

The Virtual Learning Environment: Student Use and Perceptions of its Usefulness

Paul Wells
Faculty of Business
Auckland University of Technology
New Zealand
Paul.wells@aut.ac.nz

Peter Fieger
College of Humanities and
Social Sciences
Massey University
New Zealand

Paul de Lange
School of Accounting
And Law
RMIT University
Australia

Introduction

The rapid acceptance of and changes in information technology has meant that the pedagogical benefit of incorporating new technologies into subject delivery is not well understood and the non-discipline specific findings are inconclusive (Bonner, 1999; Brace-Govan & Clulow, 2000; Reeves, 1997; Smeaton & Keogh, 1999). Even though some studies have reported that improved learning outcomes result from heightened motivation and extended mental effort (Bryant & Hunton, 2000; Kember, 1995; Koh & Koh, 1999; Kozma, 1991), Ramsey (2003) concludes that the impact and use of technology on learning outcomes for students and faculty are not well understood. That this issue has not been well examined in the accounting literature (Bryant & Hunton, 2000) provides the motivation for this study to investigate how students utilise a Virtual Learning Environment (VLE) and second to identify student perceptions of its usefulness.

Project Aims

This study seeks to provide a platform for evaluating the pedagogical effectiveness of an accounting VLE by first ascertaining how students utilise this learning tool and second identifying student perception of the VLE as a learning tool. To identify the determinants of this perception we examined the effect of five variables - namely the provision of lecture notes, discussion forums, self-tests, announcements and other tools (email and www links) on overall perception of the VLE by students in a New Zealand University.

Method

The survey instrument was administered in a second year Accounting Information Systems and Auditing course, during formally scheduled class times, in the tenth teaching week of semester two, 2003 and semesters one and two of 2004. The students were asked to provide responses on the basis of their experience in the Accounting Information Systems component of the course.

Respondents were asked to evaluate the usefulness of the VLE for the provision of lecture notes, discussion forums, formative self-testing, announcements and other tools. They were also invited to provide to an overall evaluation. In addition to a range of Likert style questions for each section, respondents were given the opportunity to make 'additional comments' at the conclusion of these questions.

From a total of 206 enrolled students there were 166 respondents providing an overall response rate of 81%. Seventy-nine respondents provided their student identification number. The mean and standard deviation of the assessment results for this group were 67.7% and 8.5 respectively while the mean and standard deviation for the entire population was 64.7% and 12.9.

Insert Table 1 about here

A demographic profile of the respondents is reported in table 1. Seventy-three percent of respondents were female, twenty-three percent were part-time students and 88% of respondents were under 30 years of age. The high number of female respondents reflected the high proportion (70%) of female enrolments in the course.

VLE Usage

During semester 2, 2003, 59 of the 69 students enrolled in this course made 20164 hits on this VLE site. The most popular application was the content area which recorded 35% of the hits followed by the discussion board (28%) and announcements (14%). While there was a total of 4730 hits on the discussion board these were directed at a mere 34 messages. This suggests that students prefer to monitor rather than actively participate in class activity in the VLE even with the added option of anonymity in the discussion forums. An analysis of all application hits is presented in figure 1.

Insert Figure 1 about here

Access to the site was evenly distributed during the week-days with access declining by more than 50% during the weekends, thus suggesting that students complete most of their study during the period Monday to Friday. It is surprising that only 12% of accesses were made at the weekend when 26% of respondents were part-time students. Anecdotal evidence reported in a respondent's additional comments suggests that many of the part-time students printed out material at work rather than at home. The number of hits per day is illustrated in figure 2.

Insert figure 2 about here

Eighty-one percent of hits are made on the site between 8am and 7pm. Again this is surprising given the number of part-time students and raises the question as to when part-time students actually undertake self-directed learning. The number of hits made each hour is illustrated in figure 3.

Insert figure 3 about here

Data Analysis

Data analysis proceeded through two stages. First, exploratory factor analysis was undertaken on each of the six sections of the instrument to reduce the number of items to a workable number of factors (Tabachnick & Fidell, 1996). Second, regression analysis was conducted utilising the factors derived from the factor analysis in order to determine their relationship with the overall perception of students utilising the VLE.

The dimensionality of the items in the survey instrument was explored using principal component analysis and the factors *availability of lecture notes*, *usefulness of lecture notes*, *discussion forum*, *self-tests usefulness*, *self-test use*, *announcements* and *‘other tools* along with *overall perception* which became the dependent variable were identified and extracted for subsequent regression analysis. *Other tools* referred to the availability of www links and the availability of email contact (including address books) with teaching faculty and other students.

