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Examining student satisfaction with wholly online learning

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Abstract

Learner satisfaction has been shown to be positively correlated with quality of learning outcomes. An understanding of the factors that influence student satisfaction with online learning in a particular context can be used as an input to the appropriate design of learning environments, and for the provision of targeted support to students, with an aim to positively influence the student online learning experience. Following the mandatory inclusion of at least one wholly online unit of study in all undergraduate programs at Deakin University, a large ‘experiences of learning online’ (ELO) survey was undertaken to gauge students’ perceptions of studying in wholly online mode. A multivariate linear regression of all the questionnaire items was performed against an overall satisfaction item. Five items were found to significantly contribute to a model that explained approximately 70 % of reported student satisfaction. Factors that were found to positively influence student satisfaction with studying a wholly online unit primarily related to how confident they felt about their ability to communicate and learn online, having a clear understanding of what was required to succeed in the unit and how well they thought they were performing in the unit. Other results are also reported.
Introduction

Research by Ramsden and Entwistle in Britain in the early 1980s with a Course Perception Questionnaire established a link between students' perception of satisfaction with their learning environment and their quality of learning (level of engagement and learning outcomes) (Ramsden and Entwistle, 1981). Subsequent work in Australia during the 1980s on a Course Experience Questionnaire (CEQ) led to a 1990 national survey of students which confirmed the reliability and validity of the CEQ (Ramsden, 1991). While the CEQ does not specifically seek to measure student satisfaction with online learning, there is research that suggests that the same principle of student satisfaction with their learning environment being an important measure of their approach to learning applies equally to online students as it does to learners more generally (Johnson, 2006a). In the context of online learning, it has been suggested that learner satisfaction is an important contributor to student continuance, hence those involved in online learning should be concerned about increasing learning satisfaction (Chiu et al., 2006 article in press). It is also recognised that student satisfaction with online learning is a complex and multidimensional construct that includes a wide range of factors (Saadé and Kira, 2006). The literature provides some guidance as the factors which may contribute to student satisfaction with online learning.

Based on a survey of 1862 students from a range of Asian universities, students perceived the greatest disadvantages of online learning to be in relation to their greater comfort with more traditional mediums and their inexperience using computers: “I am more comfortable learning from print material”; “working from a computer is physically tiring”; “I am more comfortable learning face to face”; and “limited interaction with instructor” (Zhang
and Perris, 2004, p. 258). In a meta-analysis of the recent literature, a wide range of factors were found to contribute to student satisfaction with online learning, including clarity and relevance of assignments and communication, access to campus-based resources, availability of technical support, and, orientation to the course, technology and equipment (Johnston et al., 2005). From a survey of 41 speech and language therapy students, it was found that online learning required a commitment from students to active learning that lectures did not – students found it “hard to motivate themselves” or “difficult to prioritise” and that it was “tempting to leave until the last minute” (Upton, 2006, p. 29). Individual student characteristics affect their behaviours in, and perceptions of, online learning (Johnson, 2006b), including their prior experience with technology (Smart and Cappel, 2006). In a review of the literature to examine the potential of online learning for occupational therapy, a range of factors were identified as potentially influencing students’ performance and satisfaction levels with online learning, and it was concluded that, “Students who are independent learners, persistent, organized in terms of time management, and motivated are good candidates for online learning”, and, “Appropriate preparation and support for both students and faculty members in online learning situations needs to be available” (Hollis and Madill, 2006, p. 74). In an investigation of ways to increase online learner satisfaction, factors reported to contribute to satisfaction included aspects related to perceived ‘fairness’ of assessment, and the impact of personal cognition, such as self-efficacy, computer confidence and locus of control (Chiu et al., 2006 article in press). Based on a survey of 295 online learners from two Taiwanese universities, the most significant factors found to influence learner satisfaction were learner computer anxiety, e-learning course quality, perceived ease of use, and diversity in assessment (Sun et al., 2007 article in press). In the context of developing theoretically based pedagogical strategies for online learning in the field of gerontology, a review of the literature identified that high student satisfaction in
online courses is supported by a syllabus that provides guidance for successful completion of all assignments – clear expectations and explanations should be provided (Majeski and Stover, 2007).

With a knowledge of the factors that contribute to student satisfaction in online learning, we can intentionally act to provide appropriate support and design appropriate online learning environments to positively impact on student satisfaction, with the expectation that this will positively influence student engagement with the learning, and, ultimately, positively influence student learning outcomes (Hollis and Madill, 2006, Smart and Cappel, 2006, Upton, 2006). Building on this foundation from the literature, and seeking to draw on survey data from a comparatively large student sample group at Deakin University in Australia, this paper presents an empirical research project to identify those factors contributing to student satisfaction with online learning in the context of Deakin University.

