Final Report

2011 Echo360 International Research Fund Project

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Investigating Student Study Behaviours in Blended-learning Environments to Enhance Retention

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Investigating student study behaviours in blended-learning environments to enhance retention

1. Institutions
Murdoch University, Perth, Western Australia, Australia
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1.1. Project team
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2. Planned objectives and outcomes
This research was planned to investigate three semester-length courses/units\(^1\) that were designed to introduce students to the university environment, and that thoughtfully blended technology and communication between teachers and students.

The three courses initially planned for investigation\(^2\) were:
- T100: *Introduction to University Learning*, offered at two campuses in on-campus, blended and distance modes;
- F100: *Foundation Unit*, offered at one Australian campus and transnationally, and in on-campus, blended and distance modes;
- E10x: One of several introductory first year teacher education courses, offered at several campuses in on-campus blended and online modes;

\(^1\) A course (also known as a unit) is a single subject, usually making up one eighth of a year of full-time study.

\(^2\) Pseudonyms have been used for course codes, to ensure anonymity.
2.1. Research question

In what ways do students in different studying contexts interact with blended-learning designs in their first year of university? Within this study, 'contexts' includes items such as diverse backgrounds, locations and modes of study; and 'blended-learning designs' specifically includes the use of the Echo360 lecture recording system and the Blackboard learning management system, in conjunction with physical classroom attendance.

2.2. Method

The methodology employed in the study was derived from the mixed methods approach that was developed in our 2009 Echo360 grant (Phillips, et al., 2011; Phillips, et al., 2010), using learning analytics, interviews and grades, and using data from a survey to select our sample. The planned stages and processes involved:

- Administering a brief survey into students' demographic background exploring areas such as: socio-economic status, first in family, school leaver/mature, school performance, expectations of academic success. This survey was used to identify an initial sample of students with diverse characteristics.
- Using learning analytic tools to refine the initial sample, to identify a sample of students with different technology usage patterns and with diverse characteristics. These tools include our Lectopia learning analytic tool, Dawson's (Dawson, Bakaria, Lockyer, & Heathcote, 2011) SNAPP social network analysis tool, and manual analysis of Blackboard usage reports.
- Interviewing 24-30 students, 8-10 per course.
- Extracting grades for assignment tasks and final course results.
- Combining grades, interview transcripts and usage behaviours to tell the unique story of each student in the sample to create a number of case studies.
- Looking for patterns and differences among stories, and identifying successful and unsuccessful behaviours.

2.3. Proposed outcomes and dissemination

The aim of this research was not to produce generalisable principles to enhance retention among at-risk students – the phenomena under question are too complex and inter-related. However, we expected the research to produce rich, qualitative descriptions of how some students behaved in some contexts, and to derive some prototypical design principles that might inform others on how to design blended-learning environments that facilitate and support retention.

The expected outcomes of the study were:

- A refined methodology which can be applied to other blended-learning contexts
- A refined learning analytic tool which works with the EchoSystem
- An improved understanding of how students in introductory university studies, including those at risk of dropping out, can effectively use a blended learning environment.

Dissemination of this project was planned to occur through various means, to a range of different stakeholders, specifically:

- Presentation of the project and its findings at a 2012 or 2013 Echo360 User Conference;
Progress towards the achievement of these outcomes and deliverables, and the barriers encountered, are discussed below.

2.4. Project background
The research was carried out during 2012. At this time, Murdoch University used the Lectopia product, and the University of Newcastle was using the Echo system for the first time.

The conduct of the research was impacted by a number of factors which both delayed the completion of the research and restricted the source and amount of data collected. These included various staffing issues, including the employment of research assistants, and the relocation and leave requirements of team members. Further factors (and their impacts) are discussed further in appropriate parts of the report below.

In response to some of these practical and substantive issues, a project extension was requested and granted in July 2012.

3. Achievement of outcomes
In spite of these problems, the project was satisfactorily completed, albeit using modified methods and cohorts than originally planned, and as described below.

3.1. Refined methodology – survey development
A survey was developed, trialled and validated. The survey was based in part, with permission, on questions in the Australasian Survey of Student Engagement (AUSSE) developed by the Australian Council for Educational Research (see http://www.acer.edu.au/ausse).

Questions were developed in the following categories:
- Living and travel arrangements
- Study context
- Time use
- Expectations of study
- Parents’ educational level
- Lecture attendance patterns
- Online study behaviour

The survey questions underwent several cycles of review, both within the team and with the assistance of Murdoch University’s in-house survey expert. A trial version of the survey was put online in the Murdoch Online Survey System, and piloted in a first year course (pseudonym E100) also an entry level course for commencing education students.

To minimize the time spent completing the survey, demographic data was sourced directly from the University student records system. This included the students’ age,
tertiary entrance rank and home address. The home address was used to identify each student's socioeconomic status by matching it against readily available Australian Bureau of Statistics (ABS) data.

In the survey trial, each group of questions was followed by an additional open-ended question for respondents to explain any issues they had understanding the purpose or intent of each question. Thirty nine students responded to this survey, and several made comments about questions in the survey that they felt were difficult to interpret. This feedback enabled us to revise the survey wording to improve clarity. This final survey is provided in Appendix A.

3.1.1. Outcomes
Survey developed, trialled and refined.

3.1.2. Barriers
No barriers were experienced in this part of the project.

3.2. EchoSystem learning analytic tool
The Lectopia learning analytic tool developed in our 2009 Echo360 research project was reviewed and upgraded based on the findings of that project. This included automatically excluding 'false hits' (brief periods of access to the system) and generating various disaggregated reports and graphs.

Changes in management structures in the IT Services department at Murdoch led to delays in deploying the revised Lectopia Tool and linking to a replica of up-to-date data. This delayed the student selection process.

Because ethics' approval was not granted to access Newcastle corporate data within the project timeframe, apart from basic conceptual work, no progress could be made on the development of an EchoSystem learning analytic tool.

3.2.1. Outcomes
The Lectopia learning analytic tool was revised and deployed.

3.2.2. Barriers
Delays in deploying the revised Lectopia tool caused by changes in management structures in the IT Services department at Murdoch University.

The development of the Echosystem learning analytic tool could not proceed without timely ethics' approval at the University of Newcastle to access system data.

3.3. Improved understanding of student study behaviours
The data collection aspect of the project was impacted by various factors, which acted as barriers to the conduct of the project as planned.

As noted above, the absence of Human Research Ethics approval from the University of Newcastle meant that no case study could be carried out there.

Planning continued to conduct two case studies at Murdoch University. However, the resignation of a research assistant delayed the preparation of the final survey. Similarly, delays in deploying the Lectopia learning analytic tool deferred the student selection
process until relatively late in the semester (that was beyond the optimal time for gathering data).

In consideration of these delays, the course coordinators of the F100 chose to withdraw permission to study that course. This left us with only the T100 case study. However, since we had already been working with students in E100 to trial the survey, we explored the possibility of including this as a second case. Ethical issues arose, because a member of the project team was course coordinator and some students had already contributed to the project, under a different set of conditions.

An ethics' amendment was submitted and approved, but under the condition that the people who had already provided survey feedback would have to explicitly allow us to use their data and give permission for something other than a trial. By the time these issues were resolved, it was the beginning of June 2013, the teaching part of the semester was complete, and students were studying for their exams. Prior to the 1st of June, 91 students had responded to the survey, but none of them gave subsequent permission for us to use their data. However, after the 1st of June, a further 34 students responded to the survey, and we were able to use their survey data and subsequently approach a selection of students for interview.

In summary, two case studies were conducted, with characteristics summarised in Table 1.

Table 1. Characteristics of the two cases, showing the distribution of students in different enrolment modes.

<table>
<thead>
<tr>
<th>Course</th>
<th>Enrolments</th>
<th>Survey responses</th>
<th>Response rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>T100: Introduction to Murdoch University Learning</td>
<td>Murdoch Campus Internal: 36 Rockingham Campus Internal: 25 External: 10 Total: 71</td>
<td>24</td>
<td>34%</td>
</tr>
<tr>
<td>E100: Introduction to Educational Technology</td>
<td>Murdoch Campus Internal: 159 Rockingham Campus Internal: 57 External: 78 Total: 294</td>
<td>125</td>
<td>43%</td>
</tr>
</tbody>
</table>

3.3.1. Details of the two case study courses

Both case study courses were designed specifically for first year students of diverse backgrounds. Both designs used lectures to provide a conceptual overview of course material (Bligh, 1972), but the focus of lectures was not on transmitting content. Similarly, the learning management system sites for both courses were not focused solely on making content available. Similarly, lecture capture recordings were of relatively low importance. In both cases, the learning design emphasised a constructivist approach, with students expected to complete learning tasks and activities, rather than absorbing content from lectures.

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3 A further consequence was that E100 students all responded to the trial version of the survey, while T100 students used the revised version. Changes to the survey were limited to wording amendments to make questions easier to interpret. Nonetheless, these amendments may affect comparison of the results (albeit these questions related mainly to the use of time during the week).

4 Students with an internal enrolment mode study face-to-face on one or more university campuses. Students with an external enrolment mode study by online distance education.
In T100, learning activities revolved around weekly three-hour tutorials for on-campus students. For external students, the tutorials were replaced by online discussion forums supported by tutors. Discussion forums were optional for internal students.

E100 was explicitly designed according to the authentic learning framework of Herrington, Reeves & Oliver (2010). The course was structured around students’ creation of a portfolio-style public website over the course of the semester. The website contained artefacts developed by students as assessment items, supported by online and face-to-face tutors and a ‘companion website’ with links to resources students might find useful in developing their artefacts. In E100, discussion forums were emphasised for external students, and available to those internal students who wanted to use them.

In summary, both courses used innovative designs which de-emphasised content delivery as a principal means of instruction.

3.3.2. Lectopia usage data

The second step of the method was to use learning analytic tools to refine the initial sample, to identify a group of students with different technology usage patterns and with diverse characteristics. This was based on an assumption that all courses would use the Lectopia Blackboard interface to access lecture recordings. This interface is the mechanism through which usage data is logged. However, both case study courses used non-standard mechanisms to access lecture recordings.

In T100 lectures were pre-recorded in a studio setting and students were given direct links to individual recordings in the LMS. The Lectopia interface was not used, and, therefore, no usage data was recorded.

Similarly, in E100 students were given a choice of using the Lectopia interface to access lecture recordings (and hence have this access recorded), or subscribing to the recordings as automatically downloaded podcasts through iTunes (with no access recorded). Because of this alternative access method, usage data was recorded for only some of the students who accessed the lecture recordings.

While this was disappointing from a learning analytics point of view, it had minor impact on the study, because we asked about Lectopia usage frequency in the survey, and we were able to use this data instead.

3.3.3. Selection process

The next stage of the methodology was to create a short list of students with diverse characteristics and behaviours to consider for in-depth interviews, to develop rich descriptions of their behaviours. To provide a basis for this selection, the survey results were combined with Lectopia usage statistics, where appropriate.

Descriptive statistics and a correlation matrix were derived from the combined data. Analysis of these results led us to select the following variables as indicators of diverse behaviour:

- SES status;
- enrolment mode;
- university entrance score and mode;
- F2F lecture attendance;
- LMS use;
• Lectopia use (from survey and/or usage data);
• parents' level of education;
• age and gender.

Some of the available records had to be discarded because explicit consent was required in the survey for contact to be made for an interview (noting previous comments about the use of E100 as the second case). This resulted in consent being given for 17 of the 24 responses for T100, and 26 of the 125 responses for E100.

Analysis of the data for diversity among these 43 students identified 11 students in T100 and 11 students in E100. These students were coded as T1-11 and E1-11 respectively. An individual profile document was developed for each short-listed student. This profile combined all relevant survey and usage information into one document that could be used to guide the interview process. Because of the delays discussed above, the short-listing process was not completed until after the end of the examination period. This meant that assessment results could be included in the profile. An example profile for student T1 is provided in Appendix B.

3.3.4. Interviews

The next stage in the process was to contact students to arrange interviews. These were initially planned to be held in June/July, but could not be conducted because no suitable research assistant was available. It was also delayed by the workload on the project team, interspersed by leave requirements.

