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# The Agency of Innovation: Subject Websites, their Perceived Value and Student Performance

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*Andrew Field\**

*Ancora imparo<sup>1</sup>*

## Introduction

The innovations of the information revolution, computers, the Internet and other increasingly frequent signs that we are now living in the 21st century have given rise to novel observations in all fields of human activity. In the teaching of the law in university courses, this is no exception.

The observation which gave rise to the present article arose through the teaching of an introductory course of commercial law to business students during Semester 1 2002. The students who are presently enrolled in BTF1010 Commercial Law at Monash University, Australia, experience many features their predecessors of past generations would recognise in attending university. For example, students attend lectures and tutorials. However, they are also assisted in their studies by the provision

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1 "I am still learning" attributed to Michelangelo (1475–1564). The motto of Monash University: see <http://www.monash.edu.au/about/motto.html> (accessed 20 August 2003).

of a number of technological teaching and learning aids. For example, lectures are accompanied by a series of PowerPoint projections; copies of those overheads can be obtained prior to the lecture via a subject website on the Internet. Various other teaching materials such as past exam papers, tutorial questions, sample assignment questions and answers can also be obtained from the website. In other words, the personal computer and its attachments are ubiquitous.

The relevant observation concerned a student who five weeks into semester was identified as answering a greater proportion of questions in a 20-student tutorial class and who had an above average command of the material being studied and discussed than her classmates. That observation alone was not exceptional. However, a further observation derived from an in-built counter on the subject website (or “unit” as they are called at Monash University) that keeps a tally of the times students access pages on the unit website, noted that this particular student had accessed the website<sup>2</sup> more than 150 times. In the teaching of Commercial Law, the WebCT site is used mainly as a course materials delivery platform. Thus, in view of the fact that the students would probably have only needed to access the site to download the unit tutorial questions book, the unit outline and five weeks of lecture notes, this figure appeared staggering. In fact, *prima facie* it was a figure four times what appeared to be the average of over 500 students enrolled in the unit. This observation posed in the author’s mind the question as to whether there was a correlation between the frequency of student access to the WebCT site and a student’s final performance in the unit, as represented by their final grade. Thus posed the hypothesis – that better performing students access the Commercial Law WebCT page more frequently than other students.

The realisation that this hypothesis had not been tested for this unit, which was one of the first to adopt WebCT at Monash University in 1999, and that there was little evidence of student use or appreciation of the teaching tool, gave rise to another question. The question was premised upon a smouldering debate between those academic staff who expend many hours in the preparation and maintenance of electronic aids, including PowerPoint slides, and those staff who dismiss such aids as either unnecessary or exercises in “spoon feeding”

2 Or “WebCT site” – described as such after the name of the company which provides the software. There are many other software packages which can perform the same tasks as those discussed here. WebCT simply happened to be the platform adopted by Monash University. Further information can be obtained from the manufacturer’s own website at <http://www.webct.com>.

students. Is the “Luddite” element of Academia correct to scoff at such “gadgets”?<sup>3</sup> Therefore, the question was whether there was real value in using WebCT as measured in terms of correlations between student performance and frequency of WebCT access or in terms of the students’ own perceptions.

The study, which formed the basis of this article, was concerned with addressing these two questions. The article commences in “Developments in Teaching Technologies”, below, by arguing that the realities of modern lecturing and teaching in a university require an ability to embrace change.

Of course, not all change is positive. Not all innovations live up to the claims made in their favour. Hence, despite the claims that have been made regarding the strengths of WebCT as a teaching aid, the present examination was considered necessary. As a vast literature already exists questioning the effect of teaching technologies on student performance,<sup>4</sup> the value of the technology had to be assessed in terms of its use – even merely the volume of its use by students, and conscientious students in particular. As discussed in “Justification: Comparability of Studies of Teaching Tools Experiences in Other Contexts”, prior studies have been made regarding student use of WebCT and its effect on student performance. However, these studies did not concern a sample of students as large as that enrolled in Commercial Law or which used WebCT as a materials delivery system for an on-campus face-to-face law subject.