**Wholly online units at Deakin University**

In Australia, Deakin University is a major provider of distance and online education. It teaches on four campuses located in three cities in the State of Victoria. Initially, Deakin saw itself as a major distance education provider, with some degree of separation between its teaching methods and materials used for on-campus teaching as opposed to off-campus teaching. The use of distance education methodologies and materials for both student cohorts gathered momentum in the early to mid-1990s under the strategic umbrella of flexible teaching and learning, and with a growing ‘technological imperative’ (Holt and Thompson, 1995) for the use online of systems for learning delivery and communication. In
more recent times the University has attempted to implement institution-wide online teaching and learning systems to provide opportunities to bring together all students in the one learning community. Such inclusively designed online learning environments are seen to provide all students, irrespective of their official mode of enrolment and location, with equal access to learning resources and channels of communication with their teachers, fellow students, and academic and administrative support services. This might be seen idealistically; however, pragmatically all universities are now confronted even with their so-called ‘full-time’ campus-based students with the need to provide more flexible, time and/or place independent study pathways in the face of growing trends towards increasing paid-time employment and student mobility. It would seem that even traditional, school-leaver campus-based student cohorts are taking on the characteristics of their mature-aged, in-employment, off-campus counterparts. This is happening to such an extent that we might argue that many students now seem to be having the distance-type learning experience to one degree or another.

A key initiative in the University’s strategy to expand its online and distance education profile related to offering all its units at three levels of online-ness: Basic, Extended and Wholly Online. At a ‘Basic’ level, online presence required the delivery of a unit guide, some learning resources and a moderated discussion space. An ‘Extended’ online presence related to anything above ‘Basic’ but falling short of ‘Wholly’ online. Being ‘Wholly’ online was originally defined as: all content online (either commercial print-based textbooks or commercial e-texts could be used as supplementary material); all communication and interaction with students online; assignment submission and feedback online (with examinations moving online when the University was administratively ready); and each unit having at least ONE session of interactive communication (synchronous, asynchronous, or both) between teacher and students online at least weekly or as established
at the beginning of the course. Such interactive sessions were to have an assessable component where appropriate (Deakin University, 2005).

From 2004, all students enrolled in Deakin undergraduate courses had to undertake at least one unit wholly online, with few exemptions given. At face value undertaking a unit online (indeed, only online) is not a novel learning experience. Neither for that matter is taking an entire course online. It is suggested, however, that the mandated nature of taking a unit wholly online, irrespective of a students’ predominant mode of enrolment and study (i.e. internal/on-campus, full-time/part-time, external/off-campus) does represent a different teaching design challenge and student learning experience. It means that effectively whether students choose to or not, they are operating in a common online environment and interacting with a range of student cohorts whom they would not necessarily come into regular or any contact. While ‘never the twain might normally meet’ between on- and off-campus students (or where such students might visit the same online unit site, but operate in quite separate discussion realms), all types of students met together as one overall community of learners for the wholly online learning experience. From the teachers’ perspective, the students’ normal mode of enrolment and study could not be discerned in such environments. The rationale provided by senior management and policy makers in the University for the wholly online unit initiative related to the further development of lifelong learning through the: acquisition and practice of a range of technical skills needed to work effectively in online environments; development of an understanding of issues and learning to act in an ethical and responsible manner in virtual environments; development of skills in online communication; development of a capacity for online teamwork, collaboration and negotiation; assessment and evaluation of the quality of online information; development of organisational and personal management skills necessary to sustain motivation and study
effectively and successfully without regular face-to-face contact with teachers and other students.

As part of an on-going research project into the nature and impact of the introduction of mandatory wholly online units at Deakin University (Holt and Challis, 2007), during 2005 and 2006, the second author undertook a large online survey of students enrolled in wholly online units to gauge students’ perceptions of studying wholly online units. The first author joined the project to help undertake the analysis and interpretation of the survey data. The ‘experiences of learning online’ (ELO) survey was made available to a potential respondent group of 5,862 students enrolled in the 21 separate unit offerings. The current phase of the EOL research project sought to identify those factors contributing to student satisfaction with online learning at Deakin University in Australia.

**Method**

During 2005 and 2006, students enrolled in a wide range of wholly online units at Deakin University were invited to complete the ELO survey. The ELO survey sought information regarding:

- student demographics;
- total time spent studying unit and time spent online for the unit;
- the organisation and structure of the unit;
- teaching and learning aspects of the unit;
- interactions with teaching staff and other students;
- unit assessment;
- graduate attribute development;
• student performance in the unit; and
• how the unit had influenced the student’s approach to learning.

For most of these topics, the survey included two types of question items; a) items seeking student satisfaction and relative importance ratings; and b) items seeking student agreement level with descriptive ‘satisfaction’ statements. The literature on ‘customer satisfaction’ suggests that both approaches can provide insights into the factors contributing to satisfaction (Danaher, 1997, Gustafsson and Johnson, 2004). The ELO questionnaire was developed from previous similar survey instruments used at Deakin University (Armatas et al., 2004, Challis, 2005) and elsewhere (Center for Support of Teaching and Learning, 2006, Enhancing Teaching and Learning Project, 2002), and within the constraints of the available Deakin University online survey administration system. The complete ELO questionnaire is included in Appendix A.

