start, and may induce less procrastination because it would not be overwhelming.

Finding 12: Most teachers had well organised courses with good structures

Seven of the nine online learning sites were well organised and structured. These were divided into appropriate chunks, easy to navigate, followed a logical structure, and had clear guidelines and instructions.

Students prefer well-organised courses (Hunt *et al*., 2004; Light, 2001) and dislike ambiguity (Marsden & Turnbull, 2006). Evidence suggests that that carefully structured courses increase student confidence and competence (Thompson & MacDonald, 2005) and are an important determinant of a student's tendency to follow a deep or surface learning approach (Rust, 2002). Such structure and support are even more important in an online environment,

where the normal social and contextual cues of the classroom are missing (Garrison & Arbaugh, 2007).

Finding 13: Social presence is largely underdeveloped in most online environments

Most teachers had contact details, a welcome message and a discussion forum online. However, these tended to be informational and it was hard to get a sense of the teacher from them. Wang and Newlin (2002) argue the importance of the social presence of teachers, particularly for those students at risk of dropping out. Social presence is felt as a sense of immediacy and intimacy in the way teachers communicate with their students. One of our teachers emphasised the care she took when talking or emailing students, using their first name and encouraging them to use hers.

Forums were almost wholly messages sent by teachers to students. These were rated highly by students (see Table 7) and by teachers who valued the opportunity to have ready contact with students, a finding that agrees with Aspen and Helm (2004). However, these messages were sent on an 'as needed' basis. Ryle and Cumming (2007) suggest that they are most effective when communication is frequent and regular.

Students made little use of the forums to connect with other students, a finding that supports those of Heaton-Shrestha (2009), who concluded that other avenues, such as the classroom and other online avenues (for example, mobiles and facebook), in a blended environment were more attractive. Social presence, when there is strong group cohesion, can contribute to higher levels of learning (Dixon *et al*., 2006; Swan & Shih, 2005). To achieve cohesion, the group must share a common intellectual purpose (Garrison & Arbaugh, 2007; Thompson & MacDonald, 2005). Under these conditions, social presence can be effective in both creating a comfortable learning environment and stimulating cognitive engagement (Akyol *et al*., 2009; Garrison & Anderson, 2003).

Influences on disengaging

Student disengagement takes a number of different forms. Formal withdrawal from a course signals total disengagement, but students may disengage in less obvious ways, such as failing to attend classes or complete assessment requirements. Students may also take part in these activities but at a very superficial level. Teachers report a variety of types of disengagement and students identified their most compelling reasons for considering full withdrawal.

Finding 14: Levels of disengagement in the classroom are of concern to teachers

Most teachers expressed concern at the poor levels of class attendance. Teachers attributed this to the fulsome provision of online materials, which they believed convinced students that they didn't need to attend class. Although a number of teachers would have preferred to reduce the online material, they felt pressured by student demand to supply it. Teachers in a study by Heaton-Shrestha (2009) made very similar comments. They expressed concerns that the provision of

PowerPoint outlines influenced student decisions not to attend class. In agreement with the teachers in this study, they argued that students believed that such materials created boundaries for the students about what content was important, and they subsequently failed to explore ideas or material outside of these narrow boundaries.

The literature stresses the importance of class attendance for academic success (Gracia & Jenkins, 2002). Although tertiary teachers may feel resistant to monitoring attendance, evidence strongly supports its efficacy (Trotter & Roberts, 2006). Following up absences need not be time-consuming or arduous; Fitzgibbon and Prior (2003) found that a gentle reminder for attendance was often enough.

Finding 15: About one third of students either dropped out or seriously considered dropping out

By the end of the semester, 15 *per cent* of students had dropped out, and a further 15 *per cent* of students had actively considered doing so. Such high rates of withdrawal indicate a significant level of dissatisfaction with the learning experience. Thomas (2012) found that some teachers had significantly better retention rates than would be expected based on entry grades. Retention rates could be improved by about 10 *per cent* with the use of engagement strategies.

Teaching quality was most frequently identified as the most main reason. These students described their teachers as 'boring' and 'not very good'. Reading PowerPoint slides was viewed very negatively, and as one student commented, "I'm quite capable of reading them myself". Teachers who were non-supportive and couldn't or wouldn't provide the help needed made students consider withdrawing. A small number of complaints were made about teachers who were rude, offensive or intolerant of students' personal beliefs. Several studies have highlighted the importance of the relationship between teachers and students. For example, Park and Choi (2009) found that the quality of student–teacher inaction and contact were decisive factors in a student's decision to withdraw, a view also reached by Astleitner (2000) in the context of dropouts in an online distance course.

A major study by Martinez and Munday (1998) found that dissatisfaction with teaching quality was a significant cause of student withdrawals. Similarly, large-scale studies in New Zealand found teaching quality to be the most significant reason given by students who had either dropped out or seriously considered dropping out of study (Hunt *et al*., 2002; Jeffrey *et al*., 2006). Other studies make the point in a more general sense by identifying course satisfaction and personal relevance as being important influences on dropout decisions (Levy, 2007; Park & Choi, 2009).

Course difficulty and the related issue of workload were the second most common reasons given for making students consider withdrawing. Workload has been a concern for students ever since internal assessment was introduced. The main source of concern for students in the past had been the uneven distribution of the workload (Hunt *et al*., 2002; Jeffrey *et al*., 2006). Assignments

tend to be due about the same time and because lecturers tended to place them shortly after the topics had been covered in class, there was rarely much opportunity for students to stagger assignment work in advance of due dates.

In this study, however, we observed a slight shift in the nature of student concerns. Heavy workloads that consumed too much time and effort, and high difficulty levels have become more significant stressors than workload distribution. Other studies have reached the same conclusion (Park & Choi, 2009; Thompson, 1997; Willging & Johnson, 2004). These concerns make an interesting counterpoint to comments made by students in the focus group who agreed that heavy workloads were an issue but, when the tasks were challenging and interesting, they were willing to work very hard and it did not seem to take so much effort. A similar point was made by one of our teachers, who described students willing to 'pull all-nighters' when working on a challenging, authentic, group-based assessment task. He quoted students as saying they had never worked so hard on an assignment but had not enjoyed one so much.