A suitably qualified research assistant was located in October 2012, enabling interviews to be conducted in November, after the end of second semester exams. Contact with students was made only after the end of the academic year. This restricted the number of students who made themselves available to be interviewed. In total, six students were interviewed, four from T100 and two from E100. While the number of interviewees was smaller than intended, the in-depth nature of the interviews provided an emphasis on deeper exploration of the issues rather than breadth. The conduct of the interviews one semester later than planned may also have impacted on the responses provided, because the time delay may have affected students' recollection of events. Alternatively, the delay may have assisted the students' reflection and consolidation of knowledge, and this was certainly our impression in some of the interviews.

3.3.5. Outcomes

The short-listing and selection process proceeded, and valuable, in-depth data was obtained from six students.

3.3.6. Barriers

A case study could not be carried out at the University of Newcastle, because ethics approval was not granted in time.

Delays in developing the survey (resignation of research assistant) and deploying the Lectopia tool (IT Services issues) led to the withdrawal of one of the Murdoch cases.

A requirement to seek an amendment to the original ethical approval delayed the inclusion of a replacement case at Murdoch, and the conditional approval restricted access to students who could be interviewed.
The resultant small sample size restricted our ability to investigate a range of student behaviours, but it did permit more in-depth exploration and analysis of issues.

3.4. Related outcomes

Applications relating to this research agenda were made to two granting bodies (see Table 2). Both were unsuccessful, but both involved industry contributions from Echo360.

**Table 2. Applications for research funding.**

<table>
<thead>
<tr>
<th>Funding Body</th>
<th>Project</th>
<th>Total value of grant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australian Research Council Industry Linkage grant, 2011</td>
<td>The interplay between students' study behaviour and teachers' educational designs: Successful use of blended-learning environments in higher education</td>
<td>$536,358 total cash amount over three years, including Echo360 cash contribution of $A75,000 p.a.</td>
</tr>
</tbody>
</table>

3.5. Dissemination

A paper entitled *Exploring Learning Analytics as Indicators of Study Behaviour* was presented and published at the 2012 EdMedia World Conference on Educational Multimedia, Hypermedia and Telecommunications (Phillips, Maar, Preston, & Cumming-Potvin, 2012) in Denver, Colorado.

Results of this grant were also presented at a Learning Analytics Workshop held by the Australasian Council on Open, Distance and E-learning in November 2012.

4. Budget and expenditure

The planned and actual expenditure of the project is provided below in Table 3, indicating that it was successfully completed within budget.

**Table 3. Expenditure summary.**

<table>
<thead>
<tr>
<th>Item</th>
<th>Grant (SUS)</th>
<th>Grant (A$)</th>
<th>Actual (A$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research assistant: monitor data and conduct interviews</td>
<td>$5,500</td>
<td>$5,868</td>
<td>$3,183</td>
</tr>
<tr>
<td>Analyse data</td>
<td>$0</td>
<td>$0</td>
<td>$1,500</td>
</tr>
<tr>
<td>Transcription</td>
<td>$1,000</td>
<td>$1,067</td>
<td>$515</td>
</tr>
<tr>
<td>Programmer</td>
<td>$2,000</td>
<td>$2,134</td>
<td>$2,000</td>
</tr>
<tr>
<td>Final Report writing</td>
<td>$0</td>
<td>-</td>
<td>$1,500</td>
</tr>
<tr>
<td>Website admin</td>
<td>$0</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>University overhead (15%)</td>
<td>$1,500</td>
<td>$1,600</td>
<td>-</td>
</tr>
<tr>
<td>Interview recompense</td>
<td></td>
<td></td>
<td>$210</td>
</tr>
<tr>
<td>Travel</td>
<td></td>
<td></td>
<td>$390</td>
</tr>
<tr>
<td>Newcastle University contribution</td>
<td></td>
<td></td>
<td>$1,000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$10,000</strong></td>
<td><strong>$10,668</strong></td>
<td><strong>$10,298</strong></td>
</tr>
<tr>
<td>Surplus</td>
<td></td>
<td></td>
<td>$370</td>
</tr>
</tbody>
</table>

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5. Research Results

5.1. Methodology

The methodological approach used to select students for investigation was described in the previous section 3.3 "Improved understanding of student study behaviours".

Six students agreed to be interviewed, using a semi-structured interview schedule, that was personalised with data from the individual profiles discussed above. The interview schedule is shown in Appendix C.

The interviews were recorded, transcribed and analysed to 'tell the story' of each student as a rich description of the data. Individual members of the research team constructed the rich descriptions by drawing on the profiles, interview transcripts and available learning analytic data (Lectopia learning analytic tool, the SNAPP social network analysis tool and manual analysis of Blackboard usage reports). Each case description was structured around the following headings:

- Background including 'first in family', etc.
- Working/ studying/ family/ personal context
- How students spent their time
- Coping strategies
- Their disposition to, and use of, technology
- Motivation, expectation and the final assessment result

The first draft of the rich description was then reviewed by a second team member to ensure that all relevant data was included, and to further ensure consistency of research and corroboration of descriptions.

A cross-case analysis was then performed, by identifying and grouping the themes which arose from each student case. The analysis identified similarities and differences across the study participants, as described below.

5.2. Profiles

The profiles of the six students interviewed are summarised in Table 4. The bottom section of Table 4 contains four rows referring to the hours spent per week on various activities. These categories were derived by aggregating results from several survey questions, as follows:

- Total Study hours was derived from three variables: hours preparing for class, hours spent on campus; and hours spent using online technologies to do university work.
- Hours working corresponds to a single survey variable: hours week working for pay.
- Hours home duties was derived from two variables: hours providing care for dependents; and hours managing personal business.
- Hours for self was derived from two variables: hours participating in organised group activities; and hours relaxing and socializing.
Table 4. Summary of interviewed student characteristics derived from survey data.

<table>
<thead>
<tr>
<th>Case</th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
<th>E1</th>
<th>E2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Course</td>
<td>T100</td>
<td>T100</td>
<td>T100</td>
<td>T100</td>
<td>E100</td>
<td>E100</td>
</tr>
<tr>
<td>Gender</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>F</td>
</tr>
<tr>
<td>Age</td>
<td>49</td>
<td>18</td>
<td>51</td>
<td>18</td>
<td>39</td>
<td>44</td>
</tr>
<tr>
<td>Enrolment mode</td>
<td>External</td>
<td>Internal</td>
<td>Int/Ext</td>
<td>Ext/int</td>
<td>External</td>
<td>External</td>
</tr>
<tr>
<td>Socio-economic status</td>
<td>Low</td>
<td>High</td>
<td>Medium</td>
<td>Medium</td>
<td>Medium</td>
<td>Medium</td>
</tr>
<tr>
<td>Full/part time</td>
<td>Full time</td>
<td>Full time</td>
<td>Part time</td>
<td>Full time</td>
<td>Part time</td>
<td>Part time</td>
</tr>
<tr>
<td>Parent attended university</td>
<td>n</td>
<td>y</td>
<td>n</td>
<td>n</td>
<td>y</td>
<td>n</td>
</tr>
<tr>
<td>Self-perceived performance</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>Problems</td>
<td>OK</td>
<td>OK</td>
</tr>
<tr>
<td>Motivation to succeed.</td>
<td>Try hard</td>
<td>Try hard</td>
<td>Try hard</td>
<td>Try Hard</td>
<td>Try, but</td>
<td>Try hard</td>
</tr>
<tr>
<td>Total study hours</td>
<td>56-60</td>
<td>18-30</td>
<td>18-30</td>
<td>28-40</td>
<td>17-25</td>
<td>32-40</td>
</tr>
<tr>
<td>Hours working</td>
<td>20</td>
<td>6-10</td>
<td>30+</td>
<td>6-10</td>
<td>0</td>
<td>16-20</td>
</tr>
<tr>
<td>Hours home duties</td>
<td>26-30</td>
<td>6-10</td>
<td>41-45</td>
<td>1-5</td>
<td>46-50</td>
<td>42-50</td>
</tr>
<tr>
<td>Hours for self</td>
<td>12-20</td>
<td>12-20</td>
<td>2-10</td>
<td>2-10</td>
<td>12-20</td>
<td>6-10</td>
</tr>
<tr>
<td>% Marks</td>
<td>72</td>
<td>63</td>
<td>74</td>
<td>70</td>
<td>65.5</td>
<td>80</td>
</tr>
</tbody>
</table>

Two respondents (T2, T4) were 18 year old school leavers who lived with their parents, while the other four respondents were aged between 39 and 51, and obtained alternative entry to university. Both 18 year olds came from migrant backgrounds, and all respondents had Australian citizenship. T1 and T3 were single parents with child-minding responsibility, while E1 and E2 lived with their partners and children.

Three respondents were enrolled internally (on-campus) while three respondents were enrolled externally. However, five respondents lived in the Perth metropolitan area, and had the option to enrol in either internal or external modes. One respondent (T4) was normally an internal student, but chose to study the case-study course externally "I just wanted to try something new – giving it a shot externally. ... if I want to do other studies I can see if I can handle the external studies". A second respondent (T3) was normally an external student, but chose to study the case-study course internally because the days suited her. Of the two other respondents who lived in the city, E2 chose to study externally because she is raising a family and working part time (50%) as an education assistant, while E1 had full-time caring responsibilities.

Both younger students and the person from a regional area were enrolled full-time, while the others were enrolled part-time.

The majority of respondents came from medium socio-economic status localities, and the parents of four respondents had not attended university (T1, T3, T4, E2).

In Table 4, the two younger students reported working 6-10 hours per week, and, in line with their 'unencumbered' status, spent relatively small amounts of time on 'home duties'. The four older students, on the other hand, had very busy lives.

Full-time student T1 worked 20 hours per week, spent 26-30 hours on home duties, with 12-20 hours for herself, as well as studying full time 56-60 hours/week, while enrolled in three courses. She suggested that she may be a little "over diligent" and said that she "doesn't like being unprepared". T1 found that study at Murdoch was much more rigorous than previous university study in the USA:

"It was hard in the first semester - getting back into the swing of things. It was a little harder than I had anticipated."
Eighteen year old T2 was a full-time student who allocated 18-30 hours per week for study, while working and doing home duties for 6-10 hours respectively. She also allocated 12-20 hours for herself.

Part-time student T3 worked a total of 72 hours a fortnight as a full-time clinical nurse. She also spent 41-45 hours on home duties, spent only 2-10 hours on herself, and allocated 18-30 hours to her university work. She expressed some concern about the impact on her personal life of her working and study context:

"I try and catch up with my boyfriend who I don't live [with]... I suppose if you're married with someone you may take for granted that time because you're in the house with them". [T3]

Student T4 was enrolled full-time and spent 28-40 hours on university work. She worked 6-10 hours, spent only 1-5 hours on home duties and spent 12-20 hours on herself. She agreed with these figures during the interview, but there was a possibility that she may have answered the survey questions about time for a single course. However, T4 also agreed with the statement from the interviewer that she felt she was studying very hard, adding that she had studied on the day of the interview, which was after the end of the academic year.

Part-time student E1 did not work but spent 46-50 hours per week on home duties, with 12-20 hours for herself and 17-25 hours for university. The interview indicated that she was quite committed to her caring duties. However, the interview suggested (ambiguously) that E1 may have provided hours for each course she studied. "I think that was in total that I mean that I spent on a unit."

In the interview, E1 also questioned whether the hours she reported in the survey were overstated:

"mmm, probably not that much I'd say."

E2 worked 16-20 hours, allocated 42-50 hours to home duties and 6-10 hours to herself. She also spent 32-40 hours studying per week. She felt that 16-20 hours/week preparing for class was appropriate, because "For each unit expected that we would do 10 ish hours so yeah overall it's about 8 to 10 each unit."

5.3. Technology Use

All respondents used a range of technologies for their study. To a large extent, this was because students were required to use technology for their study, namely library databases, Google, Wikipedia, the Learning Management System and the Lectopia lecture capture system. E2 reported using Skype to collaborate on a group assignment. The group continued to use this as a way to keep in contact with other external students.