The collected data were analysed and the following information was compiled:

• response rate and demographic comparison information;
• descriptive statistics for the survey results;
• importance-satisfaction analysis;
• satisfaction measures; and
• multivariate linear regression to find the significant independent questionnaire items contributing to the dependent questionnaire item ‘How satisfied have you been with this unit being offered wholly online?’
Results and discussion

Response rate and demographic information

Of the overall population of 5,862 students enrolled in the 21 separate unit offerings included in the ELO survey, survey responses were received from 761 students, yielding an overall effective sample response rate of 13.0 percent. Common demographic information that was known or could be inferred for both population and sample groups included unit of study, gender and mode of study. The proportion of respondents in each unit was not the same as the proportion enrolled in each unit in the population group. Given the number of units involved, it is very difficult to achieve a statistically significant similarity of proportions, a task made more difficulty by the varying degrees to which participation in the survey was promoted across the units included. The population and respondent groups were both relatively large, and the gender results satisfied Cochran’s rule (no expected frequency less than 1 and no more than 20% of expected frequencies less than 5), permitting a chi-square goodness-of-fit test. The overall gender proportions of the respondent and population (female = 59.7 percent, male = 40.3 percent) groups were not significantly different ($\chi^2_{1} = 1.1, p > 0.295$). For students enrolled in wholly online units, it was found that the ‘normal mode of study’ recorded in the student enrolment database was not always accurate, making it difficult to meaningfully compare the proportions of normal mode of study between the population and sample groups. While the large sample size and good demographic match between gender proportions are encouraging, given the comparatively low response rate, we exercise caution in attempting to generalise the sample responses to the wider student population.
Background information

Table 1 presents a summary of the responses obtained from the Background Information section of the questionnaire.

[Insert Table 1 about here]

As previously noted, the gender proportions were not significantly different from the enrolled population in all wholly online units surveyed, and similar to the overall university student gender mix at the time of the survey (58.5 % female in 2006). More than 80 % of respondents were under 25 years of age; this result is not surprising given the predominance of ‘conventional entry’ students commencing university at age 18 or 19, directly from secondary school. With hindsight, a finer response scale for respondent age may have yielded more useful age demographic information. The respondent on-campus study mode proportion of 83.3 % compares to the study-load-weighted on-campus proportion of 75.6 % in the general Deakin student population in 2006.

Respondents reported comparatively low results for both hours per week of study and hours per week online for their wholly online unit – in both categories close to 70 % of respondents reported four hours per week or less. These results compare to a survey of 266 students studying a microeconomics unit in online mode (95 % of whom were full-time, on-campus students, simultaneously enrolled in face-to-face units) where it was found that 51 % of respondents reported spending 0 to 3 hours per week on the unit, and another 39 % of respondents reported spending 4 to 5 hours per week on the unit (Brown and Liedholm, 2004). While the nominal expected study load varies between disciplines, it would normally be expected that Deakin students would commit between eight and ten hours per week per
unit for study. It has been noted that students may use online learning environments in ways
different to that intended by the designers of those environments, interacting in ways that are
apparently not conducive to experiencing the full potential benefits of such environments,
with many students utilising only the most essential elements of such systems in the most
basic manner required to be successful in their studies (Beasley and Smyth, 2004). While
apparently low levels of engagement with online study are noted, it is important to remember
that time allocated to online study is not independent from other claims on a student’s time,
but, is a complex trade-off against other activities such as work, recreation and other units of
study (Brown and Liedholm, 2004). It is noted that simple quantitative measures of time
spent in online learning activities may not be an accurate measure of the ‘quality’ of learning
taking place, and that the whole area of time spent in online learning is currently under-
researched (Tallent-Runnels et al., 2006).

**Importance-satisfaction analysis**

The ELO evaluation survey asked respondents to rate the importance of, and their
satisfaction with, a range of elements relating to wholly online learning at Deakin
University. A rating of 1 represented low importance, while a rating of 7 represented high
importance. A rating of 1 represented low satisfaction, while a rating of 7 represented high
satisfaction. For both importance and satisfaction a ‘not applicable’ option was also
provided to permit students not using a particular element to avoid having to provide a
contrived rating. Table 2 provides a summary of the mean responses for the importance and
satisfaction ratings.

[Insert Table 2 about here]
A method for visualising and interpreting importance-satisfaction data is the importance-satisfaction grid (Aigbedo and Parameswaran, 2004) – where the importance rating is plotted on the vertical axis and the satisfaction rating is plotted on the horizontal axis. Figure 1 shows the ELO survey data plotted as an importance-satisfaction grid – the number labels correspond to the question numbers given in Table 2. The grid is divided into quadrants using the grand mean values for all importance ratings as a vertical divider and the grand mean of all satisfaction ratings as a horizontal divider. The interpretation of the quadrants is normally as follows:

- Quadrant D: low importance and low satisfaction – low priority items;
- Quadrant C: low importance and high satisfaction – possibly doing more than necessary on these items;
- Quadrant B: high importance and high satisfaction – keep up the good work! and
- Quadrant A: high importance and low satisfaction – concentrate improvement efforts on these items.