The raw material that forms the basis of the conclusions in this article is presented in “Testing Groundwork Assumptions: Questionnaire Results” and “WebCT Use: Computer Generated Evidence”. “Testing Groundwork Assumptions: Questionnaire Results” presents information derived from a questionnaire administered to a sample of students to confirm previous assumptions concerning student use of computers, the Internet and specifically the subject website. This was important to gain an understanding of student perceptions and the validity of those perceptions. Finally, “WebCT Use: Computer Generated Evidence” presents the electronically

3 Fortunately, at the time of writing, the author has not actually seen any examples of lecturers repeating the actions of the original “Luddites”, who were members of the new English working class who, in the early 1800s set about breaking machines which they saw as making their own skills obsolete, and causing their wages to plunge. They took their name from their leader Ned Ludd. See A Briggs, *The Age of Improvement 1783-1867* (London: Longman, 1979) 182.

4 See discussion in Conclusion below.

generated evidence of student use of WebCT and identifies the evident trends.

## Developments in Teaching Technologies

### *Socrates and the Modern Lecture Theatre*

It has been said that “change is constant”.<sup>5</sup> This should apply in teaching methods as in other areas of human activity.

Undoubtedly, the electronic technologies developed to assist teachers have made an overt and immediately apparent impact over the last 50 years. Indeed, they probably represent the most important development in the history of education after the invention of the printing press in the 15th century.<sup>6</sup> Their impact can be seen from the introduction of audio amplification, mass photocopying for the provision of handouts to the introduction of overhead projectors and into the age of the Internet with the ability to create websites devoted to a university subject, filled with information ready for instant dissemination to a large number of students. For all teachers, the impact of these changes has been manifold and positive. However, there are also drawbacks, particularly in terms of time use. The reality is that it takes extra time to convert a prepared lecture into a series of overhead slides to display in lectures, to maintain a website or even to prepare copious amounts of photocopied handouts to distribute to students. Are these technologies necessary?

One topic of conversation that is probably a favourite in many university staff common rooms is to opine about the merits of the “Socratic” method of teaching. The Socratic method of teaching is premised on an argumentative discourse between the teacher and the student dating back 2,000 years; hence it is free of technology and may be used as a basis for refusing to adopt new teaching technologies.<sup>7</sup>

5 “Change is inevitable in a progressive country. Change is constant”, stated Benjamin Disraeli (1804–1881), British Prime Minister, speaking at Edinburgh in relation to the passing of the second *Reform Act* which increased the electoral franchise in Great Britain: *The Times* (30 October 1867).

6 John Man identified the coming of the Internet as the “fourth revolution” or turning point in 5,000 years of “human contact” (meaning communication). He identified the first as the invention of writing; the second as the invention of the alphabet; and the third as the invention of printing: J Man, *The Gutenberg Revolution* (London: Review, 2002) 1.

7 The author has heard senior staff describe the adoption of some of the technological teaching aids discussed in this article as “spoon feeding”, preferring to lecture with little more than a textbook at hand and a microphone amplification as the only concessions to the modern age of lecturing over 100 students at a time.

However, lecturers who cite Socrates as a reason to lecture with only “chalk and talk” (frequently without the chalk) to a lecture theatre filled with over a hundred students, where there is little hope for discussion with full group participation, misunderstand Socrates. Socrates’ views on teaching through argumentative discourse were expressed as follows:

I am sterile of wisdom, and the reproach that has often been made against me, that I ask questions of others, but never answer any by any chance myself, because I have nothing wise to say, is a true reproach. And the cause of it is this: it is divinely ordained that I should help others to bring forth, but bring forth nothing myself. I am, then, myself no such prodigy of wisdom nor can I point to any great invention, born of my soul: but those who pass their time with me, though at first they seem, some of them quite unintelligent, nevertheless in my company all, as time goes on, all to whom heaven is kind, progress amazingly – or so it seems to them and to others. And all the while it is clear that they have never learnt anything from me, but have discovered for themselves in their own minds treasures for their possession.<sup>8</sup>

Clearly, Socrates was outlining a teaching method used with a small number of students, whereby in focused discussion with them, he would challenge and cajole them into thinking out matters and discovering conclusions for themselves. This method is invoked by teachers in many disciplines when dealing with students, whether “one on one” or when student numbers are low. Thus, it is not difficult to imagine the Greek teacher with a small group of students engaged in debate. Crucially, it is clear that the teacher was giving individual attention to the students and guiding their intellectual progress. It is the teaching practice frequently pursued in classes with very small numbers or in tutorial groups with less than 20 students. Certainly, the Socratic goal to encourage students to make their own discoveries remains.