However, other factors may also play a role. Many students juggling student loans, part-time or even full-time work and family commitments are unable to spend as much time on their studies as teaching staff expect and this will increase the feeling of pressure (Hoyt & Lundell, 2003). Kuh (2003) found that university students spent only about 12 hours per week studying outside class time, roughly half the recommended time.

Finding 16: High dropout rates are associated with higher course grades

This is a tentative finding as only nine courses were involved. The relationship however was striking (see Figure 2). The numbers of students dropping out of a course in the study differed between classes, ranging from one to 18 *per cent*. It appeared that courses with higher marks had higher dropout rates. One possible explanation is that students who drop out are struggling with course work or load, raising the overall mean marks of the remaining students. A number of teachers made observations to this effect. These teachers were unperturbed by this trend as they felt it left them with students who were keen and committed. However, there is another way of viewing these results.

Teachers who work hard to retain more of the struggling students may consequently have lower means. They have to work harder for this result, but in terms of efficiency, these teachers make a greater contribution as every dropout has a social and economic cost. Education for these teachers is more about developing human capital than selecting it. If this relationship can be established in further research, then dropout levels may be a better measure of teaching quality than student marks or grades.

Conclusions

Blended learning has its roots in both classroom teaching and online learning so it is not surprising that engagement strategies that work in these two environments are also going to be important in a blended course. What distinguishes the blended course is the careful planning needed to blend the two modes to maximise learning for students. The 10 strategies identified can be readily recognised and accommodated in the classroom, though the notions of 'social presence' and 'belonging' perhaps give a new impetus to teachers to consider classroom climate. The online environment requires much greater effort by teachers to structure the learning elements in pedagogically sound ways. For example, the ability of the online environment to hold very large amounts of information can encourage teachers to populate the site with large quantities of unstructured resources. The principles that underpin the engagements strategies remain the same, but the application is very different and requires much more effort by teachers. Only by using the 10 engagement strategies both online and in the classroom can the synergetic effects of a blended approach be realised.

1. The quality of learning depends on the depth of student engagement in the learning process

Students' learning depends on the level and quality of their interaction with learning experiences. Students who reported being deeply engaged in structured learning activities, using a wide range of learning resources and approaches, including non-structured learning resources, talking to teachers, collaborating with other students, and online forums, achieved the highest learning outcomes. These students were also highly organised in their study and persistent with difficult problems. What students DO matters.

2. The systematic application of all 10 engagement strategies identified in this study to both online and classroom learning gave teachers the best chance of achieving high levels of student engagement

Engagement is enhanced when the following engagement strategies are used: primers, social presence, challenging and authentic tasks, timely and elaborated feedback, clear course structures, unambiguous instructions and guidelines, monitoring and early identification of students in the 'zone of discontent', and personal contact to negotiate the conditions of re-engagement. These strategies are needed both online and in the classroom, though the application may differ. Applying these strategies online is more difficult for most teachers because of their greater familiarity with classroom teaching.

These strategies are not interchangeable. Each strategy represents a critical aspect of the learning process and all are required to achieve the maximum benefit.

3. The skill and effort that teachers use to create learning experiences is the single most important determinant of the quality of the learning environment

This skill was most evident in how well teachers used the 10 engagement strategies. The quality of the learning experience is rooted in the application of the 10 engagement strategies. Teachers who use these strategies when integrating an online component with classroom teaching are able to create a greater variety of learning experiences for their students. These experiences offer students greater flexibility in structuring their own learning and multiple perspectives of the learning content. The most successful students used a blend of online and classroom elements. Unless teachers consciously entice, stimulate, curate, structure, communicate and attend to student needs, then all that remains is a volume of undifferentiated resources that students must interrogate alone. Students are not trained, nor do they have the time to do this. It would be more honest to give them a library card and tell them to go and find out what they need.

Teachers who developed high-quality engagement strategies made measurable differences to the level of engagement by their students. This was most evident when teachers applied the engagement strategies online as well as in the classroom. Students in these classes worked harder and longer. Even good students will struggle in poorly developed learning environments.

Teachers who lacked these skills or effort created much less satisfactory learning experiences and increased the incidence of withdrawal. Withdrawals represent lost income and wasted resources. The key to improving retention is to improve the quality of the learning experience, and enthusiastic, competent teachers are one of the main means of achieving this aim.

4. Teachers are time-poor and lack adequate technical support and training in pedagogical principles

Teachers were unclear about the pedagogical benefits of a blended environment. Most saw it as a repository for resources and an opportunity to ease the burden of student questions. Teachers were harried to have their online sites ready for the semester and had little time for exploration or reflection on the opportunities presented by the digital environment. They had had minimal training and very little technical support. Not surprisingly these teachers were much less enthusiastic about merging traditional and digital modes of teaching than students.

5. Blended learning can make a difference

We conclude that blended learning has the ability to make a major impact on tertiary teaching in a positive way. Learning management systems are capable of helping to identify students who are at risk of disengaging. With substantial staff development and improved digital teaching strategies, levels of student disengagement can be minimised. This is an important finding because, in a

constrained financial environment, each student who disengages is a substantial loss not only to the institution but also to the nation as a whole.

Recommendations

We make seven main recommendations.

National Recommendations

1. Much learning and development in the practice of good teaching in a blended environment can be achieved through the creation of a national community of learning for tertiary teachers. Ako Aotearoa already takes a leadership role in this through the Ako Aotearoa project teams and communities of practice, including the Tertiary Teaching Award winners group. Additional contributions could be made by:
    a. hosting the online wiki for tertiary teachers to share teaching and learning strategies, examples and tools for blended learning
    b. funding further research to measure the effect of engagement strategies both in the classroom and online on student engagement and learning to substantiate the findings of this report.

Institutional Recommendations

2. Retention has clear economic and reputational implications. In addition to the broader obligations to develop a sense of belonging and social integration, institutions must take leadership in changing a teaching culture in which up to 30 *per cent* of students withdraw or consider withdrawing. A major strategy should be to improve teacher performance and accountability. This could include:
    a. developing objective procedures and practices for evaluating teaching practice. Reviews of teacher performance should consider retention rates and success in creating engaging courses that result in higher levels of learning
    b. collecting data at the institutional level to identify areas having particular retention problems.