However, given that students are not normally free to choose many aspects of their study, in the context of higher education, the results of the importance-satisfaction grid need to be interpreted with some caution.

[Insert Fig 1 about here]

Students seemed to place the lowest value on ‘Being able to learn without regular face-to-face contact’ and ‘Interacting online with other students’. The low importance given to these items is somewhat surprising, given that they might be considered fundamental aspects of wholly online learning. ‘Completing online quizzes/tests’ was also given a low
value by students, possibly due to the fact that, at the time of the ELO survey, many study units at Deakin either did not use online quizzes, or, if used, they were not included as part of the formal assessment for the unit. Aspects of learning online that students were generally happy with and rated highly included ‘Submitting assignments online’, ‘Being able to access online/digital learning resources readily’ and ‘Organising and being responsible for your own learning’. The high perceived value that students give to the online management of assignment submission has been noted previously (Palmer, 2005), as has been the use and educational value of online learning resources (Grabe and Christopherson, 2008), and we take some comfort that students rated the performance of the online systems for material delivery highly.

Students gave the highest importance rating in combination with the lowest satisfaction rating to ‘Having clear expectations of what is required to get good marks’ and ‘Receiving feedback on assignments online’. Students indicating relatively low satisfaction (at least initially) with the ‘wholly online’ aspects of the units introduced for the wholly online unit initiative at Deakin was not an isolated experience (Goold and Coldwell, 2005). Students indicating low satisfaction with clarity of unit assessment expectations and quality of assignment feedback are perennial issues reported in higher education; a situation clearly not automatically improved by wholly online delivery:

Students study more effectively when they know what they are working towards. Students value transparency in the way their knowledge is assessed: they seek a clear relationship between lectures, tutorials, practical classes and subject resources, and what they are expected to demonstrate. They also wish to understand how grades are determined and expect timely feedback that 1) explains the grade they have received, 2) rewards their achievement, 3) offers suggestions for how they can improve, and 4) can be used within the subject or their course. (James et al., 2002)
Level of satisfaction questionnaire items

The ELO survey contained questionnaire items seeking student level of agreement (generally, on a scale of 1 - 5) with descriptive ‘satisfaction’ statements, results are presented in Table 3.

[Insert Table 3 about here]

All of the mean results in Table 3 recorded comparatively large standard deviations, indicating a generally wide distribution of student ratings. The highest mean rating was given to the item ‘I am confident of my ability to learn online’, suggesting that students were not generally intimidated by the wholly online mode of delivery. The second highest mean rating was for the item ‘I was able to track down online information in this subject area and use it effectively’, suggesting that the online unit-related resources made available to students were generally judged as accessible and adequate. A close third highest mean rating was for the item ‘Online, students supported one other and tried to give help when it was needed’, indicating that many students engaged in a collegial manner using the online environment, contributing to an online community of learners. The two items with the lowest mean rating were ‘The feedback given on my assessable work helped me clarify things I hadn’t fully understood’ and ‘The feedback given on my assessable work helped me to improve my ways of learning and studying’, reinforcing the findings from the relative importance questionnaire items above that students desire meaningful feedback on their work.

A key item of importance for this study questionnaire item 39 – ‘How satisfied have you been with this unit being offered wholly online?’ As noted previously, student
perception of satisfaction has been shown to be strongly associated with the approach to learning and learning outcomes. Table 4 shows the response distribution for item 39.

[Insert Table 4 about here]

While 44.8% of respondents indicated that they were at least generally satisfied with wholly online delivery (taken as a rating of 4 or 5), there were also nearly one third of respondents who rated their satisfaction with wholly online delivery as less than neutral (taken as a rating of 1 or 2). When the mean agreement values reported in Table 3 are ranked (after scaling the mean value for item 38 to be comparable on a scale of 1-5), it was found that item 39 ranked fourteenth (fourth last) out of 17 questionnaire satisfaction items. As noted previously, there has been anecdotal reporting of significant student dissatisfaction (at least initially) with many wholly online units at Deakin University. This investigation was the first large-scale, formal evaluation of the introduction of wholly online units, and these findings support the reporting of significant levels of student dissatisfaction with wholly online delivery.

**Multivariate regression**

It was not possible, due to the human research ethics approval process requiring that survey responses be anonymous, to directly match individual student learning outcomes/achievement (grades) to survey response data sets. Instead, based on the literature which establishes a link between learning outcomes and student satisfaction, we rely on self-reported student satisfaction as a proxy indicator of learning outcomes. A multivariate linear regression of all the questionnaire items was performed against item 39 – ‘How satisfied
have you been with this unit being offered wholly online?’ All other items were initially introduced as independent variables, and step-wise regression was performed until all remaining variables were significant. Table 5 presents the variables, and their corresponding coefficients and significance, of the linear regression model in order of contribution for the dependent variable.