Of the six respondents, T1 and T3 were least comfortable with technology. T1 explained that it took her half of the first semester to "get the hang of the online environment". Once this had been mastered, she found the process more streamlined. However, T1 found that time spent reading and researching is more valuable than time spent online and therefore she spent comparatively less time on the computer:

"I probably haven't spent quite as much time on the computer, I've spent more time reading and research and you know assignments and stuff like that."

T3 admitted that "she was a bit of a technophobe", including using library databases for research purposes, which she said she did not know how to do. T3 also indicated that
she still wrote her essays and assignments by hand, and later typed them up for submission.

When studying, T2 often used Google and Google Scholar in preference to search engines and other resources on the university library’s website. T2 said that she and other students found these resources quite difficult to use:

“It didn’t come up with very relevant articles whereas Google Scholar would actually come up with some useful articles. I mean and I thought maybe it was just me, maybe I’m not searching it correctly but as I was asking around when I was at uni a lot of other people were finding you know the Murdoch site a bit weird as well, like they felt like they were wasting their time, they couldn’t find proper articles for their assignments.”

T1 noted that working online is very different to being in a classroom. She commented that she is a visual and audio learner and likes the atmosphere in a classroom. It was very hard for T3 to adjust to the reading comments online; she felt that she had lost a feeling of connectedness. Internal study was her preferred option and she will do this in 2013:

“I’m very much a visual and audio learner and I like the whole classroom atmosphere so it was very hard for me to adjust to the reading comments online all the time and you know having that feeling of you know connectedness.”

The major technologies required for both courses were the Blackboard Campus Edition Learning Management System (LMS) and the Echo360 Lectopia lecture capture system.

**LMS**

Four respondents (E1, E2, T3, T4) were heavy users of the LMS, with reports of ‘almost daily’ access.

E1’s LMS use was very conscientious:

“I check everything, every single bit of information that they’d put on there just to see that I know everything”.

Her interview response was confirmed by the LMS usage logs, which indicated that E1 viewed or downloaded nearly 400 pieces of content. While not daily, the LMS usage logs indicated heavy use with 113 separate logins and a total of over 35 hours logged into the system over the semester. E1’s approach was to print documents and put them away for use on a weekly basis. E1 remarked that she also used the LMS to verify course processes and information on a weekly basis, but she commented that her LMS use is concentrated in the middle of semester, with a dip towards the beginning or end of this time frame. This was confirmed by her recorded LMS access patterns, and was consistent with the course structure, which focused on authentic assignment tasks.

T4 said that she used the LMS to check for discussions about assignments and to download lecture slides. Her LMS activity is confirmed by usage logs which showed extensive use of the LMS, primarily to view content and read forum messages. T4 also reported:

“looking] over … assignments, cover sheets and all that and the criteria, if they put the marking criteria for the assignment”.

As noted above, T1 was less comfortable with technology. Her records showed that she used it less than most other students, and T1 stated that she “didn’t quite understand the whole LMS page”.

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T2 also accessed the LMS infrequently throughout the semester, for a total of 9.5 hours and in the interview she mentioned only the assignments in her use of LMS. T2 was an internal student, and had the opportunity to access course information on campus.

The course design for E100 did not rely solely on the LMS to access relevant information. Instead, students used the previously-described ‘companion’ website to access resources used for specific learning tasks in E100:

"But this other [companion?] website was very good, it had the most amazing information [about] the assignments that we had to do. They always had sample assignments, there were links to other websites which is where you would always get distracted ‘cause off you’d go on this little trip and before you knew you’d been sitting there for hours on the computer."

"it was very good in supporting the learners to know what was actually expected of them in terms of what we had to produce for our assignments and even producing the rubric and things like that so we knew what we were going to be marked against etc. So it was very well structured."

Lectopia
As noted earlier, Lectopia learning analytics data was not available for T100. Learning analytics data was only available for some students in E100, because there were two ways to access the recordings, and only one mechanism recorded learning analytic data. Fortuitously, learning analytic data was recorded for both E1 & E2. Survey and interview data also both provided evidence of Lectopia use.

The use of Lectopia was mixed across the study participants, depending on enrolment mode. The two students who were enrolled internally in the case study courses reported attending most face-to-face lectures, and used Lectopia sparingly. T2 did not use Lectopia for revision or to listen again to any lectures, only to catch up on the lectures that she had missed. The most useful thing for T2 was reviewing the slides from the lectures:

"I don't learn just by listening. Really it's not necessary for me just to listen or actually view the lecture. I mean I can just read and remember so I thought maybe I don't have to, and it's not like I don't have to do it again."

T3 said that she did not access Lectopia very often as she attended the lectures internally, but for other courses that she had studied externally, T3 would access Lectopia regularly.

In the interview, E1 confirmed survey results that she listened to lecture recordings weekly. This was also confirmed by the Lectopia usage data (Fig. 1). While E1 claimed that she "only listened to each lecture once", this was contradicted by the Lectopia usage data which showed she accessed two recordings a second time.

E2 found Lectopia to be useful and simple to use. Normally, she listened to the online lectures within twenty-four hours of the live lecture being delivered. In fact, E2 planned her days of study around the time the recordings became available:

"Pretty much the next day, quite soon after... Or that night, 'cause to organise yourself it's good to know ... when they actually put them on so ... you can plan what day you're going to do each unit."

E2 accessed 10 of the 11 Lectopia lecture recordings, in all but one case as a VGA screen capture, which included images captured from the screen of the lectern computer. Figure 2 shows the distribution of access across the semester. E2 listened consistently
over the first 4 weeks. There were no lectures in weeks 5 & 8, but E2 listened to the week 6 lecture in week 7. After week 8, she did not listen for several weeks, but then accessed three recordings in week 13. E2 listened to the final lecture in week 16.

Fig. 1. Lectopia usage for student E1, showing the weeks when lecture recordings were accessed. The weeks in which recordings were accessed for the first time are shown in blue (lower). Weeks in which recordings are accessed a second time is shown in green (higher).

Fig. 2. Lectopia usage for student E2, showing the weeks when lecture recordings were accessed. Instances where recordings are accessed within 24 hours of their availability are shown in blue. Access from between 4-7 days after recording are shown in green, and access more than a week after publication is shown in red.

E2’s explanation of her Lectopia usage behaviour was:

*Usually I watch it once. I’ve had to go back and watch a couple of them on the odd occasion just to refresh my memory. Usually I jot down some notes. I find them very easy to follow. I probably have a good work ethic in terms of retaining stuff so I don’t think I’ve gone back and watched too many and the one that I did actually go back and watch was because I actually fell asleep which is a bit embarrassing but I am a working mum.*

The gap between weeks 8 and 11 can be explained by the fact that E2 went on a holiday for 2.5 weeks while completing 2 assignments.

E2 expressed her satisfaction with Lectopia:

*...the beauty of being online is ... I don’t have to sort of sit there and listen to it all, there is a pause button.*

The technologically-challenged respondent T1 reported using Lectopia “fairly consistently” throughout the course, although she reported that it took half of the semester for her to work it out properly. T1 said that she found it easier just to
download rather than stream the recordings. She felt that Lectopia should be more streamlined so that every course you use the same format. This is because, in T100, the lectures were pre-recorded, and the standard Lectopia interface was not used to access lecture recordings. Instead, links to recordings were hard-coded into the LMS.

T4 reported using Lectopia every couple of days. We noted earlier that T4 was enrolled externally for T100, but internal overall. In this context, her response to questions about Lectopia use seemed to extend to the range of courses she was enrolled in, because the following quote assumes on campus attendance:

"Or if I couldn't make it to a lecture I would just listen to it [on] Lectopia."

T4 added further comment on the value of Lectopia, stating that it was a:

"really good revision tool like once, like especially when it's coming to exams it's just good to go over the stuff that you think you've forgotten, you can add extra detail to your notes."

Discussion Forums
As noted earlier, discussion forum use was optional for internal students (e.g. T2 & T3). Discussion forum use is likely to be a more important part of the study environment for the four students studying the case study units externally.

A common activity within the LMS was to access the Blackboard Discussion Board tool. However, a consistent behaviour across all interview respondents was to read discussion posts without personally responding. This 'lurking' behaviour (Beaudoin, 2002) resulted in no meaningful data being available from the SNAPP social network analysis tool.

While respondents were regular readers (for example, E1 read articles on 92 separate occasions), numerous respondents expressed frustration at the way the forums were used.

E2 was annoyed with others, who seemed to post "almost for the sake of it". She found that some students posted questions out of laziness or to minimise effort. For example, "how do I find this or how do I find that". E2’s response to such questions was:

"do you not read your stuff, it's right there for God's sake, and I won't answer it purely on principle because I think if I can find it you can bloody find it too, get off your bum and look for it."

E1 suggested that a good deal of interaction on the LMS was student ‘chat’ or ‘panic’ in relation to course requirements, but she appeared to use her time strategically:

"a lot of sort of panic, saying have you done this, have you done [that], you know stuff that I'm ... not going to get involved in that 'cause ... I have limited time."

"you find you're just ploughing through people asking questions that ..., if they looked, it is all there ... or in their book"

She also felt that some students posted "because you have to contribute sometimes for marks". However, E1 also found some useful information on the forums:

"but then you do get some that will go on and say someone's sent me how to do a screen capture. ... I read through and you can get any information"

T1 found the forums to be "a waste of time to be honest" and found that a lot of the posts were:
As an internal student, T2 did not engage in the discussion forums on the LMS, preferring instead to use her private email account to email her lecturer or course coordinator, or other students:

"I'd use my other email if I had any questions and email the lecturers or the unit coordinators or whatever."

T4 stated that she found it easier to participate in discussion face to face and explained her lurking behaviour as follows:

"I don't know I just don't really feel like it. I guess maybe it's just a certain privacy, I don't like other people like knowing what I'm asking and all that."

While she did not contribute to forums for T100 because she attended tutorials face-to-face, T3 explained that she contributed to discussions in the other, external courses she studied. She felt that a strength of the LMS and the asynchronous nature of the discussion forums enabled her to give more considered contributions:

"Interacting on LMS I think you've got a chance to think about things and you don't have to answer it straight away, like if the lecturer had said how do you feel about something and you're in class you've got to give an answer but on the LMS you can come back the next day and put the answer down you know and think about it."

Despite the frustrations expressed at the quality of discussions, respondents reported contributing on occasion to the discussion board.

Of the six students, E1 was the most active contributor to discussions, posting 13 messages over the semester. She stated that she attempted to contribute online when "there's something I can help with" or it is "something genuine" or "interesting", rather than "talking...for the sake of it". E1 also didn't feel inspired to contribute more, because "there's always someone that will put a bit of help up there for you and if they don't then the tutor just steps in."

E2 felt some obligation to contribute to discussions on occasions:

"I have to be careful and I do have to put in my 20 cents worth every now and again just so that people do know that I exist."

On the other hand, T1 had a more individual view:

"I posted... if there was something there I felt that it warranted me to comment on ... I'm just one of these people that unless I have something very important to say I, you know I don't say it."

Three of the four mature-aged students expressed concern about the lack of focus of online discussions. They expressed a mature and task-focussed approach to study, in contrast to the uncertainty expressed in much of the discussion. One respondent recognised the age and experience difference between herself and many of the school-leaver students, stating:

"I have to remind myself sometimes that that person being immature on there might actually be immature and I have to cut them some slack too."

The course design may have contributed to student frustration with the discussion boards. As noted earlier, in T100, discussion forums were optional for internal students...
(e.g. T2 & T3). Similarly, in E100, discussion forums were not emphasised particularly, but were just one of many tools to be used. A lack of focus on the explicit design of discussion tasks may have led to a perceived superficial use of the discussion board in these two courses. T1 provided an example of another course where there were two very specific online areas:

“One was for chats and one for tutorials and this worked a lot better.”

**Facebook**

The social networking service Facebook was used to varying degrees by respondents. In E100, Facebook was a required component of the course. Respondent E1 reported that, apart from this, she did not use Facebook. In fact, E1 commented that she had no interest in socializing on Facebook by describing her daily activities, posting pictures or “contacting people that she hasn’t seen for 20 years”.