Of particular note is that three sections of the survey instrument, *lecture notes*, *self-test* and *overall perception* resulted in two component extractions. In the ‘lecture notes’ section three questions specifically sought information relating to the availability of these notes while two questions sought to ascertain whether the availability of the notes detracted from student learning and participation in the course. While respondents endorsed the availability of lecture notes on-line, they did not believe that this acted as a distraction from class attendance or attentiveness.

Insert table 2 about here

The analysis of the reliability of the extracted factor variables yielded a satisfactory Cronbach’s Alpha value of 0.68. The Cronbach alpha values, if the item was deleted, as well as the inter-item correlations, are shown in table 2. This shows a satisfactory alpha value across all variables, although the omission of “self-test use” variable would have improved the consistency of the items in the questionnaire.

In the self-test section three questions related to the usefulness of the self-tests and whether they should count towards the final result for the course while the remaining question related to the extent to which students used the self-tests. The respondents believed the tests were useful and that they should be made available, although this did not automatically mean that they would use them or that they should count towards the final mark.

In the summary section five questions related to overall perceptions of the VLE as a useful learning tool. The mean score for the factor *overall perception* of 2.171 with a confidence interval of 95% and an upper bound of 2.26 and lower bound of 2.08 indicates overwhelming support for the VLE used in this study.

Regression analysis was used to assess the relationships between the created seven independent variables (factors) and the overall perception (dependent variable). Table 3 shows the regression coefficients as well as R^2 and adjusted R^2 for the final graphic depiction.

The regression result shows that the seven selected factors explain slightly more than 50% of the variance in ‘overall perception’. The F value of 24.5 is statistically significant at the 99% level and confirms that the model expresses a meaningful relationship between the dependent variable and independent variables.

Insert table 3 about here

The beta coefficients in table 3 identify the strongest contributing predictors of the overall perception of the VLE as: ‘the availability of lecture notes’, ‘announcements’ and ‘other tools’. The quantified impact of these variables on the ‘overall perception’ is illustrated in figure 4.

Discussion

The results show that *availability of lecture notes*, *announcements* and *other tools* (*availability of www links and email contact*) made the strongest contribution to the students’ overall positive perception of the VLE.

Insert figure 4 about here

With an increasing number of students working while studying full time, student absence is often explained as employment related and involuntary. The provision of the VLE provides an opportunity for the students to “catch up” on missed classes. Interestingly the students did not believe that the *availability of lecture notes* resulted in them being less interested in attending classes. This was further endorsed by a number of students in their additional comments who stated that the VLE “... should not replace the physical classroom”. These findings are consistent with those of Kenny (2003) and Oliver (2000). This and the “catch-up” activity may explain why all three factors which contributed to the positive overall perception of the VLE involved one-way rather than interactive communication. The preference for one-way rather than interactive communication is also consistent with prior research findings (Beard & Harper, 2002; Breen et al., 2003; Lindner & Murphy, 2001). Linder & Murphy (2001) found that students’ reluctance to participate in interactive communication arose in part due to the absence of any assessment relating to the activity. This study supports that finding, however the instructor required all questions relating to assessment to be directed through a discussion forum – this is in part the reason for the high hit rate on the discussion forums.

The availability of lecture notes as a significant factor is not surprising given that 35% of all hits on the VLE related to the content area. Surprisingly the usefulness and availability of discussion forums was not considered a significantly positive feature by the respondents and yet this feature accounted for 28% of the hits on the VLE. On the other hand respondents found *announcements* and *other tools* contributed positively to their perception of the VLE while attracting only 14% and 3% of the hits respectively.

Two VLE-related problems identified in previous research were, access to sites and staying connected, and computer and internet literacy (Beard & Harper, 2002; Lindner & Murphy, 2001; Siragusa, 2002). Neither of these issues were considered a problem for the students surveyed in this study and hence the results relating to this question were eliminated from the study. One possible explanation relating to internet and computer literacy is that most students had used VLE's in previous courses.

Conclusion

Overall the results of this study show high levels of student satisfaction with the availability of and learning support provided by a VLE, and suggest that this should be made available in other courses. However the unwillingness of students to participate in two-way on-line activities does prevent educators from realising the full potential of the on-line learning technology.