[Insert Table 5 about here]

The questionnaire items related to the model variables are:

8. (Satisfaction) Being able to learn without regular face-to-face contact.
28. (Satisfaction) Having clear expectations of what is required to get good marks.
34. (Satisfaction) Having the ability to communicate knowledge and ideas effectively online.
38. How well do you think you're doing in this unit as a whole?
37. I am confident of my ability to learn online.

An Analysis of Variance (ANOVA) test suggests that the regression model is significant \(F_{603} = 273.52, p < 7 \times 10^{-152}\), though the model predicts only 69.6 % of the variation on final unit mark \(R^2 = 0.696\). The regression residuals were approximately normally distributed. The model explains only just over two thirds of the variation observed student satisfaction rating, hence there exist other factors with a significant influence on student satisfaction that were not included in the ELO survey. Strictly, all of these variables were ordinal rather than interval, so care must be taken in interpreting the multi-regression model literally. However, it does indicate those factors that contribute the most to the students’ response in Q39. Basically, students are more satisfied taking a unit in wholly online mode if they feel competent/confident working wholly online, if they have been given
clear guidance on unit requirements and if they feel they are doing well in the unit. Student self-efficacy in an online learning environment as a key contributor to overall satisfaction is a common theme noted in the literature (Artino, 2008). The regression analysis presented here identified the key contributing factors, and their relative direct contribution, to student satisfaction, but did not attempt to establish the nature of any interaction that might also exist between the contributing factors. Having thus identified the key factors, a possible future elaboration on these findings could be the proposition of one or more models relating the key factors to student satisfaction, for which path analysis (Lent et al., 2007, Suhre et al., 2007) could be employed to determine path coefficients and/or compare the relative performance of different models.

**Conclusions**

Following the mandatory inclusion of at least one wholly online unit of study in all undergraduate programs at Deakin University, a large ‘experiences of learning online’ (ELO) survey was undertaken to gauge students’ perceptions of studying in wholly online mode. Most respondents (about 70 %) indicated that they spent four hours per week or less studying for the wholly online unit; it would normally be expected that students would spend eight to ten hours per week per unit in study. Respondents were asked to indicate the importance of, and satisfaction with, a range of aspects of their wholly online study. Surprisingly, the items with the lowest importance rating were those that might be considered basic requirements for online learning, including being able to learn without face-to-face contact and interacting online with other students. The items with the highest satisfaction were unit related activities facilitated by the online environment, such as
assignment submission and access to digital resources. The items with the largest ‘gap’ between importance and satisfaction ratings were having clear expectations of what is required to succeed in the unit and receiving feedback on assignments online. So, many students in wholly online units were most concerned about the same things that concern any student – what do they need to know/do to get a good mark/grade and receiving useful feedback on their assignment work.

Respondents were also asked to indicate their level of agreement with a range of statements. Those items with the highest agreement related to the students’ positive operational use of the online learning environment, suggesting good engagement with online learning. Those items with the lowest agreement related to the quality of assignment feedback. The ELO questionnaire contained the item 39 - ‘how satisfied have you been with this unit being offered wholly online?’ While 44.8 % of respondents indicated that they were at least generally satisfied, nearly one third of respondents rated their satisfaction with wholly online delivery as less than neutral. A multivariate linear regression of all the questionnaire items was performed against item 39. Five items were found to significantly contribute to a model that explained approximately 70 % of reported student satisfaction. Within the limitations of the respondent sample size and without claiming generalisation beyond the population group, factors that were found to positively influence student satisfaction with studying a wholly online unit primarily related to how confident they felt about their ability to communicate and learn online, having a clear understanding of what was required to succeed in the unit and how well they thought they were performing in the unit. These empirical findings are not inconsistent with other investigations documented in the literature and suggest design and management strategies for online learning environments to maximise student satisfaction and, hence, contribute positively to student learning outcomes.
Academic staff need to be able to articulate a clear and convincing rationale as to why students need to undertake a study unit in wholly online mode in the first place. Students need to be equipped to be competent and confident in operating in the wholly online mode, either before and/or as part of taking a wholly online unit. A carefully designed and executed formal assessment regime is required, which is clear and relevant and with constructive and timely feedback. On-going communication between teachers and students, and amongst students, should be facilitated through practice and/or assessable tasks. While it may not be possible, or desirable, to make a student feel they are performing better academically in a unit than they actually are, providing several assessment points during the unit, with prompt feedback could help them confirm their own judgment of their academic performance. The inclusion of mandatory tasks that require regularly and on-going interaction with the unit materials, such as assessed contributions to an online discussion forum, could assist in boosting student engagement with the unit, and in raising the comparatively low hours per week of unit-related study for wholly online units observed in this investigation.

References


Deakin University (2005) *Online Technologies in Courses and Units - Procedure*. Available at: http://theguide.deakin.edu.au/TheDeakinGuide.nsf/7264c32fe71924374a2566f3000a65de/4d252055c8941cfbca256e64000f8bb3 (last accessed 5 March 2007).