Similarly, E2 was not a heavy Facebook user. As a working mother she did not “have time for that social sort of stuff”. However, E2 was a member of the university external students’ Facebook group. She didn’t find it particularly useful, because there was a lot of ‘social’ talk going on there. However, she felt that the general questions posted there were “far more appropriate for the kinds of questions that were on there rather than that stuff being on LMS”.

The four respondents from T100 were heavier Facebook users. Of the two younger respondents, T4 used Facebook daily, while T2 used it weekly, both for personal purposes. T3 was also a regular user, while T1 used it approximately once a month to catch up with friends in the United States. T1 commented: “Why am I supposed to use Facebook more? I think it’s just ‘cause I’m old.”

Only T4 used Facebook for study purposes, every few days:

“Sometimes, I asked my friends like if I’m stuck on an assignment, like what to do and all that.”

The other respondents did not use Facebook at all for study. T3 explained that she preferred to keep her social and professional communications separate:

*There’s a place for it, there’s a time for it I mean my workplace doesn’t allow Facebook ... [At] uni I think you’re there for a different reason – if you can’t live your life without Facebook, well what’s wrong with you?*

5.3.1. **Study**

Despite their different work and life contexts, the six respondents reported similar approaches to study. The four mature-aged respondents studied for 30-60 minutes, and then took a break for “a cup of tea”, “to do some housework” or “multitasking with the washing machine”.

T1 worked for a tourist operator, and was also able to “do a lot of reading” between busy periods at work. While she had a formal study at home, she found that she got more reading done when she was at work. She gave conflicting reports of her approaches to study. On the one hand, T1 reported that when she was at home she was always thinking about things that need to be done around the house. T1 also reported that, when listening to a lecture, she had to have a break half way through because she started nodding off.

On the other hand, when she studied Theology, T1 tended to: “get so absorbed in it [that she] forget[s] and next thing I know I can’t move when I go to stand up”. She could work for three or four hours at a time.

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The two younger students tended to study a little longer: "an hour or so", "around two hours".

Having a suitable, and quiet study space was important for all six respondents. In some cases this was a dedicated Study, in a bedroom, or the main dining area "when the kids are at school" or "after 8 o'clock when they've gone to bed". Although E1 could read on the screen, she preferred to read from print copies, which she could take to a quiet location of her house. Studying in silence was a consistent theme: "I can't have any noise on when I'm studying you know" [T3]. One of the younger students, T2, did not multitask, and did not try to study in front of the TV or on the phone, noting that she needed to give it her full attention. On the other hand, T4 "sometimes [but] not always" multi-tasked as she studied (e.g. with social networking sites).

Four of the six respondents expressed a view that they preferred to work alone. E2 did not feel the need to study with others "I'm a single, on my own kind of girl". T3 concurred – she did not work collaboratively much with other students, and generally did not seek out other students to interact with, either on campus or online. Although she had some study friends, generally T3 worked on her own. She noted that this was also her pattern during her first university degree.

T4 made a decision to study alone, because she "tried group study but just ended up talking about other stuff so it didn't really work". T4's comments in the Discussion Forums section also indicated a reluctance to share information with others.

T1, on the other hand, had little physical opportunity to work with others, because of her rural location. T1's pastor encouraged her to move to the capital city to get more discussion. T1 thought that she was a tactile learner. I've "got to be in amongst all the, everything." On the other hand, T1 did not take advantage of the discussion forum opportunities provided to her.

E2 reflected on her disinclination to work with others and identified its importance to her future profession as a teacher.

"I hate it when they make us do group work but the funny thing is we all seem to do it really well and we all seem to enjoy it when it's all over but at the time we just go oh why do they make us do group work. And we all sort of say well when we're teachers are we going to make children do group work and we all have a bit of a giggle about it so there you go."

Planning, scheduling and prioritising were important study characteristics identified by the interviewed students, particularly the more mature ones.

As a shift worker who might be called unexpectedly into work at any time, T3 attempted to organise her study patterns, allocating a day to each course she was studying:

Being a shift worker I don't have any particular time to study but I do have a room that I've set up as an office with the laptop and an L shaped desk and I have worked out that I'll do one subject, 'cause I'm busy Tuesday evenings, at present I work Tuesdays and I'm busy Tuesday evenings. So Tuesday is my day without study. I will normally do one unit Wednesday, Thursday, Friday.

Similarly, E1 set blocks of days on which she studied, to cope with the demands of her parental responsibilities while being a university student. In 2013, when E1 intended to enrol as a full-time student, she planned to "...divide up the courses and sort of do one on each day...."
In addition to these strategies, mature respondents, particularly E1 & E2, were very systematic in how they went about studying. E1 downloaded and printed all the course documents:

"I put them away and then each week I go week by week with the plan and then I take each one out that goes with whatever I'm doing that week."

E2 carefully followed the provided Unit Information and Learning Guide:

"it provided a study schedule as well. So following that study schedule for me is really important, that's one of the things I always have no matter what unit it is to know what's expected each and every week and what was I supposed to be looking at."

Evidence for this systematic approach is in E2's response to questions about assignment 1, for which she received 5 out of 5:

"it was a tick in the box. Did you do this, this, this and this and as long as you knew what you had to do, which was I liked about this unit was you knew exactly what you had to provide to get the marks. So ... if you didn't get 5 out of 5 I kind of looked and went well how did you not manage it... they told you what your 5 marks were."

As a younger student, T2 coped with study demands by prioritizing tasks and activities in a list and sorting them according to deadlines:

"I would usually create a list and sort of put it in an order as in rank them which is most, I had to complete, you know required more work or needs to be done more quicker and then I'd go by that"

T2 used divide and conquer techniques to break things down and find key words to help understand assignment questions. On the other hand, T2 had difficulty talking about specific study patterns, being unable to describe how she would initiate a study session. She noted that this was an area she needed to work on - establishing an effective way of studying. Another area for improvement identified by T2 was in understanding and interpreting essay questions (discussed in a subsequent section).

There was less evidence that T4 planned her study well. She downloaded the readings and tried "to read as much as...[she could]". However, at the end of a study session T4 undertakes a revision strategy, stating:

"I normally just read through the stuff that I've written down and then try and understand it."

While T4 chose to study T100 externally 'to try it out', she found it harder than studying internally, because she missed out on that human contact:

"I found it a lot harder ... 'cause as an internal you've got ... the tutorials where you can ask questions and all that. While external it's more on your own and you have to read the book which I find a bit boring."

The two students enrolled in E100 found the workload challenging. E2 felt that she did more hours for E100 than for other courses, because she sometimes got sidetracked searching for information on the internet, and because of the engaging nature of the tasks required:

"when we got to the time when we were all creating our own website ... I'm a bit of a perfectionist so things had to be just right and you sit there and you play for hours finding things, getting just the right picture, making sure you reference it etc."

E1 felt that the assignments "all took quite a lot of work".
"cause the website ... was quite a lot of work because ..., nothing ever finished, it was all ongoing."
"you had a deadline but you're going in doing bits to your website ... it was hard with the Wiki – [it] was quite a tricky one I thought"

However, she felt this was worthwhile:
"I mean that was good 'cause it was just something you had to have a look at and learn"

E1 enjoyed the course she was studying and felt it was valuable for her future profession:
"Yeah definitely 'cause just making a website and I know what a website, a Wiki I know what those things are and I went on, I'm not a Facebook person but I went on and had a look at those things and there was heaps of stuff that you could, so that I would know about these things for students. Definitely really helpful otherwise I'd probably without a bit of a push you might avoid sort of just looking at those things yourself.

5.4. Expectations and achievement

Table 4 indicates that all students were relatively successful. T2 and E1 obtained credit grades, T1, T3 & T4 obtained distinctions, and E2 achieved a high-distinction.

Student expectations of success and motivation were interrogated through two survey questions:

- How well do you think you will do at university? (with responses 'It'll be easy', 'I'll be OK', 'I'll have some problems', 'I think I'll struggle')
- How motivated are you about university? (with responses 'I really want to succeed'; 'I'll try hard but not at the expense of other activities'; 'I'll take it as it comes'; 'I really don't care')

Four of the respondents (T1, T2, T3, E2) responded with "I'll be OK" and "I really want to succeed". T4 was also committed to succeed, but felt she might struggle. E1, on the other hand felt that she would do OK, and she would try to succeed, but not at the expense of other activities.

The expectations and achievement of each case study student are drawn together with a summary of their overall study behaviour in the Discussion section.
6. Survey data

While the survey described in Section 3.1 and listed an Appendix A was developed specifically to identify students with different characteristics, the survey data could also be used to identify trends and correlations across the student population of each case study course. As shown in Table 1, in total, there were 149 survey responses: 125 for E100 and 24 for T100, with response rates of 43% and 34% respectively. The average age of the survey respondents was 26. Descriptive statistics are discussed further in Section 6.1, while inferential statistics are discussed in Section 6.2.

As noted earlier, some small changes were made to the wording of some questions in the survey administered to the T100 students, particularly those questions related to the use of time during the week. While care needs to be exercised in interpreting responses to these questions across the two cases, any influence is expected to be small.

6.1. Descriptive Statistics

Tables 5 - 9 summarise relevant descriptive statistics derived from the survey of students. In each table cell, the number of responses is followed by the percentage of the total.

As shown in Table 5, there were 135 females and 14 males within the survey respondents, and 113 respondents indicated that they were studying full time, with 34 reporting part-time study. 72% of respondents studied internally (on campus), while 28% were external (distance education) students. Of the internal students, 76 were enrolled at the main campus, while 31 were enrolled at the smaller, regional campus.

Table 5. Descriptive statistics for dichotomous demographic variables.

<table>
<thead>
<tr>
<th>Gender</th>
<th>Female</th>
<th>Male</th>
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</thead>
<tbody>
<tr>
<td>Enrolment load</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full-time</td>
<td>135</td>
<td>14</td>
<td>149</td>
</tr>
<tr>
<td>Part-time</td>
<td>90.6%</td>
<td>9.4%</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>113</td>
<td>34</td>
<td>147</td>
</tr>
<tr>
<td>Enrolment mode</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>On Campus</td>
<td>107</td>
<td>42</td>
<td>149</td>
</tr>
<tr>
<td>External</td>
<td>71.8%</td>
<td>28.2%</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>76</td>
<td>31</td>
<td>107</td>
</tr>
<tr>
<td>Campus attendance</td>
<td>76</td>
<td>31</td>
<td>107</td>
</tr>
<tr>
<td>Murdoch</td>
<td>71.0%</td>
<td>29.0%</td>
<td></td>
</tr>
<tr>
<td>Regional</td>
<td>71.0%</td>
<td>29.0%</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td></td>
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</table>

Table 6 summarises results related to age, socioeconomic status, and the final grade in the course. It also summarises overall responses to the intrinsic learning factors discussed in Section 5.4: Perceived Performance and Motivation to Succeed.

To facilitate this summary, the 'year of birth' continuous variable was converted to an age 'grouping' variable, where respondents were divided into four discrete age-based...

\footnotetext{Independent analysis was conducted between the two groups of responses for the various "time based" variables, and there was no appreciable difference between the mean or standard deviation of the groups that would not be otherwise accounted for. Similarly, the version of survey was not significantly correlated with the time based items. Therefore it seems clear that any impact on the responses that could be attributed to the wording change between survey versions is minimal.}
cohorts (19 or younger, 20-25, 26-38, and 39 or older. The age of respondents was split relatively equally across respondents, with 64% under the age of 25. The population is a mix of school leavers, young people starting university late, and mature-aged students.

Socioeconomic status (SES) was assessed through two measures derived from the home address and provided by the Australian Bureau of Statistics. These measures are the National and State-based SES, respectively. The majority of students lived in medium socioeconomic status areas, according to both measures.

The actual grade distribution of students is also summarised in Table 6, with peak performance around the ‘credit’ grade (60-70%). In terms of the self perceived performance and motivation data, a majority of students (62%) expected that they would be ‘OK’ in the course, with another 30% expecting they would experience some difficulties. On the other hand 77% expressed a strong desire to succeed. A further 14% would try as hard as their lifestyle would allow, while 9% were less concerned about succeeding.