REFERENCES

- Beard, L. A., & Harper, C. (2002). Student Perceptions of Online Versus On Campus Instruction. *Education*, 122(4), 658-663.
- Bonner, S. E. (1999). Choosing teaching methods based on learning objectives: An integrative framework. *Issues in Accounting Education*, 14(1), 11-39.
- Brace-Govan, J., & Clulow, V. (2000). Varying expectations of online students and the implications for teachers: Findings from a journal study. *Distance Education*, 21(1), 118.
- Breen, L., Cohen, L., & Chang, P. (2003). *Teaching and learning online for the first time: Student and coordinator perspectives*. Paper presented at the Partners in Learning: 12th Annual Teaching Learning Forum, Edith Cowan University, Perth.
- Bryant, S. M., & Hunton, J. E. (2000). The use of technology in the delivery of instruction: Implications for accounting educators and education researchers. *Issues in Accounting Education*, 15(1), 129.
- Kember, D. (1995). *Open learning courses for adults: A model of student progress*. New Jersey: Englewood Cliffs: Educational Technology Publications.
- Kenny, J. (2003, March 2003). *Student perceptions of the use of online learning technology in their courses*, from <http://utilbase.rmit.edu.au/Articles/march03/kenny1.htm>
- Koh, Y. K., & Koh, C. H. (1999). The determinants of performance in an accountancy degree programme. *Accounting Education*, 8(1), 13-29.
- Kozma, R. B. (1991). Learning with media. *Review of Educational Research*(Summer), 179-211.
- Lindner, J. R., & Murphy, T. H. (2001). Student perceptions of WebCT in a web-supported instructional environment: Distance education technologies for the classroom. *Journal of Applied Communication*, 85(4), 36-47.
- Oliver, R. (2000). *When teaching meets learning: design principles and strategies for Web-based learning environments that support knowledge construction*. Paper presented at the 17th Annual ASCILITE Conference, Lismore, NSW.
- Ramsey, C. (2003). Using virtual learning environments to facilitate new learning relationships. *International Journal of Management Education*, 3(2), 31-41.
- Reeves, T. C. (1997). *Evaluating what really matters in computer-based education*, from <http://educationau.edu.au/archives/cp/reeves.htm>
- Siragusa, L. (2002). *Research into the effectiveness of online learning in higher education: Survey findings*. Paper presented at the 2002 West Australian Institute for Educational Research Forum, Edith Cowan University, Perth.
- Smeaton, A., & Keogh, G. (1999). An analysis of the use of virtual delivery in undergraduate lectures. *Computers in Education*, 32, 83-94.
- Tabachnick, B. G., & Fidell, L. S. (1996). *Using Multivariate Statistics* (2nd ed.). New York: Harper Collins.

Table 1: Respondent Demographics	
Respondents	n=166
Gender	
Male	27%
Female	73%
Age	
< 18	1%
18 - 21	43%
22 - 29	44%
30 - 39	10%
> 39	2%
Full-time/Part-time	
Full-time	77%
Part-time	23%

Figure 1: Hits by application

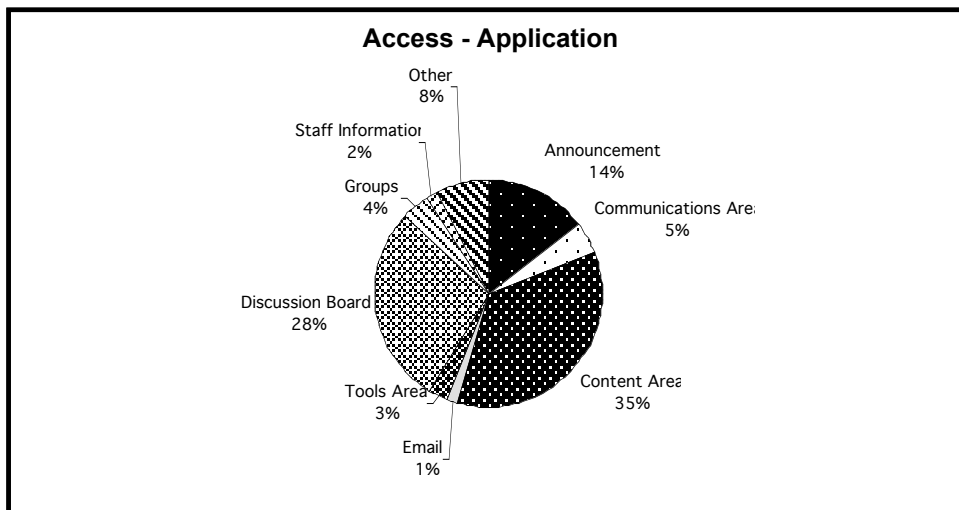


Figure 2: Hits by day of the week.