Table 1. Respondent Background information

<table>
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<tr>
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<th>Female</th>
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<td>38.4 %</td>
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<th>36-49</th>
<th>Over 50</th>
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<th>Off-campus (international)</th>
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<th>Up to 2</th>
<th>2-4</th>
<th>5-7</th>
<th>8-10</th>
<th>More than 10</th>
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<td>30.9 %</td>
<td>37.3 %</td>
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<th>2-4</th>
<th>5-7</th>
<th>8-10</th>
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<td></td>
<td>42.3 %</td>
<td>36.1 %</td>
<td>14.2 %</td>
<td>3.3 %</td>
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### Table 2. Mean (and standard deviation) respondent importance-satisfaction data

<table>
<thead>
<tr>
<th>Questionnaire item</th>
<th>Importance (Mean 1-7)</th>
<th>Satisfaction (Mean 1-7)</th>
</tr>
</thead>
<tbody>
<tr>
<td>7. Being able to access online/digital learning resources readily</td>
<td>6.12 (1.37)</td>
<td>4.89 (1.59)</td>
</tr>
<tr>
<td>8. Being able to learn without regular face-to-face contact</td>
<td>4.81 (1.97)</td>
<td>4.05 (1.93)</td>
</tr>
<tr>
<td>9. Organising and being responsible for your own learning</td>
<td>5.78 (1.46)</td>
<td>4.75 (1.71)</td>
</tr>
<tr>
<td>13. Being given and/or pointed to current material</td>
<td>5.60 (1.52)</td>
<td>4.63 (1.69)</td>
</tr>
<tr>
<td>14. Relating what is learnt to issues in the wider world</td>
<td>5.48 (1.57)</td>
<td>4.61 (1.70)</td>
</tr>
<tr>
<td>15. Having work that helps make connections to existing knowledge/experience</td>
<td>5.42 (1.57)</td>
<td>4.54 (1.69)</td>
</tr>
<tr>
<td>19. Interacting online with teaching staff</td>
<td>5.50 (1.78)</td>
<td>4.37 (1.98)</td>
</tr>
<tr>
<td>20. Interacting online with other students</td>
<td>4.83 (1.93)</td>
<td>4.34 (1.85)</td>
</tr>
<tr>
<td>21. Interacting with staff who convey their enthusiasm for this area</td>
<td>5.26 (1.84)</td>
<td>4.31 (2.00)</td>
</tr>
<tr>
<td>25. Completing online quizzes/tests</td>
<td>4.90 (2.33)</td>
<td>4.34 (2.27)</td>
</tr>
<tr>
<td>26. Submitting assignments online</td>
<td>5.79 (1.57)</td>
<td>5.20 (1.81)</td>
</tr>
<tr>
<td>27. Receiving feedback on assignments online</td>
<td>5.97 (1.65)</td>
<td>4.12 (2.15)</td>
</tr>
<tr>
<td>28. Having clear expectations of what is required to get good marks</td>
<td>6.22 (1.39)</td>
<td>4.13 (1.96)</td>
</tr>
<tr>
<td>32. Having the opportunity to develop/practice online technical skills</td>
<td>5.01 (1.80)</td>
<td>4.52 (1.79)</td>
</tr>
<tr>
<td>33. Learning to judge the quality of online information</td>
<td>5.29 (1.63)</td>
<td>4.59 (1.67)</td>
</tr>
<tr>
<td>34. Having the ability to communicate knowledge and ideas effectively online</td>
<td>5.19 (1.61)</td>
<td>4.49 (1.67)</td>
</tr>
</tbody>
</table>
### Table 3. Mean (and standard deviation) respondent level of satisfaction data

<table>
<thead>
<tr>
<th>Questionnaire item</th>
<th>Agreement (Mean 1-5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10. From the start, it was clear to me what I was supposed to learn in this unit</td>
<td>3.20 (1.24)</td>
</tr>
<tr>
<td>11. From the start, it was clear to me how I was supposed to learn from the various online/digital learning resources</td>
<td>3.26 (1.24)</td>
</tr>
<tr>
<td>12. The amount of work required was appropriate</td>
<td>3.53 (1.16)</td>
</tr>
<tr>
<td>16. I was encouraged to rethink my understanding of some aspects of the subject matter</td>
<td>3.19 (1.09)</td>
</tr>
<tr>
<td>17. Examples and illustrations were given to help us to grasp things better</td>
<td>3.50 (1.18)</td>
</tr>
<tr>
<td>18. I was prompted to think about how I could develop my learning</td>
<td>3.09 (1.14)</td>
</tr>
<tr>
<td>22. Staff helped us to see how we are supposed to think about and reach conclusions in the subject</td>
<td>3.21 (1.19)</td>
</tr>
<tr>
<td>23. Staff were patient in explaining things online which seemed difficult to grasp</td>
<td>3.42 (1.26)</td>
</tr>
<tr>
<td>24. Online, students supported one other and tried to give help when it was needed</td>
<td>3.55 (1.10)</td>
</tr>
<tr>
<td>29. I could see how the assessable work fitted in with what we were supposed to learn</td>
<td>3.50 (1.11)</td>
</tr>
<tr>
<td>30. The feedback given on my assessable work helped me to improve my ways of learning and studying</td>
<td>2.89 (1.27)</td>
</tr>
<tr>
<td>31. The feedback given on my assessable work helped me clarify things I hadn't fully understood</td>
<td>2.76 (1.25)</td>
</tr>
<tr>
<td>35. I was able to track down online information in this subject area and use it effectively</td>
<td>3.57 (1.09)</td>
</tr>
<tr>
<td>36. I was encouraged to think about ideas and solve problems</td>
<td>3.41 (1.12)</td>
</tr>
<tr>
<td>37. I am confident of my ability to learn online</td>
<td>3.66 (1.19)</td>
</tr>
<tr>
<td>38. How well do you think you're doing in this unit as a whole? Please try to rate yourself objectively, based on any marks, grades or comments you have been given [*Rated on a different scale: 1 = Rather badly; 4 = Very well]</td>
<td>2.80 (0.81)*</td>
</tr>
<tr>
<td>39. How satisfied have you been with this unit being offered wholly online?</td>
<td>3.12 (1.32)</td>
</tr>
</tbody>
</table>
Table 4. Response distribution for questionnaire item 39 - student satisfaction with wholly online unit