3. Blended learning, when it is the "*thoughtful integration* of classroom face-to-face learning experiences with online learning experiences" (Garrison & Kanuka, 2004, p. 96), can have a powerful effect on student engagement, and through this, retention and student satisfaction. Improving teacher capacity to develop these more sophisticated courses is urgently needed. Teachers need time, resources and support to develop both their skills and their courses. These may include, for example:
    a. workshops to give teachers the opportunity to explore learning technology and/or to develop blended courses, supported by technical staff to minimise frustration and maximise learning
    b. the opportunity to view sample courses that integrate the 10 engagement strategies
    c. providing course templates that teachers can populate with their own materials
    d. time release for teachers to develop their blended learning courses.

Teacher Recommendations

4. Teachers should redesign their courses for blended learning, not just add an online component to their regular teaching. The best courses we saw had been thoughtfully considered and the online and classroom components coherently integrated. These courses had been designed starting with a blank slate.
5. Teachers should be strongly encouraged to systematically incorporate all 10 engagements strategies, not mix and match them, into each course for maximum effect on student engagement and retention.
6. Teachers should monitor student engagement online (learning analytics) and in the classroom (taking rolls) for early identification of disengagement. This is essential to improving retention.
7. Blended learning environments should make wide provision to allow students to select their own preferred blend of learning components to foster diverse ways of learning. This carries the proviso that students are given guidance in selecting useful blends.

Toolkit

As part of this project, the research team developed a toolkit of examples, strategies and tools to be used for the design of blended learning courses. These are presented in a framework that allows the user to work systematically through the design process, or to select from anywhere in the framework items that fulfil a particular need.

The design process follows five steps: needs analysis; design of layout and format; development of content; evaluation of the course; and reflection. Central to these stages are engagement strategies. Embedded in the five stages, an extensive list of tools, strategies and examples are provided to specifically address the 10 engagement strategies identified in the report. For example, a number of techniques are suggested for stimulating student curiosity.

It is envisaged that teachers would find these tools and strategies useful for the design and development of their own blended courses by suggesting useful approaches and ideas. These tools and strategies are described in more detail below.

The toolkit is available through the Ako Aotearoa website. The website is in the form of a wiki to encourage teachers to add their own tools and examples for other teachers.

Needs analysis

This part of the toolkit is to assist with identifying and collecting information that will inform the teachers' design decisions. For example, the decision to determine which elements of a course should be online and which in the classroom is supported by a tool that provides an overview of the advantages and disadvantages of each element in an online or classroom context. There is no one answer that is always right. Teachers should weigh up the pros and cons in relation to what they know of their students.

Design
The tools provided here are concerned particularly with the design, appearance and functioning of the online environment, and they suggest best practice for the layout and format used online; for example, the online design checklist provides advice and recommendations on the content, layout and format for each element of an online learning site.

Content development
This section is concerned with developing the course content, communication functions, administrative content, and support and contact information for students. An example of a tool from this section is the content structure tool, which suggests a variety of alternative ways of organising learning content.

Course evaluation
Before the course goes live it is useful for the teacher to check the coherence and completeness of their course design. A simple tool provided identifies agreement between objectives, learning materials and experiences, and assessment.

Reflection
After the course is finished and student feedback is received, teachers can use the simple reflective technique provided to harness additional insight to the effectiveness of their course and ideas for further development.

Additional resources

Below is a list of useful resources that provide further additional suggestions and examples for developing blended courses.

Website:
What does a high-quality online course look like? Tips for online learning and exemplary courses can be found at www.csuchico.edu/celt/roi

Books:

Allan, B. (2007). Blended learning: Tools for teaching and training. London: Facet.

Arbaugh, J., Godfrey, M., Johnson, M., Pollack, B., Niendorf, B., & Wresch, W. (2009). Research in online and blended learning in the business disciplines: Key findings and possible future directions. *The Internet and Higher Education*, *12*(2), 71-87.

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Limitations

The major limitation of this study was the lack of representation we achieved when both a major South Island tertiary institution and a wānanga were not able to take part in the data collection because of two separate, major traumatic events (described below).

The study involved nine business courses and so needs to be repeated with more classes in different discipline areas.

While the sample size was reasonable, a larger study would give greater confidence to the results.

Further research to measure the effect of engagement strategies both in the classroom and online on student engagement and learning would give greater clarity and confidence to our findings. Most of the courses surveyed relied strongly on a transmission model of learning in which the focus was on disseminating information rather than an approach in which students learn from multiple ways of interacting with others and learning experiences.

This study was adversely affected by seismic shifts of both a geographical and organisational nature. Restructuring of the tertiary sector dramatically reduced our research team and the technical support we had counted on to carry out the study. The same events caused changes to the teaching programme and staff at short notice, affecting our sample and our ability to fully implement our intended interventions. The 2010–11 Canterbury earthquakes removed a significant component of our team and sample. Tragically, one of our team members was killed in an accident and the work he had done was lost to the project. If these events had occurred all at once, perhaps we could have adjusted, but these events occurred at regular intervals throughout the life of the project. No sooner had we re-grouped from one episode and planned a way forward than another blow came from a different direction.

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Appendix A: Principal component analysis

Student learning behaviour and student engagement strategies were measured by questionnaire items. Principal components analysis (PCA) was then used to verify that the intended scales were measured by the survey items. PCA had the effect of reducing a large number of items to uncorrelated factors that could be used in further analysis. Reliability analysis was used to confirm this process.

Each analysis was carried out in four steps. First, the data was evaluated for its appropriateness for factor analysis. A correlational matrix with correlations greater than 0.3 between items indicated the likelihood of underlying processes. The size of the sample needed for the number of variables has been the subject of debate; however, the ratio of sample size to items for both each scale (learning behaviour 1:39; experiences 1:24) meets the more stringent guidelines (Tabachnick & Fidell, 1989). The Kaiser-Meyer-Oklin (KMO) of 0.793 (study behaviour) and 0.827 (student engagement) as measures of sampling adequacy is described by Kaiser (1974) as "very good". The KMO together with Barlett's test of sphericity (1220.048; $p<0.0000$: study behaviour) and (1970.745; $p<0.0000$: student engagement) established the appropriateness of the data for the analysis.

In the second step, components were extracted. To avoid over-specification, component loadings were set at 0.40. Variables that cross-loaded were assumed to load on the component for which they had the highest loading. To minimise errors in interpretation, components were described by considering loadings in descending order. The three-factor solution (study behaviour) extracted 45.9% of the variance and the five-factor solution (student engagement) 58.59%. Information on the components is set out in Tables A1 and A2.