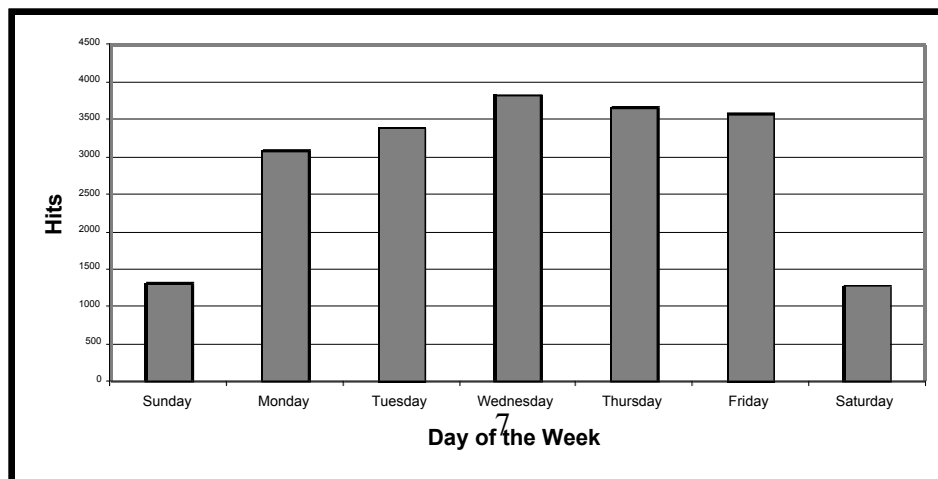


Figure 3: Hits by hour of the day

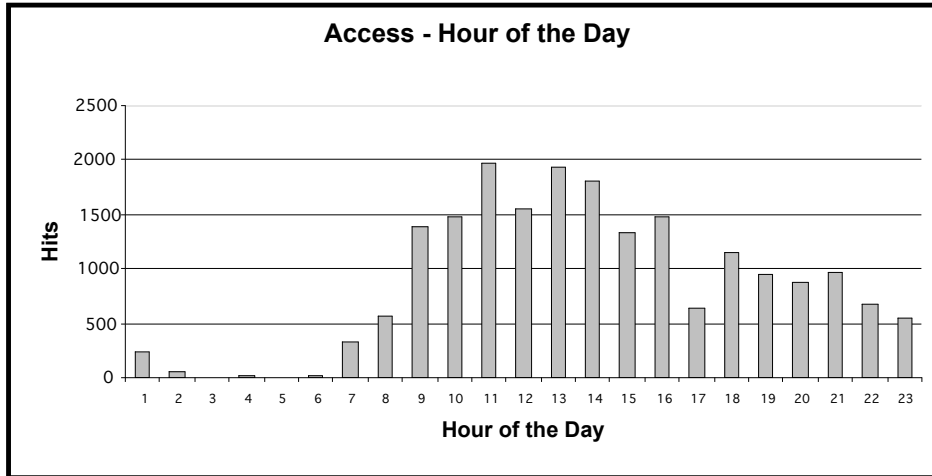


Table 2: Inter-item Correlations

	Lecture Notes (Avail)	Lecture Notes (Use)	Discussion forums	Self Test (Usefulness)	Self Test (Use)	Announcements	Other Tools	Overall Perception	deleted
Lecture Notes (Avail)	1.000	0.001	0.445	0.224	-0.235	0.314	0.272	0.568	0.635
Lecture Notes (Use)	0.001	1.000	0.152	0.144	0.086	0.033	0.141	0.119	0.693
Discussion Forums	0.445	0.152	1.000	0.373	-0.149	0.369	0.479	0.503	0.592
Self Test (Usefulness)	0.224	0.144	0.373	1.000	-0.003	0.233	0.283	0.333	0.636
Self Test (Use)	-0.235	0.086	-0.149	-0.003	1.000	-0.002	-0.106	-0.187	0.753
Announcements	0.314	0.033	0.369	0.233	-0.002	1.000	0.267	0.487	0.619
Other Tools	0.272	0.141	0.479	0.283	-0.106	0.267	1.000	0.522	0.615
Overall Perception	0.568	0.119	0.503	0.333	-0.187	0.487	0.522	1.000	0.578

Table 3: Regression Coefficients

	Standardised Coefficients		
	<u>Beta</u>	<u>t</u>	<u>Sig</u>
(Constant)		-.007	.994
Lecture Notes (availability)	.306	4.642	.000***
Lecture Notes (usefulness)	.066	1.149	.252
Discussion Forums	.119	1.634	.105
Self-Test (usefulness)	.101	1.634	.104
Self-Test (use)	-.079	-1.335	.184
Announcements	.216	3.403	.001***
Other Tools	.274	4.172	.000***
F Value	24.459		.000***
R ²	.541		
Adjusted R ²	.519		

*p=<.10

**p=<.05

***p=<.01

Figure 4: Key predictors of overall perception