<table>
<thead>
<tr>
<th>Questionnaire item</th>
<th>Frequency</th>
<th>Percent</th>
<th>Cumulative %</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - Very dissatisfied</td>
<td>133</td>
<td>17.5 %</td>
<td>17.5 %</td>
</tr>
<tr>
<td>2</td>
<td>104</td>
<td>13.7 %</td>
<td>31.1 %</td>
</tr>
<tr>
<td>3</td>
<td>183</td>
<td>24.0 %</td>
<td>55.2 %</td>
</tr>
<tr>
<td>4</td>
<td>219</td>
<td>28.8 %</td>
<td>84.0 %</td>
</tr>
<tr>
<td>5 - Very Satisfied</td>
<td>122</td>
<td>16.0 %</td>
<td>100.0 %</td>
</tr>
</tbody>
</table>
Table 5. Multivariate linear regression model for dependant questionnaire item 39

<table>
<thead>
<tr>
<th>Questionnaire item</th>
<th>Coefficient</th>
<th>Standard error</th>
<th>Beta</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item 8S</td>
<td>0.259</td>
<td>0.022</td>
<td>0.364</td>
<td>$p &lt; 2 \times 10^{-28}$</td>
</tr>
<tr>
<td>Item 28S</td>
<td>0.138</td>
<td>0.020</td>
<td>0.197</td>
<td>$p &lt; 3 \times 10^{-11}$</td>
</tr>
<tr>
<td>Item 34S</td>
<td>0.156</td>
<td>0.026</td>
<td>0.186</td>
<td>$p &lt; 4 \times 10^{-9}$</td>
</tr>
<tr>
<td>Item 38</td>
<td>0.269</td>
<td>0.047</td>
<td>0.161</td>
<td>$p &lt; 2 \times 10^{-8}$</td>
</tr>
<tr>
<td>Item 37</td>
<td>0.164</td>
<td>0.035</td>
<td>0.145</td>
<td>$p &lt; 3 \times 10^{-6}$</td>
</tr>
<tr>
<td>Constant</td>
<td>-0.599</td>
<td>0.122</td>
<td>—</td>
<td>$p &lt; 2 \times 10^{-6}$</td>
</tr>
</tbody>
</table>
Fig 1. Importance-satisfaction grid
Appendix 1 Experiences of Learning Online survey

This survey is to assist us understand student experiences in using new digital media and online technologies for learning. The results will be used to enhance the quality of wholly online units for future students. When we refer to your experiences of teaching and learning online in the survey items, we want you to consider the full array of digital and online information and communications technologies used in the unit. These may include your use of the learning management system, Deakin Studies Online, any accompanying CD-ROMs provided, private electronic mail, voicemail, standard fixed telephones, SMS cellular phones, Deakin’s gateway, Portal and Deakin Learning Toolkit, the WWW and any other Internet uses.

BACKGROUND

1: What wholly online unit are you studying this semester? [List of surveyed units]
2: What is your gender? [Female, Male]
3: What is your age? [Under 25, 26-35, 36-49, Over 50]
4: What is your mode of study? [On-campus, Off-campus (Australia), Off-campus (international)]
5: On average, how many hours a week did you spend studying this unit? [Up to 2, 2-4, 5-7, 8-10, More than 10]
6: On average, how many hours a week did you spend connected online for this unit? [Up to 2, 2-4, 5-7, 8-10, More than 10]

ORGANISATION & STRUCTURE

Please indicate how important each of the following is for you and how satisfied you were with what occurred in this unit. 1=LOW; 7=HIGH.
7: Being able to access online/digital learning resources readily. [Importance: N/A, 1 - 7] [Satisfaction: N/A, 1 - 7]
8: Being able to learn without regular face-to-face contact. [Importance: N/A, 1 - 7] [Satisfaction: N/A, 1 - 7]
9: Organising and being responsible for your own learning. [Importance: N/A, 1 - 7] [Satisfaction: N/A, 1 - 7]

Please indicate the extent to which you agree with the following statements. Strongly disagree=1 / Strongly agree=5
10: From the start, it was clear to me what I was supposed to learn in this unit. [Agree: 1 – 5]
11: From the start, it was clear to me how I was supposed to learn from the various online/digital learning resources. [Agree: 1 – 5]

12: The amount of work required was appropriate. [Agree: 1 – 5]

**TEACHING & LEARNING**

Please indicate how important each of the following is for you and how satisfied you were with what occurred in this unit. 1=LOW; 7=HIGH.