In the third step, orthogonal rotation with varimax was chosen for simplicity of reporting and because it was intended to use component scores for further analysis (Tabachnick & Fidell, 1989).

Finally, component scores were computed for each case using the regression method.

Student learning behaviour

Students were asked to how well a range of study behaviours described them. Three components emerged accounting for 45% of the variance (see Table A1). Two items were dropped as they cross-loaded on more than one component. Reliability was also improved by dropping a further item.

Table A1: PCA results for study behaviour scale

	1	2	3
Component 1: Procrastination			
I often find myself working late the night before a test or assignment is due	0.74	0.04	0.03
I am often behind with my assignments	0.73	0.01	-0.22
I usually leave assignments or study for tests until the last minute	0.66	-0.27	-0.28
I find it hard to get started on assignments	0.59	-0.13	-0.04
I complete assignments comfortably before the due	-0.56	0.34	0.06

date			
Component 2: Planning			
I plan a study timetable well in advance of tests or exams	-0.12	0.83	-0.01
I set aside regular times for study and stick to them	-0.10	0.78	0.08
I set specific study goals when preparing for a test or exam	-0.13	0.69	0.25
Component 3: Persistence			
When I have a problem understanding a learning activity or exercise I spend extra time trying to work out what to do	-0.08	0.08	0.69
I put a lot of effort into my assignments	-0.11	0.12	0.65
I try hard to get all the information I can on how the course will be assessed	-0.10	0.08	0.60
When I have a difficult assignment I tend to work harder	-0.08	0.17	0.51
Eigenvalues	3.6	1.8	1.3
% of variance	24.2	12.0	9.2
Reliability coefficient	0.74	0.73	0.70
Mean	3.1	3.2	3.8
Std Dev	0.72	0.77	0.46

Student engagement

The second scale measured self-reported student engagement.

Table A2: PCA results for engagement scale

	1	2	3	4
Component 1: Engagement in learning activities				
Read the textbook, or other material from the teacher (*e.g.* study guides or hand outs)	0.75	0.06	-0.02	0.07
Prepared for class (*e.g.* reading, exercises *etc*.) beforehand	0.67	0.17	0.03	0.04
Spent more than 30 minutes on practice exercises, questions, or activities	0.62	0.11	0.08	-0.12
Worked harder than you thought you could to meet a teacher's/tutor's standards or expectations	0.59	0.28	0.09	0.20
Spent more than 30 minutes studying for a test or exam or working on an assignment	0.58	-0.20	0.06	0.32
Prepared two or more drafts of an assignment before handing it in	0.56	0.25	0.10	0.00
Used library resources online or on campus	0.49	-0.03	0.17	0.27
Component 2: Discussion with teachers				
Discussed ideas from your readings or classes with teaching staff outside class time	0.13	0.84	0.15	0.10
Talked about your career plans with teaching staff or advisors	0.15	0.79	0.13	0.04
Discussed your marks or assignments with teaching staff on this course	0.16	0.77	0.22	0.03
Component 3: Collaborative learning				
Worked with other students outside class to prepare assignments	0.05	0.11	0.84	0.04
Worked with other students on projects during class	-0.04	0.01	0.78	0.18
Met with a study group	0.10	0.21	0.73	0.00

Discussed ideas from your readings or classes with people from outside of your class (*e.g*. family or students from another class)	0.21	0.19	0.54	0.03
Component 4: Used a range of learning resources				
Used an online learning system (*i.e*. Stream, Moodle or Blackboard) to discuss or complete an assignment	-0.01	-0.04	0.06	0.80
Used email or a forum to communicate with the courses teaching staff	0.04	0.48	0.04	0.56
Used ideas or concepts from other courses to help with this one	0.33	0.14	0.09	0.54
Asked questions or contributed to discussions in class or online	0.14	0.28	0.27	0.32
Eigenvalues	4.69	2.03	1.54	1.26
% of variance	16.0	14.4	13.2	9.2
Reliability coefficient	0.75	0.82	0.76	0.52
Mean	3.1	1.9	2.9	3.1
Std Dev	0.71	1.1	1.0	0.78

Table A3: Longitudinal comparison of preferences for teaching modes

	$\bar{x}$ (Std Dev)		
Modes	2002 Hunt (n= 1212)	2006 Jeffrey *et al.* (n= 1811)	2011 This study (n= 435)
Printed study materials such as study guides, textbooks	3.87 (0.98)	3.94 (0.92)	3.95 (0.88)
Lectures	3.64 (1.0)	3.61 (0.90)	3.88 (0.80)
Tutorials	3.75 (1.0)	3.71 (0.89)	3.80 (0.81)
Mixture of online and lecture (face-to-face) courses	Not measured	3.48 (0.93)	3.75 (0.90)
Group projects	2.66 (1.2)	3.04 (1.0)	3.24 (1.00)
Online discussions, chatrooms developed by teachers	2.24 (1.2)	3.23 (1.0)	3.16 (1.04)
Student presentations	2.50 (1.1)	2.92 (1.0)	2.96 (1.00)
Fully online courses	2.82 (0.96)	3.05 (1.1)	2.94 (1.11)

Appendix B: Report on pilot studies

Student engagement in blended learning business courses

The aim of this project is to investigate student perceptions of the blended environment, embed the findings in a framework, and provide guidance to teachers to help them enhance learner engagement and achievement within a blended context. This report outlines the pilot stage of the project that aimed to investigate the toolkit, survey instruments and techniques that will be used in the main trial. There were three pilots in the project. The report focuses on the data collected in the first pilot, which was an international business course. The outcomes of the other pilots are summarised below.

The second pilot tested if it was possible to identify the students who do not use the Blackboard learning management system and then test the processes to re-engage these students. Blackboard displays what students did in the system and can identify those who make no or little use of it. The plan was to identify these students early in the course and then write to them to offer support. This did not occur because all students were active in Blackboard at this time. The pilot did verify that Blackboard does generate the data to identify students who do not use or used the system infrequently early in the course.

The third pilot tested an engagement questionnaire that was in the form of an online pre-test and a post-test. The pre-test was in two sections that were delivered two weeks apart. Eleven students from a class of 30 completed the first section of the pre-test and three students completed the second section. This gave a total of three completed pre-test questionnaires. The post-test was not attempted because of the low return rate. It was decided not to divide the questionnaire into sections and to change the delivery mode.