Table 6. Descriptive statistics for selected demographic variables

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<thead>
<tr>
<th>Age group</th>
<th>39 or older</th>
<th>26-38</th>
<th>20-25</th>
<th>19 or younger</th>
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<td>29</td>
<td>26</td>
<td>50</td>
<td>44</td>
<td>149</td>
</tr>
<tr>
<td></td>
<td>19.5%</td>
<td>17.4%</td>
<td>33.6%</td>
<td>29.5%</td>
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<table>
<thead>
<tr>
<th>SES</th>
<th>Low</th>
<th>Medium</th>
<th>High</th>
<th>N</th>
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<td>31</td>
<td>75</td>
<td>11</td>
<td>117</td>
</tr>
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<td></td>
<td>26.5%</td>
<td>64.1%</td>
<td>9.4%</td>
<td></td>
</tr>
<tr>
<td>State SES</td>
<td>31</td>
<td>73</td>
<td>13</td>
<td>117</td>
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<tr>
<td></td>
<td>26.5%</td>
<td>62.4%</td>
<td>11.1%</td>
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<table>
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<th>Grade</th>
<th>Fail</th>
<th>Pass</th>
<th>Credit</th>
<th>Distinction</th>
<th>High Distinction</th>
<th>N</th>
</tr>
</thead>
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<td></td>
<td>7</td>
<td>11.6%</td>
<td>44.9%</td>
<td>29.9%</td>
<td>8.8%</td>
<td>147</td>
</tr>
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<td></td>
<td>4.8%</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Perceived performance</th>
<th>I'll be easy</th>
<th>I'll be OK</th>
<th>I'll have some problems</th>
<th>I think I'll struggle</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>4</td>
<td>82</td>
<td>40</td>
<td>6</td>
<td>132</td>
</tr>
<tr>
<td></td>
<td>3.0%</td>
<td>62.1%</td>
<td>30.3%</td>
<td>4.5%</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Motivation</th>
<th>I really want to succeed</th>
<th>I'll try hard but not at the expense of other activities</th>
<th>I'll take it as it comes</th>
<th>I really don't care</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>102</td>
<td>19</td>
<td>12</td>
<td>0</td>
<td>133</td>
</tr>
<tr>
<td></td>
<td>76.7%</td>
<td>14.3%</td>
<td>9.0%</td>
<td>0%</td>
<td></td>
</tr>
</tbody>
</table>

Table 7 summarises the pathways and level of performance by which students entered the university. The Australian Tertiary Admission Rank ranks secondary school graduation performance in deciles, and entrance into particular courses is determined by the so-called ATAR score. In Table 7, 63% of students did not enter through the ATAR system, but rather through various alternative entry schemes, such as 'recognition of prior learning'. This is consistent with the 70% of students who are not school leavers, shown in Table 6. The 37% with ATAR scores clustered at the lower end of the score range. This is consistent with the characteristics of students enrolled in education degrees and who enroll in 'study skills' units.

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This study set out to investigate students at risk of dropping out or failing university. One factor which is known to influence this risk is the parents' previous level of education. Students who are the first in their family to attend university are known to have lower retention and success rates than those who have parents who attended university. Table 8 summarises student responses about their parents' level of education. While a range of education levels is apparent, only 21% of fathers and 29% of mothers had graduated from a university, so the majority of respondents to this survey could be classified as 'first in family'.

The survey also set out to enquire how students spent their time each week, with questions inquiring about various aspects of study time, family responsibilities and leisure activities. Table 9 summarises student responses in these categories.

There is considerable divergence in the time spent by students engaging in various learning and other activities. The majority of students reported that they spent 6 hours or more engaging in online activities, and a significant number of students spent considerable time preparing for class activities. Also indicated in the table is the time respondents spent on non-academic endeavours such as working and socializing.

While 24% of respondents reported not working, over 26% worked more than 20 hours a week. A similar, bimodal trend is apparent in the time spent on 'caring' for others, with 35% of respondents spending no time on caring, and 30% spending more than 30 hours a week on this activity. These findings may be related to the wide range of ages in the case study units. This is explored further in the discussion of inferential statistics in the following section.

Table 7. Summary of Australian Tertiary Admission Rank (ATAR) results.

<table>
<thead>
<tr>
<th>ATAR</th>
<th>51 - 60</th>
<th>61 - 70</th>
<th>71 - 80</th>
<th>81 - 90</th>
<th>91 - 100</th>
<th>Alternative entry</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>12</td>
<td>22</td>
<td>11</td>
<td>3</td>
<td>3</td>
<td>87</td>
<td>138</td>
</tr>
<tr>
<td></td>
<td>8.7%</td>
<td>15.9%</td>
<td>8.0%</td>
<td>2.2%</td>
<td>2.2%</td>
<td>63.0%</td>
<td></td>
</tr>
</tbody>
</table>

Table 8. Summary of parents' educational level for survey respondents.

<table>
<thead>
<tr>
<th>Parents' educational level</th>
<th>Father</th>
<th>Mother</th>
</tr>
</thead>
<tbody>
<tr>
<td>No school</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>0.8%</td>
<td>0.8%</td>
</tr>
<tr>
<td>Primary school only</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>2.4%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Some or all of secondary school</td>
<td>55</td>
<td>43</td>
</tr>
<tr>
<td></td>
<td>43.3%</td>
<td>33.3%</td>
</tr>
<tr>
<td>Vocational certificate or diploma</td>
<td>35</td>
<td>44</td>
</tr>
<tr>
<td></td>
<td>27.6%</td>
<td>34.1%</td>
</tr>
<tr>
<td>Undergraduate university degree or diploma</td>
<td>18</td>
<td>21</td>
</tr>
<tr>
<td></td>
<td>14.2%</td>
<td>16.3%</td>
</tr>
<tr>
<td>Postgraduate university degree or diploma</td>
<td>9</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>7.1%</td>
<td>11.6%</td>
</tr>
<tr>
<td>Not sure</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>4.7%</td>
<td>3.9%</td>
</tr>
<tr>
<td>Total</td>
<td>127</td>
<td>129</td>
</tr>
</tbody>
</table>

The survey also set out to enquire how students spent their time each week, with questions inquiring about various aspects of study time, family responsibilities and leisure activities. Table 9 summarises student responses in these categories.

There is considerable divergence in the time spent by students engaging in various learning and other activities. The majority of students reported that they spent 6 hours or more engaging in online activities, and a significant number of students spent considerable time preparing for class activities. Also indicated in the table is the time respondents spent on non-academic endeavours such as working and socializing.

While 24% of respondents reported not working, over 26% worked more than 20 hours a week. A similar, bimodal trend is apparent in the time spent on 'caring' for others, with 35% of respondents spending no time on caring, and 30% spending more than 30 hours a week on this activity. These findings may be related to the wide range of ages in the case study units. This is explored further in the discussion of inferential statistics in the following section.

Table 9. Summary of hours spent per week in various activities.

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<table>
<thead>
<tr>
<th>Hours</th>
<th>0</th>
<th>1 to 5</th>
<th>6 to 10</th>
<th>11 to 15</th>
<th>16 to 20</th>
<th>21 to 25</th>
<th>26 to 30</th>
<th>Over 30</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preparing for class</td>
<td>0.0%</td>
<td>27.0%</td>
<td>38.0%</td>
<td>24.0%</td>
<td>17.0%</td>
<td>10.0%</td>
<td>8.0%</td>
<td>11.0%</td>
<td>135</td>
</tr>
<tr>
<td>On campus</td>
<td>0.0%</td>
<td>17.0%</td>
<td>20.0%</td>
<td>30.0%</td>
<td>29.0%</td>
<td>6.0%</td>
<td>2.0%</td>
<td>1.0%</td>
<td>109</td>
</tr>
<tr>
<td>In class</td>
<td>0.0%</td>
<td>21.0%</td>
<td>39.0%</td>
<td>38.0%</td>
<td>6.0%</td>
<td>1.0%</td>
<td>7.0%</td>
<td>6.0%</td>
<td>138</td>
</tr>
<tr>
<td>Online</td>
<td>0.0%</td>
<td>28.0%</td>
<td>39.0%</td>
<td>24.0%</td>
<td>21.0%</td>
<td>13.0%</td>
<td>7.0%</td>
<td>6.0%</td>
<td>74</td>
</tr>
<tr>
<td>Participating in group activities</td>
<td>0.0%</td>
<td>51.0%</td>
<td>13.0%</td>
<td>8.0%</td>
<td>1.0%</td>
<td>1.0%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>74</td>
</tr>
<tr>
<td>Working</td>
<td>30.0%</td>
<td>6.0%</td>
<td>20.0%</td>
<td>20.0%</td>
<td>14.0%</td>
<td>9.0%</td>
<td>8.0%</td>
<td>16.0%</td>
<td>123</td>
</tr>
<tr>
<td>Providing care</td>
<td>41.0%</td>
<td>22.0%</td>
<td>8.0%</td>
<td>3.0%</td>
<td>3.0%</td>
<td>3.0%</td>
<td>36.0%</td>
<td>30.0%</td>
<td>119</td>
</tr>
<tr>
<td>Managing personal business</td>
<td>10.0%</td>
<td>28.0%</td>
<td>36.0%</td>
<td>32.0%</td>
<td>8.0%</td>
<td>4.0%</td>
<td>3.0%</td>
<td>8.0%</td>
<td>129</td>
</tr>
<tr>
<td>Relaxing and socializing</td>
<td>2.0%</td>
<td>44.0%</td>
<td>38.0%</td>
<td>25.0%</td>
<td>13.0%</td>
<td>3.0%</td>
<td>3.0%</td>
<td>4.0%</td>
<td>132</td>
</tr>
</tbody>
</table>

*Students with external enrolments had the option to skip this question.*

### 6.2. Inferential statistics

Analysis of the overall survey data was carried out to investigate the effect of selected variables on student success. In this study, success was represented by the student's final mark in the course. This 'success' variable was expressed in two forms: 'Total' (numeric score out of 100) and 'Result' a 1-5 grading of the % score in 'Total'. This approach was taken to double check for internal variation within the data set, and to allow for the use of different statistical techniques.

The hypotheses investigated were:

1. Demographic variables (SES status, parents' level of education, age and university entrance scores [Australian Tertiary Admission Rank - ATAR]) may be related to success.
2. Time spent in preparation, engagement (LMS and Lectopia frequency) and online may be related to success.
3. Hours preparing and hours studying may be related to success.
4. Hours spent on other activities (work, caring...) may be negatively related to success (especially if there is a full-time enrolment).
5. Intrinsic learning factors ('self-perceived performance' and 'motivation to succeed') may be related to success.
6. Face-to-face attendance and Lectopia use may be related to success for internal study mode students.
7. Online activity may be related to success for external study mode students.
Pearson correlation coefficients were calculated between the 'Total' and 'Result' success variables and the range of variables identified in the hypotheses.

In the tables that follow the relationship between the various study variables and the outcome variables of 'success' are explored in the order that the hypothesis are presented above. There is an independent table for each of the relevant hypotheses. In each case '*' indicates that the correlation is significant at the 0.05 level (2-tailed) and '**' indicates that the correlation is significant at the 0.01 level (2-tailed).

6.2.1. Hypothesis 1: Relationship of demographic variables with student success

Based on previous research, it was hypothesised that success could be predicted by high SES status, parents who had previously attended university, and high university entrance scores (Australian Tertiary Admission Rank - ATAR). On the other hand, we predicted that older students would have lower success than younger students. The relevant correlations are presented in Table 10 and discussed below.