13: Being given and/or pointed to current material. [Importance: N/A, 1 - 7] [Satisfaction: N/A, 1 - 7]

14: Relating what is learnt to issues in the wider world. [Importance: N/A, 1 - 7] [Satisfaction: N/A, 1 - 7]

15: Having work that helps make connections to existing knowledge/experience. [Importance: N/A, 1 - 7] [Satisfaction: N/A, 1 - 7]

Please indicate the extent to which you agree with the following statements. Strongly disagree=1 / Strongly agree=5

16: I was encouraged to rethink my understanding of some aspects of the subject matter. [Agree: 1 – 5]

17: Examples and illustrations were given to help us to grasp things better. [Agree: 1 – 5]

18: I was prompted to think about how I could develop my learning. [Agree: 1 – 5]

**TEACHING STAFF & OTHER STUDENTS**

Please indicate how important each of the following is for you and how satisfied you were with what occurred in this unit. 1=LOW; 7=HIGH.

19: Interacting online with teaching staff. [Importance: N/A, 1 - 7] [Satisfaction: N/A, 1 - 7]

20: Interacting online with other students. [Importance: N/A, 1 - 7] [Satisfaction: N/A, 1 - 7]

21: Interacting with staff who convey their enthusiasm for this area. [Importance: N/A, 1 - 7] [Satisfaction: N/A, 1 - 7]

Please indicate the extent to which you agree with the following statements. Strongly disagree=1 / Strongly agree=5

22: Staff helped us to see how we are supposed to think about and reach conclusions in the subject. [Agree: 1 – 5]

23: Staff were patient in explaining things online which seemed difficult to grasp. [Agree: 1 – 5]

24: Online, students supported one other and tried to give help when it was needed. [Agree: 1 – 5]
ASSESSMENT

Please indicate how important each of the following is for you and how satisfied you were with what occurred in this unit. 1=LOW; 7=HIGH.

25: Completing online quizzes/tests. [Importance: N/A, 1 - 7] [Satisfaction: N/A, 1 - 7]
26: Submitting assignments online. [Importance: N/A, 1 - 7] [Satisfaction: N/A, 1 - 7]
27: Receiving feedback on assignments online. [Importance: N/A, 1 - 7] [Satisfaction: N/A, 1 - 7]
28: Having clear expectations of what is required to get good marks. [Importance: N/A, 1 - 7] [Satisfaction: N/A, 1 - 7]

Please indicate the extent to which you agree with the following statements. Strongly disagree=1 / Strongly agree=5

29: I could see how the assessable work fitted in with what we were supposed to learn. [Agree: 1 – 5]
30: The feedback given on my assessable work helped me to improve my ways of learning and studying. [Agree: 1 – 5]
31: The feedback given on my assessable work helped me clarify things I hadn’t fully understood. [Agree: 1 – 5]

ATTRIBUTE DEVELOPMENT

Please indicate how important each of the following is for you and how satisfied you were with what occurred in this unit. 1=LOW; 7=HIGH.

32: Having the opportunity to develop/practice online technical skills. [Importance: N/A, 1 - 7] [Satisfaction: N/A, 1 - 7]
33: Learning to judge the quality of online information. [Importance: N/A, 1 - 7] [Satisfaction: N/A, 1 - 7]
34: Having the ability to communicate knowledge and ideas effectively online. [Importance: N/A, 1 - 7] [Satisfaction: N/A, 1 - 7]

Please indicate the extent to which you agree with the following statements. Strongly disagree=1 / Strongly agree=5

35: I was able to track down online information in this subject area and use it effectively. [Agree: 1 – 5]
36: I was encouraged to think about ideas and solve problems. [Agree: 1 – 5]
37: I am confident of my ability to learn online. [Agree: 1 – 5]
UNIT PERFORMANCE

38: How well do you think you're doing in this unit as a whole? Please try to rate yourself objectively, based on any marks, grades or comments you have been given. 1 = Rather badly; 4 = Very well. [Rating: 1 – 4]

39: How satisfied have you been with this unit being offered wholly online? 1=LOW; 5=HIGH [Satisfaction: 1 – 5]

40: In what ways, if at all, has studying this unit online influenced your approach to learning? [Free text entry]

FINALLY…

Please enter any comments or suggestions you feel are relevant. [Free text entry]