However, the modern reality of lecturing to groups in lecture theatres with seating for 350 students is clearly a different matter to the Socratic ideal. There can be no pretence of individual attention being given to each student and any lecturer who attempted to argue to the contrary should be

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8 Socrates in conversation with Theaetetus, quoted in H F Carlill, *The Theaetetus and Philebus of Plato* (London: Macmillan, 1906) 148–151, reproduced in John Ferguson (ed), *Socrates: A Source Book* (London: Macmillan, 1970) 101.

challenged to identify by name all of the students in such a class from memory.

### *Teaching Technologies Employed in Teaching BTF1010 Commercial Law*

Commercial Law is a core unit in the various Bachelor of Business degrees offered by the Faculty of Business and Economics at Monash University. This alone means that student numbers are high. Each year the unit has a total enrolment of approximately 1,000 students. The topics include contract law, negligence, liability for misrepresentations, the provisions of the *Trade Practices Act 1974* (Australia) which relate to these areas, agency, partnerships and an introduction to company law. Students' performances are assessed on the basis of two tasks. First, they are required to submit a 2,500-word assignment worth 30% of the final mark, including a headnote of a Supreme Court judgment and advice for a legal dispute for which the facts are provided. The second portion of the assessment is a three-hour end-of-semester examination.

The unit is taught over 13 weeks with a weekly two-hour lecture and a one-hour tutorial. For the tutorial groups, the techniques of a past millennium are no doubt as appropriate as ever they were. However, for the lectures that are delivered to hundreds of students simultaneously, it would be short-sighted to ignore modern teaching tools.

Some years back in the teaching of this unit, the techniques of "talk and chalk" were enhanced by the use of tools such as A4 plastic transparencies of notes and images that could be projected onto screens by overhead projectors. The introduction of the Microsoft PowerPoint software package allowed the creation of overheads with a very polished and professional appearance.

At some point in the 1990s, copies of these PowerPoint images could be accessed by students from university Internet sites, placed there by the university information technology staff at the request of the lecturer. This practice alone had two clear benefits. First, it provided students with a clear guide to the lecture. Secondly, it recognised that an increasingly larger portion of students at Australian universities were from non-English-speaking backgrounds. It meant that if the students could not follow the lecture then at least the written presentation allowed the students to take *something* out of the lecture. However, this process of uploading the images did take time on account of the multitude of such requests

and bureaucratic obstacles, rather than flaws with the actual technology. This time delay reduced the effectiveness of the tool. The only way to counter this time lag was to have the lecture written weeks ahead of time, thereby removing the lecturer's flexibility in teaching.

Since 1999 the teaching staff at Monash University have utilised the Internet and a unit-specific website, loaded onto the Internet via software provided by WebCT to assist in the teaching of the unit. The chief advantage of this system is that the software is simple enough to operate to enable the individual lecturer to control the material placed on the website without time delays. Accordingly, the Commercial Law WebCT site is essentially a materials delivery system, enabling mass delivery of materials to students within minutes of its creation. Generally, the materials placed there include:

- the unit outline;
- the unit tutorial book;
- copies of lecture overheads, placed on the site the week before the lecture for students to download and bring with them to lectures;
- the assignment questions set for the unit;
- an unreported appeal court judgment for which students will write a headnote as part of their assignment;
- past exam papers; and
- various links to law research sites and other study sites.

A further important advantage of the software is that access is only allowed to the site to designated users such as the students whose details, usernames and passwords are loaded at the start of semester. In short, the lecturer's and the university's intellectual property is at least partly protected as only enrolled students have access to the site.

In the early days of WebCT use in Commercial Law, the website was often used as a demonstration model in the university for other lecturers seeking to employ the software in their teaching.<sup>9</sup> The opinions gained from such examinations of the system were such that its use has spread throughout Monash University and it is now the preferred Internet support platform for the delivery of materials,<sup>10</sup> as well as

9 Viva voce evidence from Mr Brendan Sweeney, Lecturer in Charge of Commercial Law, in conversation with the author, about August 2002.