Table 10. Correlations of the 'result' and 'total' success variables against selected demographic variables.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Result</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>National SES</td>
<td>-.142</td>
<td>-.176</td>
</tr>
<tr>
<td>State SES</td>
<td>-.159</td>
<td>-.191*</td>
</tr>
<tr>
<td>Father's educational level</td>
<td>.068</td>
<td>.062</td>
</tr>
<tr>
<td>Mother's educational level</td>
<td>.048</td>
<td>.061</td>
</tr>
<tr>
<td>Year of birth</td>
<td>-.304**</td>
<td>-.288**</td>
</tr>
<tr>
<td>Age group</td>
<td>-.339**</td>
<td>-.320**</td>
</tr>
<tr>
<td>ATAR</td>
<td>.359*</td>
<td>.343*</td>
</tr>
</tbody>
</table>

a) Success vs SES status

Two measures of socioeconomic status were used within the study. The first was based on national data, the second was based on state data. There was no substantive correlation between SES and success. While a significant correlation was reported between the state-based SES variable and Total, this relationship was not consistent with the Result measure of success, nor with the national measure of SES.

b) Success vs Parents' level of education

While there was a significant relationship between the educational level of the students' parents with each other (i.e., mother with father at the p<0.01 level), there was no significant correlation between these variables and either of the measures of success. In other words, a student's status as belonging to the first generation in a family to attend university did not impact on their success in the units studied.

c. Success vs age

As with the two measures of success, two measures of age were utilised during the analysis. The first was 'year of birth'; and the second was the age grouping variable defined in §6.1 and Table 6.

There was a significant effect of age across the success measures, with older students performing better than younger students, with the correlation significant at the p<= 0.01 level. This was the variable which accounted for the majority of the variation in the data set, including much of the variety in hours spent doing tasks, motivation, and performance.
d. Success and ATAR

The other variable which did significantly predict success was (not unexpectedly) the student ATAR (0.359, significant at the \( p<=0.05 \) level). This influence needs to be treated with caution, however, as only 51 of the 138 respondents had a reported ATAR. The majority of the respondents gained entry through 'alternative pathways', as discussed in §6.1.

6.2.2  Hypothesis 2: Relationship of online variables with student success

The correlations for variables related to online study are presented in Table 11. The expectation was that a higher level of online engagement would contribute to success. A single variable for 'online engagement' was created as a combination of LMS use and Lectopia use. This variable was created in addition to the individually reported use of the LMS and Lectopia.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Result</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hours using online technologies</td>
<td>.216*</td>
<td>.210*</td>
</tr>
<tr>
<td>Online Engagement #</td>
<td>-.241**</td>
<td>-.255**</td>
</tr>
<tr>
<td>LMS Use#</td>
<td>-.372**</td>
<td>-.366**</td>
</tr>
<tr>
<td>Lectopia use #</td>
<td>-.103</td>
<td>-.124</td>
</tr>
</tbody>
</table>

*the negative correlation here is a result of the coding of higher use being a lower number 1=Daily; 3=Weekly, etc.

There was a significant correlation between high levels of LMS and Lectopia use (combined) and LMS use with results and total. Students who reported high usage of both the LMS and Lectopia (together) performed significantly better than those who did not report such usage. Lectopia usage on its own did not produce this change in results, while use of the LMS did. This is consistent with the observation in §3.3.1 that cotent delivery had relatively low importance in both of the case study units.

6.2.3  Hypothesis 3: Relationship of study hours with student success

The correlations for preparation time and total study hours are presented in Table 12. The 'Hours using online technologies' variable from Table 11 is also relevant to this hypothesis.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Result</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hours preparing for class</td>
<td>.073</td>
<td>.086</td>
</tr>
<tr>
<td>Total study hours</td>
<td>.225*</td>
<td>.215*</td>
</tr>
</tbody>
</table>

The variables of time online and class preparation were strongly correlated with each other. Both the 'time online' and 'total study hours' variables were positively correlated with success (\( p<=0.05 \) level). On the other hand, 'hours preparing for class' was not related to success. This could be because class attendance had less importance in a blended learning course, and class attendance was not relevant for the ~30% of external student respondents. It could also reflect the fact that the courses were not formally structured into weekly segments that required, for example, specific readings to be completed before each lecture.
6.2.4. **Hypothesis 4: Relationship of other responsibilities with student success**

Hypothesis 4 predicted a negative relationship between the use of time on non-study activities and success, based on the premise that students with other commitments will have fewer hours available to study, and therefore would perform less well. The relevant correlations are shown in Table 13.

**Table 13. Hypothesis 4: Relationship of other responsibilities with student success.**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Result</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total home duties</td>
<td>.212*</td>
<td>.221*</td>
</tr>
<tr>
<td>Total hours self</td>
<td>-.128</td>
<td>-.082</td>
</tr>
<tr>
<td>Hours working</td>
<td>.114</td>
<td>.037</td>
</tr>
</tbody>
</table>

Despite the hypothesis, the data showed that there was no negative relationship between time spent on other activities and success. In fact, there was a slight positive relationship between success and hours spent on home duties. This was the same in both the general sample group, and for those enrolled full-time.

As with the relationship between success and caring activities, ‘total study hours’ (Table 12) and ‘total home duties’ both had a positive relationship with success. The number of hours working had no impact on either measure of success. While our hypotheses predicted that ‘total study hours’ would lead to success, it was unexpected that ‘total home duties’ would correlate positively with success.

These marginally positive relationships were eliminated when age was factored in (see Table 14). The older respondents completed significantly more study hours and more hours of ‘home duties’ than did their younger counterparts. Similarly the older respondents reported working more hours in paid employment. Each of these relationships was significant at the P<0.01 level.

**Table 14: Correlations of age with hours spent in various activities.**

<table>
<thead>
<tr>
<th>Age group</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Total study hours</td>
<td>-.327**</td>
</tr>
<tr>
<td>Total home duties</td>
<td>-.700**</td>
</tr>
<tr>
<td>Total hours self</td>
<td>.107</td>
</tr>
<tr>
<td>Hours working</td>
<td>-.346**</td>
</tr>
</tbody>
</table>

6.2.5. **Hypothesis 5: Relationship of intrinsic learning factors with student success**

Hypothesis 5 investigated the two intrinsic learning factors introduced in Section 5.4. As can be seen in Table 15, self-perceived performance was correlated to success, with students having a reasonably good ability to predict their future performance. Motivation was less strongly (but also significantly) related to one of the success variables.

**Table 15. Hypothesis 5: Relationship of intrinsic learning factors with student success.**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Result</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceived performance</td>
<td>-.255**</td>
<td>-.310**</td>
</tr>
<tr>
<td>Motivation</td>
<td>-.221*</td>
<td>-.140</td>
</tr>
</tbody>
</table>
6.2.6. **Hypothesis 6: Relationship of Lectopia use and lecture attendance with student success**

We predicted that self-reported lecture attendance and Lectopia use would both positively influence success.

When these correlations were calculated (Table 16), we observed that neither lecture attendance nor Lectopia use correlated with success.

<table>
<thead>
<tr>
<th>Table 16. Hypothesis 6: Relationship of Lectopia use and lecture attendance with student success (Internal students only).</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecture attendance</td>
</tr>
<tr>
<td>-------------------</td>
</tr>
<tr>
<td>Lectopia use</td>
</tr>
</tbody>
</table>

When Lectopia use was compared with Lecture attendance for internal students, a correlation of -0.313 was calculated (significant at the P<=0.01 level). One interpretation of this finding is that internal students are seeing the Lectopia recordings as alternatives to the face-to-face lectures.

6.2.7. **Hypothesis 7: Performance of internal and external students**

Given that internal students studied in blended mode, with access to face-to-face support mechanisms, we expected that online activity may be related to success for external study mode students, as the external students had no access to other face-to-face resources that might have confounded this variable.

External students performed slightly better against the Total success measure than students who were enrolled on campus (Table 17). However, the difference was not significant.

<table>
<thead>
<tr>
<th>Table 17. Comparison of performance for internal and external students, using the Total success measure.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
</tr>
<tr>
<td>-------</td>
</tr>
<tr>
<td>Internal</td>
</tr>
<tr>
<td>External</td>
</tr>
</tbody>
</table>

In Table 18, we compared the performance of internal and external students against the online engagement variables used in Section 6.2.2.

<table>
<thead>
<tr>
<th>Table 18: Comparison of the impact of online engagement on success for internal and external students.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal</td>
</tr>
<tr>
<td>----------</td>
</tr>
<tr>
<td>Online Engagement</td>
</tr>
<tr>
<td>LMS Use</td>
</tr>
<tr>
<td>Lectopia use</td>
</tr>
</tbody>
</table>

Table 18 shows that, for external students, there is no correlation between success and Lectopia use, or the combination use of LMS and Lectopia for external students. LMS use accounted for a slightly significant correlation for one of the two success variables. On
the other hand, there was a significant correlation between LMS use and success for internal students.

7. Discussion

The descriptive and inferential statistics paint a picture of a diverse student cohort, which has some common characteristics.

Despite the large proportion of students with low-medium socioeconomic status and those who were 'first in family' to attend university, there was no correlation between success and SES status or parents' educational level. However, there was a strong correlation between success and age – older students performed better, and this was opposite to our prediction. For the minority of students who were eligible for an Australian Tertiary Admissions Rank, a higher ATAR score correlated with success.

The correlational analysis showed that lecture attendance and Lectopia use was relatively unimportant in the case study units (Hypothesis 2 & 6). This was not unexpected, because both unit designs used lectures for providing rationales and 'scene setting' rather than content delivery (see Section 3.3.1).

However, students who reported high levels of online engagement performed significantly better than those who did not report such usage (Hypothesis 2). When these results were broken down by enrolment mode (Hypothesis 7), it became apparent that online engagement was significant for internal students, but not for external students. A possibility exists that the addition of the online facilities to the face-to-face learning might provide a multiplying effect. Similarly, the notion that all learning in the external environment is closely related to online learning may have confounded the relationships between underlying ability and results. Many external students prefer to work alone, as discussed in §5.3. Further investigation is required here.

Not surprisingly, there was a strong relationship between students' self-perceived performance and success, and a weaker relationship between motivation and success.

In terms of the hours spent each week on various activities, 'total study hours' and 'hours online' were positively correlated with success (Hypotheses 2 & 3). The number of hours working had no impact on either measure of success. On the other hand, a counterintuitive finding was that 'total home duties' had a positive relationship with success (Hypothesis 4).

However, these slightly positive relationships were eliminated when age was factored in. Older students worked longer, were found to perform better, and were also more likely to be spending time caring for others. Thus, it is conceptually more likely that both of these features are a function of age rather than interdependent.

The overwhelming factor arising from the inferential statistics was that older students were more successful than younger students. They were better able to manage their time and the competing priorities in their lives. These factors also stand out when summarising the characteristics of the six students who were interviewed and whose survey responses were also studied in depth. These are described in detail below.
7.1. Student T1

T1 was a conscientious student with a passion for Theology. She felt she would “do OK” at university and appeared to be highly motivated – in her words “over diligent”. After many years away from study, T1 had some challenges adapting to a technology-enhanced university environment, but was able successfully to overcome these.

T1 received a 72% distinction for the course. She said that it took her a while to get the hang of writing essays and doing it in the manner requested, as it was different to what she was used to in the United States. T1 scored only 62 percent in the second essay, weighted at 25% of the total assessment for the course. She felt that teaching staff were a little rigid with what they expected from essays.

T1 was the first in her family to go to university, with parents who were a tradesman and a dressmaker. Two of T1’s cousins and siblings had gone to university. She felt isolated from her family, commenting:

“I’ve always been the odd one out ... I don’t think the same way as my family.”

T1 was planning to continue her studies as an internal student, with a move to the city, and felt that the on-campus environment would suit her better. She said that it was a long rigorous process and she was beginning courses in 2013, that are part of the requirement for church ordination:

“Which is even more reading... I think I’m very socially conscious I guess you could say. And very interested in advocacy and the rights of refugees and ... the homeless and the downtrodden... I’ve always been that way it just took me a long time to get to where I am”.

7.2. Student T2

T2 was a school leaver coming to grips with the university environment. While she seemed conscientious, she didn’t appear to put in as much effort as others, and this shows in her comparatively lower mark of 63%. She also reported spending the least number of hours studying of the six interviewees. T2 was quite happy with her final result, confident that she did not received the “lowest mark in the course or close to it”.

T2 found that the ideas in T100 helped to expand her ideas and deal with conflicts that may have arisen between her religious beliefs and the ideas expressed in science:

“I would sometimes think about what if psychology comes in between my religion and it’s, because you like had to put aside your religious values and really come out in the world and accept other things and other ideas and I know it did when we talked about it helped me a lot. But not as in, not as in specifically in something, something about psychology it wasn’t that direct, but something along those lines.”