The rest of this report is about the first pilot. This tested the use of the toolkit and the instruments that we plan to use for the main trial.

Student engagement in an international business course

The international business course was campus-based with face-to-face lectures supported with a learning management system (LMS). There were three hours of contact time: two lectures and a tutorial. The lecturer advised students to participate in class and the LMS, read the course material, do the internal assignments and sit the final exam. There were twelve topics taught over the 15-week semester.

The lecturer was concerned about student engagement on the course. The completion rate was lower than average and student motivation appeared low at the start of the course as students did not appear to be attending the lectures. A teaching consultant and the lecturer discussed a number of options to improve engagement and decided email those who were not using the LMS, set up a discussion forum, and have online quizzes each week.

Methods

This mixed methods study collected data from a number of sources. The LMS recorded the student usage. This data was compared to final course marks. The students were asked to complete a questionnaire on their teaching and learning experiences including: preference for teaching mode, experience of support, experience of paper, obstacles to learning and biographical information. This was delivered near the end of the course but before the final exam. The researchers sought to interview students who withdrew from the course. A total of 81 questionnaires were returned from a class of 147 who completed the course. The return rate was 55 *per cent*.

Characteristics of the participants who completed the engagement questionnaire
The respondents were equally divided into domestic and international students with a near equal gender mix (Table B1). The mean age was 24 (Std dev 4 years).

Table B1: Gender of domestic and international students

	Domestic	International
Male	32	33
Female	33	34
No answer	16	14
Total	81	81

Table B2: Ethnic groups

Ethnic group		Country where attended most of schooling	
Asian	48	China / Korea / Japan	33
Pakeha	12	New Zealand	16
Māori	1		
Pacific Nation	2		
Middle Eastern	2	Saudi Arabia	1
African	2	South Africa / Zimbabwe	2
Indian	1	India	7
		UK	1
No answer	13	No answer	21
Total	81	Total	81

The respondents were a diverse group. The ethnic groups people most commonly identified with were Asian and then Pakeha (Table B2). There were also people identifying as Māori, Pacific Nation, Middle Eastern and African. The country where respondents attended most of their schooling was closely related to the geographical locations of ethnic groups.

Results

Students rated various teaching modes based on how much they liked them from 1 (strongly dislike) to 5 (strongly like) (Table B3). These results are similar to those of Jeffrey, Atkins, Laurs and Mann (2004) who reported that students preferred traditional teaching modes with lower scores for student teaching modes (items 6-8, Table B3). A difference identified in the current study was that students had relatively high scores for blended learning (item 2, Table B3).

Table B3: Students' preferences for various teaching modes

	Teaching Mode	Mean	Std dev	N
1	Printed study materials such as study guides, textbooks	3.93	1.00	80
2	Mixture of online and lectures	3.81	0.91	80
3	Tutorials	3.73	0.96	80
4	Lectures	3.72	1.00	80
5	Fully online courses	3.44	1.13	79
6	Online discussions, chatrooms developed by teachers	3.42	1.12	78
7	Group projects	2.95	1.22	75
8	Student presentations	2.93	1.36	74

Students rated the experience of support on a scale of 1 (not helpful at all) to 5 (very helpful) (see Table B4). Students rated lecturers as most helpful, followed by support staff and then other students. More than 90 *per cent* of students rated teaching and support staff as moderately helpful or better.

Table B4: Student experience of support

	Experience of Support	Mean	Std dev	N
1	Teaching staff	3.88	0.83	76
3	Student learning services	3.56	0.89	68
4	Administrative staff and services (secretaries, course advisors *etc*)	3.45	0.88	69
2	Other students	3.25	0.89	75

Engagement questionnaire

Students completed a questionnaire with three dimensions: academic challenge (five questions), active learning (nine questions) and student and staff interactions (four questions) (Table 5). The questionnaire asked students to respond to the questions on a frequency scale that ranged from never (0), to very often (5). For the academic challenge questions student responses clustered around the 'sometimes' response except for the assessment question where student responses indicated more activity. The responses to the active learning questions had more variation but generally responses indicated a low level of activity. This was particularly the case with questions about working with other students (q7, q8, q9, q14). The library resources received the highest usage score (q11). There was also high usage reported for online material (q6, q13). The scores for student and staff interactions indicate infrequent communication with the teachers except via email or online forums.

Table B5: Students' engagement with the paper

	Student engagement question	Mean	Std dev	N
Academic challenge				
1	Worked harder than you thought you could to meet a teacher's/tutor's standards or expectations	3.09	0.99	77
2	Read the textbook, or other material from the teacher (*e.g.* study guides or handouts)	3.53	0.99	78
3	Prepared for class (*e.g.* reading, exercises *etc*) beforehand	3.01	1.14	76
4	Spent more than 30 minutes on practice exercises, questions or activities	3.26	1.19	77
5	Spent more than 30 minutes studying for a test/exam or working on an assignment	4.33	0.80	78
Active learning				
6	Asked questions or contributed to discussions in class or online	3.08	1.11	78

7	Worked with other students on projects during class	2.56	1.36	78
8	Worked with other students outside class to prepare assignments	2.29	1.60	78
9	Discussed ideas from your readings or classes with people from outside of your class (*e.g.* family or students from another class)	2.65	1.32	78
10	Prepared two or more drafts of an assignment before handing it in	2.74	1.38	78
11	Used library resources online or on campus	4.18	1.07	78
12	Used ideas or concepts from other courses to help with this one	3.58	0.86	78
13	Used an online learning system (*i.e.* Stream, Moodle or Blackboard) to discuss or complete an assignment	3.68	1.17	78
14	Met with a study group	2.18	1.53	78
Student and staff interactions				
15	Discussed your marks or assignments with teaching staff on this course	2.41	1.48	78
16	Talked about your career plans with teaching staff or advisors	1.76	1.53	78
17	Discussed ideas from your readings or classes with teaching staff outside class time	1.99	1.45	78
18	Used email or a forum to communicate with the courses teaching staff	3.01	1.33	78

The overall Cronbach alpha scores are moderately high, which indicate good consistency among the questions for each dimension (Table B6). The questions for academic challenge and staff interactions all made positive contributions to the reliability and so will be retained.