10 The evidence shows that it was sometimes an uphill battle to persuade teaching staff to examine the system. One communication from a proponent stated: "I am only suggesting you try a piece of a few cakes before buying any". Private email from the Flexible Teaching Consultant/Web Designer,



for other applications.<sup>11</sup> However, even in the teaching of commercial law in the five years since WebCT was introduced, there has been no study conducted to assess its value, whether as determined by students or as ascertained through their performance in the unit as reflected in their final marks. Hence, the present study, prompted by the observations noted above, but also justified by the lack of rudimentary information of this kind obtained in the teaching of this specific unit.

### Justification: Comparability of Studies of Teaching Tools Experiences in Other Contexts

It might be argued that even if no survey had ever been made of WebCT use in BTF1010 Commercial Law, there should nevertheless be comparable studies in other similar law subjects. If there are such studies, does the present study have real merit or novelty?

The use of subject websites and information technologies has been quite common now for at least the last five years. Although over those years, there has been a great deal of discussion about the uses to be made of electronic media and the Internet specifically in the provision of university courses, the majority of such discussions and studies have been based in the wholesale provision of university courses “online”.<sup>12</sup> Similarly, as to studies specifically devoted to the uses of WebCT that might be comparable, they are not ideal in the present context. They can be distinguished from the present study in at least three different ways.

First, there are those claims based on the use of WebCT to provide courses entirely online. For example, the study by Yunfei Du and Carol Simpson on the “Effects of Learning Styles and Class Participation on Student’s Enjoyment Level in

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Technology Services Group, Faculty of Business and Economics Monash University, to the Manager of Web and Internet Facilities, Information Technology Services, Monash University, dated 19 September 2000.

- 11 Other applications of the WebCT package not utilised in BTF1010 Commercial Law have been utilised in other units. These tools include tools for receiving assignment answers submitted by students, email facilities, bulletin boards, and discussion sites.
- 12 For an interesting discussion of the various arguments for and against the virtues of “online learning”, see “The Digital Degree”, produced by Joe Gelonesi, a radio news report broadcast on *Background Briefing*, ABC Radio National (Sunday 20 January 2002), transcript available at <http://www.abc.net.au/rn/talks/bbing/stories/s444980.htm>. See also C Allport, “Educating and Organising Globally: Perspectives on the Internet and Higher Education” (2001) (1 & 2) *Australian Universities Review* 44 at 21 for a discussion on the “virtual university” which examines some of the extreme arguments on this issue.

Distributed Learning Environments” has certain similarities with the present study. It used a student sample of a large class of 169 students. It based its findings on information gained via the WebCT software to determine how often students were using the site and how this corresponded to their final performance. However, the course being studied was different from the subject of the present study as it was entirely online and WebCT was being used as more than a materials delivery system. If the students did not participate, then they could not perform well in the subject.<sup>13</sup>

Secondly, there are those studies whose evidence was derived from classes with enrolments far below the 500 students that form the basis of the present study. For example, in a study on the use of WebCT in a journalism course, Jeffrey Merron wrote the following:

During this class, a student wrote to me, “I have discovered something about this medium that I had never noticed before. I have found that the bulletin board environment is more conducive to learning and discussion than any environment that I’ve been exposed to, including video, chat, and the traditional classroom setting. It allows students to interact in an intelligent, organized, and logical manner. We can enter at our leisure, contemplate the issues discussed, and develop a thoughtful experience.”

I received this unsolicited and unexpected comment about a third of the way through a summer class in 1998. The student, a Business Information Systems major taking one of his last classes before end-of-summer graduation, wrote this without conceivable motive: He was not a journalism major, I had never met him face-to-face, his grade for the class would have little significance on his academic record. The only rationale I could think of for this comment was: This student was excited about learning. Five years of student comments on classes had never turned up a gem like this one. What had I done?

I taught an online class.<sup>14</sup>

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- 13 Y Du and C Simpson, “Effects of Learning Styles and Class Participation on Students’ Enjoyment Level in Distributed Learning Environments”, Paper presented at the *Annual Conference of the Association for Library and Information Science Education Association* (New Orleans: LA, January 2004), 15-18.
- 14 J L Merron, “Managing a Web-based Literature Course for Undergraduates” (Winter 1998) (1)4 *Online Journal of Distance Education*: <http://www.westga.edu/~distance/jwin14.html>.