7.3. Student T3

T3 was a well-organised, single parent successfully juggling study and work commitments. T3 was very happy with her Distinction result of 74% in T100. She was pleased she was able to maintain the high results consistently scored in her initial nursing diploma studies, and that she hadn’t ‘lost’ her ability to study and achieve:

“I am happy with it. I know when I did my initial diploma in nursing I got you know all credits and distinctions and high distinctions so I probably was surprised that I was still able to do that.”
T3's parents were educated, but not at university level. T3 purposely failed high school because of conflict with her father, commenting: "I got myself a boyfriend in year 11 and that was a huge distraction". However, T3 subsequently gained a diploma in nursing and then completed a degree conversion course before resuming study.

T3, who really enjoyed studying T100, appeared to be highly motivated to complete the course. She suggested that the course was useful for her overall university studies:

"Look I thought it was very good.... It was aimed at ... how to read something, how to ... read and note take, how to write a reading report, how to paraphrase, how to do a lecture report and how to write an essay and all that sort of stuff. So in the end it all sort of linked together, but no it was extremely helpful."

At the point of being interviewed, T3 was seeking to change careers. She showed a mature approach to managing her time and study commitments. Nevertheless, T3 expressed concern about attaining work-life balance as a single mother working full time while studying part time.

**7.4. Student T4**

T4 was a conscientious, school leaver who was developing her study skills. Her overall mark was 70%, but T4 barely passed both essays, and made up marks through the learning journal and the exam.

T4 appreciated the 'learning log' journal activity, suggesting that "...it makes you understand the readings". T4 also appreciated only having a 35% weighting for the exam, because this "didn't put too much pressure on you". However, T4 responded that she found the two essay assignments (for which she received low marks) "a bit random", and further explained:

"I don't know just talking about like social sciences and all that stuff"

She put an appropriate and successful effort into her study, including revision strategies, but was still developing the life skills of her older counterparts. There was evidence that T4 was aspiring to succeed at university, reporting studying after the end of the academic year.

Based on the survey responses, T4 felt that she would 'have some problems' at university, but had a strong motivation to succeed. In the interview, T4 commented that she was worried that she may have had trouble adjusting from high school. However, at the time of the interview, T4 felt that she had adjusted well. One factor in that adjustment was the ability to make new friends. "I've made some good friends so that's good." She also had to adjust to the workload, which is greater at university than at school.

Both T4 and her brother had attended university, although her parents had not.

**7.5. Student E1**

E1 was a conscientious, strategic student who had a mature attitude to study. E1 was happy with her final result of 65% and appeared motivated to continue her studies. Despite responding in the survey that she felt she would be OK at university, the interview exposed some trepidation about external study that was quickly discounted:

"...because I wondered how it would [work] externally and I thought maybe I'd feel a bit out of it but I don't at all because it just feels, with everything online and the lectures I don't feel like I'm missing out on anything."
E1 was pleased with all of her university courses and enjoyed academic work. She found that her university tutors were easily contactable. In particular, E1 found that university assignments, such as making a website were very useful for developing her skills with technology. Analysis of E1’s mark distribution over the various assessment types revealed that she performed more poorly in the exam (11.5/20) than in the assignments, which all averaged around 65%.

While E1 wanted to attend university when she “was about 15”, by the time she left school she “never wanted to go to uni[versity] really”. For many years E1 didn’t consider university study:

“until now I thought well you’re probably too old or ... I just didn’t think it was possible after that.”

E1 balanced the effort she put into study against her family responsibilities, and this may have led to a grade which was lower than might be expected for such a conscientious student. When considering the pressures of her family circumstances, which involved child rearing, E1 was particularly pleased with her academic results:

“...it’s like over the exam time or when an assignment’s due you can guarantee one of the kids will be sick all week. ... I think when I see my mark I mean I’m really happy with it anyway but I know I’m really happy with it ‘cause of the circumstances, all the family stuff I’ve had at the same time....”

Despite not being physically present on campus, as an external student, E1 was enjoying technology-enhanced university study, and she was the student, of those interviewed, who contributed most to discussion forums.

“you can just get in touch with your tutors... so easily. I’m just happy just to get on with the work really and yeah I really like the work, I find all the units really good.”

7.6. Student E2

Despite having a very busy lifestyle, E2 was a mature student committed to success. In the survey, E2 stated that she expected to ‘do OK’ in E100, and she was prepared to ‘try hard’ to succeed. Her final mark was 80%, and she was happy with that. “I’m pretty over the moon actually”. E2 further commented about her academic results:

“They’re pretty good actually. I run a really busy life here and I think that’s a fair and reasonable mark for the work that I put in. Some weeks are busier than others and I kind of think if overall, over a 15 week period if I can come out with marks around the 70’s to 80, I think ... that’s a fair and reasonable mark.”

Neither of E2’s parents attended university, and they didn’t value it. After leaving school, E2 was unaware of how to apply for university entry:

“... being the first and oldest ... child my parents didn’t know how to support university. ...So the result was I didn’t apply for an entrance into university and therefore didn’t go on and chase that for some time actually.”

For many years, E2 did not consider university an option, and, when she commenced her studies, she was concerned that she would struggle at university. Her high distinction mark demonstrated the fallacy of these concerns. E2’s husband was studying a second Master’s degree and her younger brother attended university. E2 appears currently to be living in a context where university attendance is a normal activity.
She was a very systematic, self-motivated student who did not need the support of others to succeed. E2 viewed herself as succeeding at university, despite some early reservations about her abilities as a mature-aged entrant:

“When I first started university I was a bit nervous that I might not be academically inclined enough or anything like that but I think my marks have shown that actually you know what, I’m not a bad egg at this.”

The following quote illustrates E2’s mature approach to ‘success’ in the context of her life:

“I don’t beat myself up if I don’t get a high distinction either because I kind of figure that it’s not all about the marks, it’s how you apply yourself and how much you’re willing to learn and be practical in the field as well.”

8. Conclusion

Despite some setbacks, the broad outcomes of this research project were achieved. We produced rich, qualitative descriptions of how some students behaved in some contexts. Both the in-depth analysis of the six students and the aggregated survey results point to certain characteristics which are likely to lead to success in courses like the ones investigated here. Recognition of these characteristics, and their continuing development, is likely to be of benefit to ‘first in family’ students and those entering university from diverse backgrounds.

The inferential statistics pointed strongly to the role of maturity in successful completion of courses like the two studied here. Age had a much stronger impact than the use of technology. Despite their different work and life contexts, the six respondents reported relatively similar ‘recipes’ for success.

Planning, scheduling and prioritising were important strategies identified by the interviewed students, particularly the more mature ones. Students who spent more hours per week in both studying and caring were more successful than those who put in less time.

Successful students exhibited a strong work ethic. They read all the information available and followed the course outline, finding that much of the information they needed to succeed was clearly presented. They also focused on the tasks set each week in their courses.

A factor which has not been investigated here is the effect of gender. The gender balance in this study was approximately 90% female, and all six interviewees were female. It is perhaps fairly common for women in society to adopt caring roles in families, for both children and elderly parents, and this may be reflected in these results. The research could usefully be repeated in contexts with greater gender balance to investigate this effect further, as few conclusions in this regard can be drawn from the current study.

Successful students set aside particular times and places for their study, for example, allocating one day a week for each course. Having a suitable, and quiet study space was also important for all six respondents.

Some students became deeply engaged with the tasks they carried out. Their intrinsic motivation led them to immerse themselves in learning activities. While motivation is a complex and under-researched area, it seems clear that course design, and particularly the tasks that students complete within a course, will influence the engagement of students in a course. The authentic learning approach taken in E100 is likely to have
engaged students more than a traditional learning design. Similarly, the immediate practical relevance of the activities in T100 seem to have engaged students.

All respondents used a range of technologies for their study. LMS use was relatively heavy across the respondents, while Lectopia use was not heavily reported. With their emphasis on student-centred activities, formal lectures formed a relatively small component of the overall learning environment for both case study courses, so it is understandable that Lectopia use was relatively low.

While the course designs were quite innovative, one aspect of both could be further developed and improved to align more substantially with blended learning best practice (Littlejohn & Pegler, 2007). That is, to increase the amount of social learning taking place. There was a tendency for students to work individually, with students tending to simply read discussion posts and not to respond to them. A revised learning environment with tasks that encourage meaningful dialogue between students might lead to more social construction of knowledge among students.

Finally, let us return to the overarching research question “In what ways do students in different studying contexts interact with blended-learning designs in their first year of university?”

The students in this study came from diverse backgrounds, and approached their study in diverse ways. In the two units studied here (with their specific, similar characteristics), ‘at-risk’ characteristics, such as ‘first in family’ and low socioeconomic background seemed to have no impact on student success. Similarly, technology use seemed to have little impact. The factors which were most important were organisational skills and work ethic, and these were found to strongly correlate to maturity.

9. References


Appendix A: Final survey used to identify students with different characteristics

2012 Echo360 grant selection survey

Introduction
We are investigating how you study in <unit>. This brief survey asks about how you study at university, how you use educational technology, and about your university life in general. It is part of a larger study looking at how new students engage with the university environment and how they use educational technology to successfully study at university. We know that different students use very different approaches, and we will use the results of this survey to select particular students and invite them to an interview about their study behaviours.

Your lecturers and tutors will not be involved in the research during the semester, and your participation in the research will have no impact on your performance in this unit. To save you time in filling out this survey, we will access some of the information we need from your MyInfo data.

While we will value your responses, you can choose not to answer this survey, and then you will not take part in any other aspect of this study.

Living and travel arrangements
Which of the following describes your current living arrangement? Select the option that best applies to you.
- On campus in a university college or hall of residence
- Off campus student accommodation
- Living with friends or in a share house
- Living with parents or guardians
- Living by yourself
- Living with a partner
- Living with a partner and children
- Single parent with children
- Other

How long does it take you to travel to university?
- 0-10 mins
- 11-30 mins
- 31-60 mins
- >60 mins
- N/A

Which mode of transport do you mostly use to get to university?
- Car
- Public transport
- Cycling or walking
- Not applicable – I am an external student
- Other

How often do you study during your travel time to or from campus?
- Every day
- Most days
- Infrequently
- Never

If you do use your travel time to study, what do you do? Tick as many boxes as necessary
- Listen to lecture recordings
- Reading unit/course materials on paper
- Reading unit/course materials electronically
- Interactive activities (e.g. email, discussion forums)
Study Context

What is/are your majors (e.g. accounting, primary education, psychology, law)?
[Free text]

What was your ATAR score?
51-60  61-70  71-80  81-90  91-100  alternative entry

Time use

About how many hours do you spend in a typical seven-day week doing each of the following?

Hours per week preparing for class (e.g. studying, reading, writing, doing homework or lab work, analysing data, rehearsing and other academic activities)

1 to 5 hours
6 to 10 hours
11 to 15 hours
16 to 20 hours
21 to 25 hours
26 to 30 hours
Over 30 hours
N/A

Hours per week spent on campus

1 to 5 hours
6 to 10 hours
11 to 15 hours
16 to 20 hours
21 to 25 hours
26 to 30 hours
Over 30 hours
N/A

Hours per week spent in class

1 to 5 hours
6 to 10 hours
11 to 15 hours
16 to 20 hours
21 to 25 hours
26 to 30 hours
Over 30 hours
N/A

Hours per week spent using online technologies to do university work

1 to 5 hours
6 to 10 hours
11 to 15 hours
16 to 20 hours
21 to 25 hours
26 to 30 hours
Over 30 hours
N/A

Hours per week participating in organised group activities at university or outside
(e.g. student associations, clubs and societies, sporting clubs, religious groups, etc.)