There are two questions in the active learning section that detract from reliability so these questions will be removed from the questionnaire. de Vaus (2004, p. 184) suggests anything less than 0.30 is a weak correlation for item-analysis purposes. These are question 6 and question 13, which are questions about online learning.

Table B6: Reliability statistics for the three variables

	Variable	Mean	SD	Cronbach's Alpha
	Academic challenge (5 questions)	3.45	1.13	0.689
	Active learning (9 questions)	2.99	1.43	0.783
	Student and staff interactions (4 questions)	2.29	1.52	0.767

Obstacles to learning

The questionnaire asks students if they had thought about withdrawing from the paper (Table B7). Most respondents had considered leaving the paper (54 out of a total of 81 respondents). The reasons were scaled from small influence to very strong influence. All of the reasons supplied averaged around the rating 2, a moderate influence.

Table B7: Obstacles to learning

	Obstacles to learning	Mean	Std dev	N
1	The paper was not what I expected	2.15	1.00	54

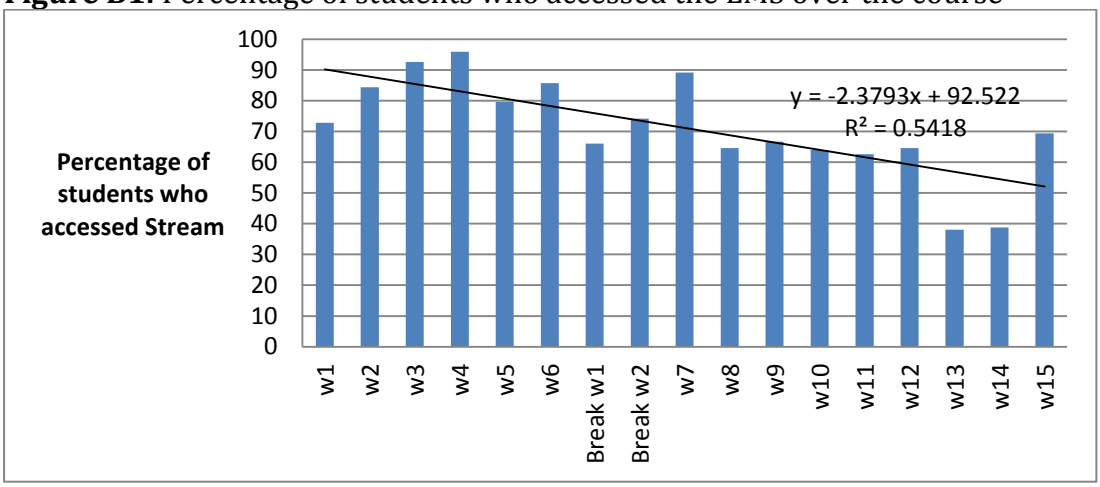
2	The assignment workload was too high	2.39	0.98	54
3	I could not understand the content	2.02	0.95	51
4	There were too many contact hours	1.83	0.81	52
5	I could not access the technology (*e.g.* computer) that was needed for the paper	1.81	0.95	52
6	I did not get enough support with administration issues	2.00	0.90	53
7	I did not get enough learning support from the lecturer	2.13	0.98	53
8	The teaching quality was poor	2.18	1.08	56
9	I had difficulties with the course staff	1.96	0.95	54
10	I had problems with other students on the course	1.43	0.64	53
11	Financial reasons	1.49	0.81	51
12	Personal reasons	1.67	0.94	52
13	Other (please specify)	2.33	1.53	3

The other reasons for students considering withdrawing included their perceptions of the course as tough and comments about the lecturer. One student added, "Lecturer is hard to understand, but I know he tries. Apart from that the teaching is good."

Student use of the learning management system

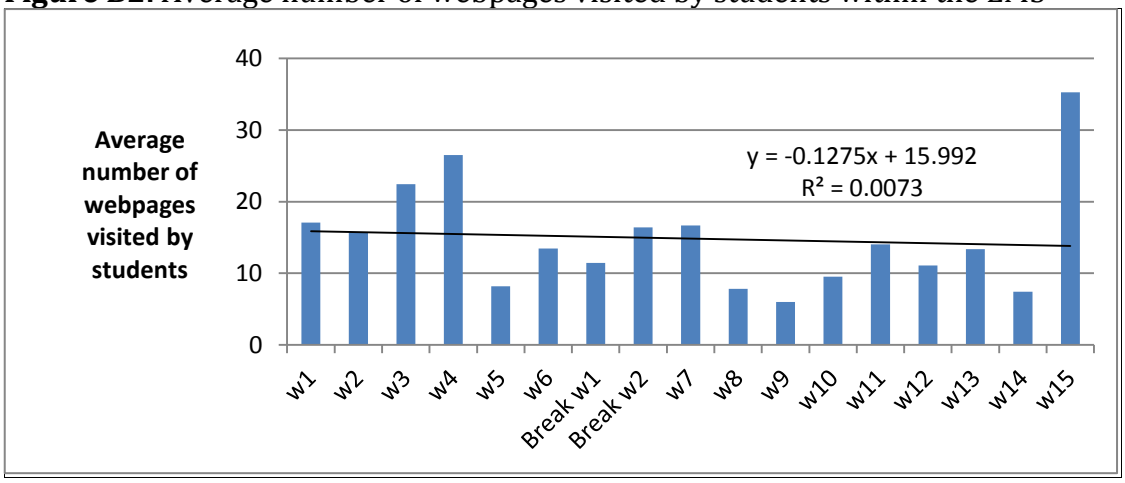
The LMS recorded the date that a student visited a webpage within the LMS. The researchers collected this data at the end of each week for the duration of the course. Overall, the percentage of use of the LMS ranged from 63 *per cent* to 96 *per cent*, except for two weeks towards the end of the course which averaged 39 *per cent*. In the first four weeks of the course there was a steady increase in the percentage of students who used the LMS, but over the 15-week course there was a trend of declining use (r^2= 0.54; see Figure B1).

Figure B1: Percentage of students who accessed the LMS over the course



On average, students visited 16 webpages within the LMS. Students used the LMS over the midterm break and the highest use was recorded in the final week of the course, just before the exam (Figure B2). There was a spike of activity in the final week of the course, especially just before the exam. There were 44 students who viewed the LMS after 9pm on the night before the exam, some of whom worked on the LMS through the night just before the morning exam.