1 to 5 hours
6 to 10 hours
11 to 15 hours
16 to 20 hours
21 to 25 hours
26 to 30 hours
Over 30 hours
N/A

Hours per week earning an income

1 to 5 hours
6 to 10 hours
11 to 15 hours
16 to 20 hours
21 to 25 hours
26 to 30 hours
Over 30 hours
N/A

Hours per week providing care for dependents (e.g. parents, children, spouse, etc.)
1 to 5 hours
6 to 10 hours
11 to 15 hours
16 to 20 hours
21 to 25 hours
26 to 30 hours
Over 30 hours
N/A

Hours per week managing personal business (e.g. housework, shopping, exercise, health needs, etc.)
1 to 5 hours
6 to 10 hours
11 to 15 hours
16 to 20 hours
21 to 25 hours
26 to 30 hours
Over 30 hours
N/A

Hours per week relaxing and socialising (e.g. watching TV, partying, etc.)
1 to 5 hours
6 to 10 hours
11 to 15 hours
16 to 20 hours
21 to 25 hours
26 to 30 hours
Over 30 hours
N/A

Expectations/Success

How well do you think you will do at university?
It'll be easy
I'll be OK
I'll have some problems
I think I'll struggle

How motivated are you about university?
I really want to succeed
I'll try hard but not at the expense of other activities
I'll take it as it comes
I really don't care

Lecture attendance

What % of lectures in <unit> have you attended so far this semester?
0%
1-25%
26-50%
51-75%
76-99%
100%

Online Study

How often do you use the Learning Management System?
Daily  every couple of days  weekly  every couple of weeks  monthly  less than
How often do you use the Lectopia lecture recording system?

- Daily
- Every couple of days
- Weekly
- Every couple of weeks
- Monthly
- Less than once a month
- Never

Comments

How often do you use Facebook or other social networking systems overall?

- Daily
- Every couple of days
- Weekly
- Every couple of weeks
- Monthly
- Less than once a month
- Never

Comments

How often do you use Facebook or other social networking systems for study?

- Daily
- Every couple of days
- Weekly
- Every couple of weeks
- Monthly
- Less than once a month
- Never

Comments

List any other online technologies you use for study. E.g. YouTube, Twitter, wikis, social bookmarking

[Text box]

If there is anything special or different about how you study at university, please tell us below.

[Text box]

What is the highest level of education completed by your parents/guardians? Mark one box per row.

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<th></th>
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<th>Primary school only</th>
<th>Some or all of secondary school</th>
<th>Vocational certificate or diploma</th>
<th>Undergraduate university degree or diploma</th>
<th>Postgraduate university degree or diploma</th>
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<td>Father</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Mother</td>
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<td></td>
<td></td>
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Wrapping up

We ask the following question only because we want to understand how people with disabilities use educational technology to make their study easier. The outcomes of this research could be used to inform people with various disabilities about effective study approaches.

Do you consider yourself to have a disability, impairment or long-term condition that affects your study?

- No
- Yes
- I prefer not to answer

I consent to the research team accessing system-recorded data about my study behaviour.

- No
- Yes
Appendix B: Sample profile for student T1

Individual Case data for:

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<tr>
<td>Name</td>
<td>Sheet 3: ‘Selected Student Info’</td>
<td>T1</td>
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<tr>
<td>Email</td>
<td>Sheet 3: ‘Selected Student Info’</td>
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</tr>
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<td>Gender</td>
<td>Gender</td>
<td>F</td>
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<tr>
<td>Age</td>
<td>Age</td>
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<td>Residence status</td>
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<tr>
<td>Language</td>
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Background

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<td>Fulltime/parttime</td>
<td>Fulltime/parttime</td>
<td>Full-time</td>
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<td>Mode of transport</td>
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Hours/week spent on various activities

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<td>Hrs on campus</td>
<td>Hours_week_spent_on_campus</td>
<td>n/a</td>
</tr>
<tr>
<td>Hrs in class</td>
<td>Hours_week_spent_in_class</td>
<td>n/a</td>
</tr>
<tr>
<td>Hrs using online for uni</td>
<td>Hours_week_spent_using_online_technologies_to_do_university_work</td>
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<td>Hrs with clubs</td>
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<td>Hrs working</td>
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<td>20</td>
</tr>
<tr>
<td>Hrs caring</td>
<td>Hours_week_providing_care_for_dependents__e.g._parents___children___spouse___etc</td>
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<td>Hrs housework</td>
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### About this unit

**General features of unit**

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<td>Number/length of small group activities</td>
<td>Throughout unit</td>
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<td>Other scheduled activities</td>
<td>Journal entries</td>
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<td>Role of lectures</td>
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<td>Assessment 1</td>
<td>Log</td>
</tr>
<tr>
<td>Assessment 2</td>
<td>essay</td>
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<tr>
<td>Assessment 3</td>
<td>essay</td>
</tr>
<tr>
<td>Assessment 4</td>
<td>Tutorial online participation</td>
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<td>Assessment 5</td>
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### Technology Use

**Survey**

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<td>Lectopia use</td>
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**Logs**

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<tr>
<td># unique hits</td>
<td>uniqueHitCount</td>
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**Usage log graphs for Lectopia (E100 only)**

Take from sheets labeled by student number in the spreadsheet.

**LMS access summaries**

Locate ‘tracking report’ spreadsheet for each student in the LMS folder for that unit. Print as a separate file?

**SNAPP reports**

(where there are any)

**Facebook or other technologies**

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<td>Other_online_technology_used</td>
<td>Wikis, youtube, google</td>
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**Other_online_technology_used – freeform**

Wikis, YouTube, google

**special_different_about_study – freeform**
## Marks

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<th>Title from UILG</th>
<th>Avail marks (from unit guide)</th>
<th>Actual marks</th>
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<tr>
<td>Learning Journal</td>
<td>35%</td>
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<td>Essay 1</td>
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<td>Essay 2</td>
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<td>Exam</td>
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<td>Total</td>
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## Motivation

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<td>I'll be okay</td>
</tr>
<tr>
<td>Motivation</td>
<td>Motivation</td>
<td>I really want to succeed</td>
</tr>
</tbody>
</table>

## Study Patterns

<table>
<thead>
<tr>
<th>Variable</th>
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<th>Value</th>
</tr>
</thead>
<tbody>
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<td>Study while travelling</td>
<td>Frequency_of_travel_study_time</td>
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</tr>
<tr>
<td>Travel study activities - lectures</td>
<td>Study_travel_time_activitiesListen_to_lecture_recordings</td>
<td>•</td>
</tr>
<tr>
<td>Travel study activities - paper reading</td>
<td>Study_travel_time_activitiesReading_unit_course_materials_on_paper</td>
<td>•</td>
</tr>
<tr>
<td>Travel study activities - online reading</td>
<td>Study_travel_time_activitiesReading_unit_course_materials_electronically</td>
<td>•</td>
</tr>
<tr>
<td>Travel study activities - interactive</td>
<td>Study_travel_time_activitiesInteractive_activities_e.g_email_discussion_forums</td>
<td>•</td>
</tr>
<tr>
<td>Other study patterns</td>
<td>Special_different_about_study</td>
<td>•</td>
</tr>
</tbody>
</table>

## Family

<table>
<thead>
<tr>
<th>Variable</th>
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</tr>
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<tbody>
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<td>A_SES</td>
<td>#n/a</td>
</tr>
<tr>
<td>SES M</td>
<td>M_SES</td>
<td>#n/a</td>
</tr>
<tr>
<td>Father’s education level</td>
<td>Parents_level_of_educationFatherR1</td>
<td>Vocational certificate or diploma</td>
</tr>
<tr>
<td>Mother’s education level</td>
<td>Parents_level_of_educationMotherR1</td>
<td>Undergraduate university degree or diploma</td>
</tr>
<tr>
<td>First in family</td>
<td>Derive from 2 fields above</td>
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## Disability

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>Disability</td>
<td>Disability</td>
<td>I prefer not to say</td>
</tr>
</tbody>
</table>
Appendix C. Semi-Structured Interview Schedule

A specific document was developed for each interviewee based on their overall profile – see Appendix B.

1.0 Icebreaking, informal greetings, written informed consent, etc.

The interviewer will greet the participant, engage in informal conversation and review the process of informed consent. The participant will be reassured that they are free to refuse participation in the study and can withdraw from the study at any time, without disadvantage. The interviewer will review the aim of the research project and the proposed research activities for the participant.

Ensuring that the participant is comfortable, the interviewer will review the written documentation, such as the information letter and consent form. The interviewer will reassure the participant that the aim of the study is not to identify individual students, but to examine patterns related to students’ practices and habits related to learning and study. The participant will also be reassured that there are no ‘right’ or ‘wrong’ answers to the interview questions.

2.0 Indicative Interview Questions

Background

Interviewer confirms participant’s details: (i.e. with information sourced from the survey*, e.g. enrolment mode, fulltime/parttime, ATAR, citizenship, language, Current living arrangement, Travel time, mode of transport, Major field of education *(take from sheet 3. Full Data)

How long have you been studying at Murdoch University? (other tertiary institutions, etc.)

Confirm hours/week spent on various activities. (by showing table of ‘hours per week’ responses.)

About this unit

Do you remember how TLC120/ EDN113 was structured? [Prompt the student about the general features (framework lectures in both cases; assignments; essays, etc.). Show unit weekly schedule.]

Technology Use

The survey said that you

- attended x% of the lectures
- use the LMS [how often]
- use Lectopia [how often]

The interviewer shows:

- usage log graphs for Lectopia (EDN113 only);
- LMS access summaries and
- SNAPP reports (where there are any).

Is this information accurate? There could well be discrepancies. Explore the reasons.
The interviewer talks the participant through the data, with additional information or explanations as necessary. The focus of the conversation is placed on the wide diversity of study practices/habits, rather than assessment and 'good' or 'bad' performance (i.e. there is not necessarily a right or wrong way to approach study).

The questions generated from the usage log data will focus on better understanding how the participant approaches study in this particular unit. For example: You don't seem to have listened to Lectopia during semester, but you attended every lecture. Why did you approach your study in this manner? For example: Can you see how the graph indicates that you listened to lectopia extensively over this period? Why did you think this was the case? Example: The graph here indicates that you have been actively involved in posting questions in the online discussion forum and replying to posts? Why do you think you engaged in the online discussion forum?

Do you use Facebook or other technologies to support your study. Refer to survey responses (Facebook_use_overall, Facebook_use_for_study, Other_online_technology_used)

- EDN113 students will have lots of these, because this is the way the unit is designed. Don’t get tied up with this. Try to focus on what they use to study.

**Marks**

Here are your marks for this unit. What do you think about these? [unpack what these mean and tie them back to the assessment items. Ask about high scores and low scores.]

In the survey, you responded about how well you thought you would go at uni, and your motivation to succeed [present perceived_performance_at_uni, Motivation]. How does this compare to your actual marks?

**Study Patterns**

Can you tell me a little about how you approach your study?

How do you get started with a study session?

Do you multitask as you study? Do you have any social networking or email sites open while you are studying? If so, how do you use them within your study period?

When you study, do you try to work for several hours at a time, or might you study for 10 to 20 minutes when the opportunity presents itself? Or both?

While you are studying, do you take regular breaks away from the computer? (or not)?

Do you generally prefer to study alone or with others? Why?

Where do you generally prefer to study?

[if answered in survey] frequency_of_travel_study_time, Study_travel_time_activities.

Explain how you study while travelling to uni, or travelling elsewhere.

[maybe already answered...] When you study within the LMS and with Lectopia, can you describe a typical process?
[maybe already answered...] How did you deal with different unit elements? (Did you download several readings at a time and read them later, or read one at a time? Did you listen to audio elements as you find them, or save them for later? How regularly did you use the LMS?)

[Refer to survey results about "special_different_about.study", and ask about this response as needed]

How do you normally finish up a study session?

Family
The survey indicated that you come from a [high/ medium/ low SES area]. Is this accurate in your opinion?

Are you the first in your family to go to uni?

You said that your parents' level of education was [see survey]. How has this impacted on the way you've approached uni this year?

[if reported] In the survey, you reported having a disability. Can you tell me how you used technology to assist your study? Or maybe it made it harder...

Do you have any additional questions or comments to make?

3.0 Closure
The interviewer thanks the participant for their time and valuable contribution and explains procedures relating to feedback about data, confidentiality, etc.

The interviewer asks about the sort of voucher the student would like. Ensure that the consent form contains a postal address.

The interviewer ensures that the participant still feels positive about participating in the research. The interviewer also ensures that the participant leaves the interview venue with a copy of the required documentation (information letter, etc.)
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