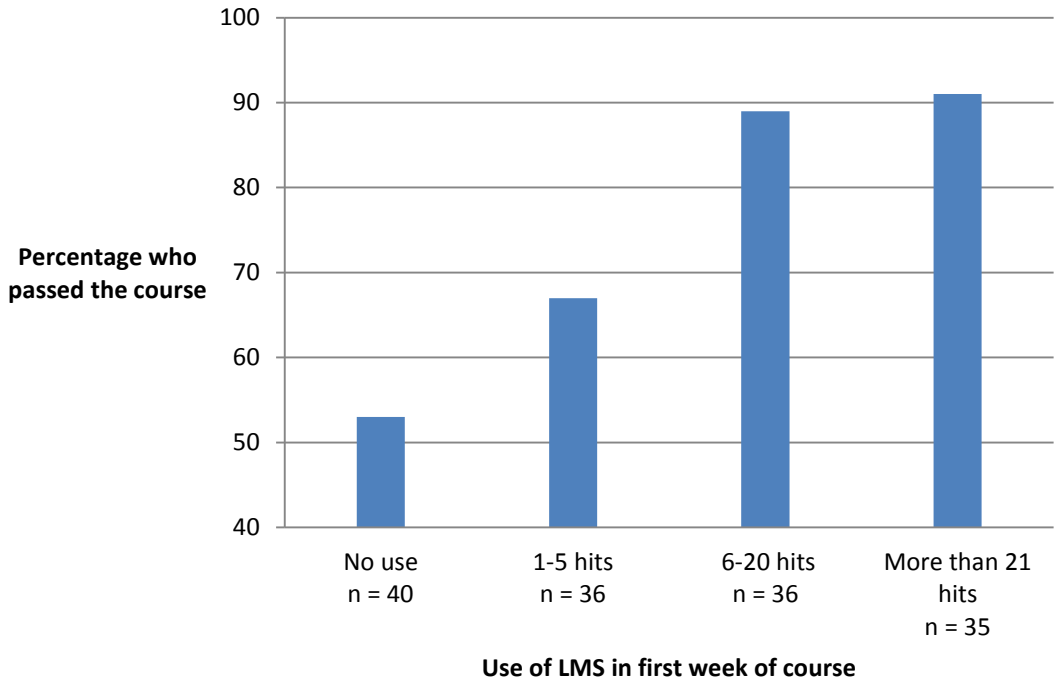
Figure B2: Average number of webpages visited by students within the LMS



Aspects of usage were compared to the final marks. This included use of the LMS in the first week, the overall usage and the use of quizzes.

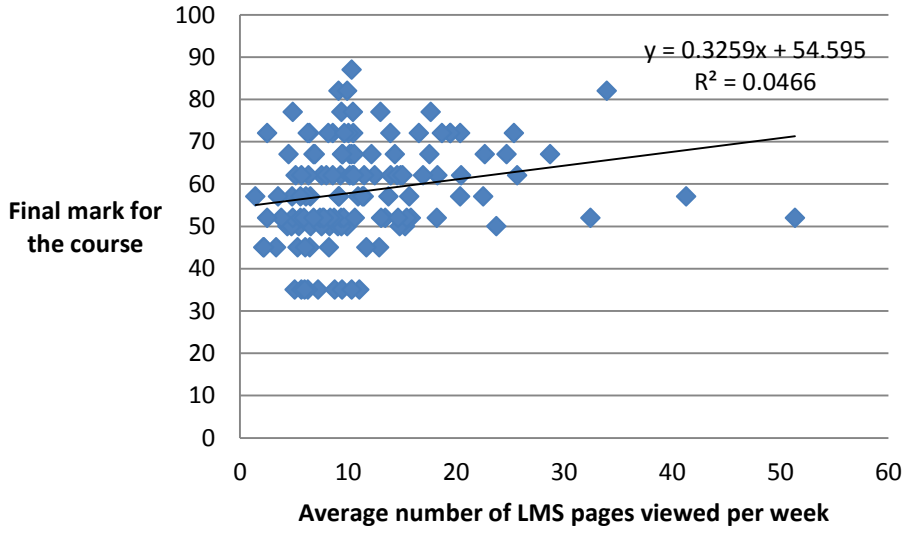
The usage for the first week of the semester was compared to the number of students who passed the course (Figure B3). Successful students were more likely to use the LMS in the first week.

Figure B3: The number of students who passed the course grouped by use of the LMS in the first week of the semester



The overall usage was compared to the final mark for the course. There was no association (r2= 0.05, see Figure B4). Table B4 does show the broad categories outlined in Mackie and Maltby (2007) of traditionalist (low use of LMS but good final mark), model (high use, good final mark), disengaged (low use, lower final mark) and geek (high use, lower final mark).

Figure B4: Student use of LMS compared to the final mark for the course



The average LMS use for all of the semester was grouped into those who took the final exam and passed and compared to those who failed. Those who passed averaged 12 LMS pages a week while those who failed average 7 ($p<0.01$).

The online quizzes were available from week six to week 12 with a new quiz available each week. About a third of the students did one or more of the quizzes. The association of quiz participation and final mark are in Table B8. Those students who did the quiz were represented more than expected in the A, B and C final grades and less than expected in the failed or did not complete categories (ChiSq=16.4, 4df, $p<0.01$). Overall, the students who did the test obtained a higher average final mark than those who did not (Mean 61, 57, $p<0.01$).

Table B8: Association of final marks with student participation with online quizzes

Final mark	Did not do quiz	Did quiz	Total
A	3	6	9
B	33	17	50
C	31	19	50
Fail	17	1	18
DNC	18	2	20
Total	102	45	147

Results from other interventions

Discussion forums were set up and invited discussion about the assignments. This generated little discussion.

Students who were not using the LMS in the first five weeks of the course were sent an email from the lecturer. Thirteen students were sent an email that overall had little impact on the use of the LMS, except for one student who started to regularly use the system and ended the course with a B. Of the thirteen students who were sent emails, five did not complete, three failed the course and five passed.

Those students who had withdrawn or had very low usage of the LMS were invited to an interview. One student took up this invitation. He withdrew because of illness.

Conclusions

These pilots set out to investigate the toolkit and test the survey instruments and techniques to identify student engagement and the impact of various interventions that aimed to improve student engagement. The LMS provided useful data on student use of the system. At the early stages of the course it is important to get students involved so they can successfully complete. Data shows that those who use the LMS in the first week of the course get better final marks. It is a challenge to get those who do not engage early to pass the course and research outlines that there are many reasons why students do not engage.

Getting input from students in surveys is problematic and needs careful planning. The online surveys had much lower return rates than paper-based surveys delivered in class time. The main trial will survey using surveys at the beginning and end of the courses.

Accessing students who do not engage is difficult. Only one student accepted the invitation to an interview. Gaining access to these people may be more successful if we work though university support structures such as the Student Success Advisors, who may have established relationships with some of the students.

Overall, the surveys collected rich data that illuminate student engagement and will indicate the impact of the interventions.

References

Jeffrey, L. M., Atkins, C., Laurs, A. and Mann, S. (2005). E-learner Profiles: Identifying Trends and Diversity in Student Needs, Orientations and Aspirations. Report on Research Findings of TeLRF Project: E-learning Profiles Diversity in Learning. Wellington: Ministry of Education.

de Vaus, D. (2004). *Surveys in Social Research*. New York: Routledge.

Appendix C: Questionnaires

Table C1: Students' preferences for various teaching modes
(See Table 3 in Results section)

	Teaching Mode	Strongly dislike	Dislike	Neutral	Like	Strongly like	N	Mean	Std dev
1	Printed study materials such as study guides, textbooks	1	4	15	36	24	80	3.93	1.00
2	Mixture of online and lectures	0	4	20	39	17	80	3.81	0.91
3	Tutorials	0	4	29	28	19	80	3.73	0.96
4	Lectures	1	6	21	35	17	80	3.72	1.00
5	Fully online courses	2	8	30	24	15	79	3.44	1.13
6	Online discussions, chatrooms developed by teachers	0	8	33	23	14	78	3.42	1.12
7	Group projects	2	14	33	20	6	75	2.95	1.22
8	Student presentations	5	12	28	21	8	74	2.93	1.36

Table C2: Student experience of support
(See Table 4 in Results section)

	Experience of support	Not used	Not helpful at all	Not helpful	Helpful	Moderately helpful	Very helpful	N	Mean	Std dev
1	Other students	5	3	8	36	23	5	75	3.25	0.89
2	Teaching staff	4	0	2	25	29	20	76	3.88	0.83
3	Administrative staff and services (secretaries, course advisors *etc*)	10	2	4	32	23	8	69	3.45	0.88
4	Student learning services	12	1	4	30	22	11	68	3.56	0.89

Table C3: Students' engagement with the paper
(See Table 5 in Results section)

	Student engagement question	Never	Not very often	Some times	Occas-ionally	Often	Very often	N	Mean	Std dev
1	Worked harder than you thought you could to meet a teacher's/tutor's standards or expectations	0	6	10	38	17	6	77	3.09	0.99
2	Read the textbook, or other material from the teacher (*e.g.* study guides or hand outs)	0	2	10	23	31	12	78	3.53	0.99

3	Prepared for class (*e.g.* reading, exercises *etc*) beforehand	3	3	17	24	25	4	76	3.01	1.14
4	Spent more than 30 minutes on practice exercises, questions, or activities	3	3	9	28	24	10	77	3.26	1.19
5	Spent more than 30 minutes studying for a test/exam or working on an assignment	0	0	1	13	23	41	78	4.33	0.80
6	Asked questions or contributed to discussions in class or online	0	8	12	33	16	9	78	3.08	1.11
7	Worked with other students on projects during class	8	12	9	29	17	3	78	2.56	1.36
8	Worked with other students outside class to prepare assignments	13	18	8	17	16	6	78	2.29	1.60
9	Discussed ideas from your readings or classes with people from outside of your class (*e.g.* family or students from another class)	5	10	19	23	15	6	78	2.65	1.32
10	Prepared two or more drafts of an assignment before handing it in	3	13	19	19	14	10	78	2.74	1.38
11	Used library resources online or on campus	1	1	5	7	26	38	78	4.18	1.07
12	Used ideas or concepts from other courses to help with this one	0	0	7	31	28	12	78	3.58	0.86
13	Used an online learning system (*i.e.* Stream, Moodle or Blackboard) to discuss or complete an assignment	2	2	5	22	26	21	78	3.68	1.17
14	Met with a study group	17	8	17	21	10	5	78	2.18	1.53
15	Discussed your marks or assignments with teaching staff on this course	10	13	16	19	14	6	78	2.41	1.48
16	Talked about your career plans with teaching staff or advisors	21	19	12	14	8	4	78	1.76	1.53
17	Discussed ideas from your readings or classes with teaching staff outside class time	13	20	17	16	7	5	78	1.99	1.45
18	Used email or a forum to communicate with the courses teaching staff	4	8	10	27	19	10	78	3.01	1.33

Table C5: Obstacles to learning
If you ever thought about withdrawing from this paper, tell us how strongly the reasons below made you want to leave. Answer ONLY those that had an influence on you. Skip this section if you did NOT consider withdrawing.
(See Table 7 in Results section.)

	Obstacles to learning	Small influence	Moderate influence	Strong influence	Very strong influence	N	Mean	Std dev
1	The paper was not what I expected	18	15	16	5	54	2.15	1.00
2	The assignment workload was too high	11	19	16	8	54	2.39	0.98
3	I could not understand the content	18	18	11	4	51	2.02	0.95
4	There were too many contact hours	21	20	10	1	52	1.83	0.81
5	I could not access the technology (*e.g.* computer) that was needed for the paper	27	10	13	2	52	1.81	0.95
6	I did not get enough support with administration issues	18	20	12	3	53	2.00	0.90
7	I did not get enough learning support from the lecturer	18	14	17	4	53	2.13	0.98
8	The teaching quality was poor	19	17	11	9	56	2.18	1.08
9	I had difficulties with the course staff	21	18	11	4	54	1.96	0.95
10	I had problems with other students on the course	34	15	4	0	53	1.43	0.64
11	Financial reasons	34	11	4	2	51	1.49	0.81
12	Personal reasons	31	10	8	3	52	1.67	0.94
13	Other (please specify)	1	1	0	1	3	2.33	1.53