What follows is a discussion of a series of findings (“seven factors”) which contributed to success. Within their limits these findings are probably useful. Merron describes them as having helped him along the road to Damascus. However, the limits on the study and the feature that makes it less than entirely useful for a comparison with the present study is that Merron’s class sample had only 16 students.

Similarly, a further study from closer to home by Jennifer Curtin of Monash University discusses WebCT and online tutorials and, specifically, the uses of a bulletin board. However, Dr Curtin’s study sample class comprised only 14 students<sup>15</sup> and it might be asked whether the benefits found in such a small group would be so apparent with 1,000 students per year.

These two studies illustrate the possibilities and use of WebCT. They are useful contributions to the general experience being generated of WebCT and contribute to the general pool of information. However, as to their bearing on the broader questions being discussed in the present study, the link between student performance and their use of WebCT, the value of the two studies is minor and not necessarily helpful. For producing a general test of such a hypothesis, these two studies dealt with too small a sample of students.

The third difficulty with other studies concerns the manner in which their conclusions were derived and the level of empirical supporting evidence. Some studies do address the use of WebCT as a materials delivery system, and also are based on the practices of large numbers of students. What might also appear initially pleasing in the context of the present study is that some of these studies *do* appear to be consistent with the hypothesis of the present study. For example, in a course entitled “Principles of Technological Change” conducted at Texas A & M University with an enrolment of 111 students, Tim Murphy and James Linder found that student use of WebCT did “contribute to student success”. The success was hampered only when “students do not have easy access to reliable computers”.<sup>16</sup> Similarly, Debra Henley and Athol Reid in a study of student usage of WebCT in a Metabolism and

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15 J Curtin, “WebCT and Online Tutorials: New Possibilities for Student Interaction (2002) 1 *Australian Journal of Educational Technology* 110-126; see <http://www.ascilite.org.au/ajet/ajet18/curtin.html>.

16 T Murphy and J Linder, “Building and Supporting Online Learning Environments Through Web Course Tools: It is Whippy, But Does it Work?”, paper presented at the *Annual Meeting of the Southern Association of Agricultural Scientists: Agricultural Communications Section* (2001), full text available at <http://agnews.tamu.edu/saas/Murphy.htm>.

Nutrition class found that student use of the subject site was high and that those students who achieved higher final marks accessed the WebCT site on average three times more often than other students.<sup>17</sup>

Similar results have been obtained in the business discipline. Anthony Basile and Jill D'Aquila analysed the use of WebCT in an accounting course of 128 students. They found that there was a positive response to the use of WebCT among their students and these students felt that they benefited from having such electronic resources.<sup>18</sup>

These studies are not exactly comparable with the present study, as when "student success" is described, it appears that these studies are registering *students' own perceptions* of success. Indeed, in each of these studies, the results were based on student surveys. The findings of those studies are perhaps comparable with the results of the questionnaire that was used in the present study (discussed below), although that questionnaire was anonymous and did not ask the students to rate their "success". However, they do not closely bear comparison with the empirical evidence that formed the basis of the findings of this study.

In discussing notions of successful student performance, the present study arguably has greater credibility than those studies referred to since a student's "success" is not equated with the students' own perceptions, but rather it is based on the students' final marks received for the unit. Their use of the WebCT site is not based on their own perceptions of how often they use the WebCT (although this information was obtained in the questionnaire discussed below) but rather on the electronically generated material.

## Testing Groundwork Assumptions: Questionnaire Results

The value of the study appeared to be established. However, it was also apparent that there were certain other matters that would need to be considered before the study would carry any weight.

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17 D Henley and A Reid, "Use of the Web to Provide Learning Support for a Large Metabolism and Nutrition Class" (2001) 29 *Biochemistry and Molecular Biology Education*.

18 A Basile and JD'Aquila, "An Experimental Analysis of Computer-Mediated Instruction and Student Attitudes in a Principles of Financial Accounting Course" (2002) *Journal of Education and Business* 137 at 137-143.

### *Student Access to Computers and the Internet*

The most basic assumption adopted by universities in Australia in their implementation of information technologies, personal computers and the Internet as a means of communicating with students is that all students have access to these technologies. It is a matter that needs to be tested. The value of the WebCT site is only relevant to all students if all students have access to it. Regardless of how useful the technology is as a teaching aid, if a substantial portion of students cannot physically access it, then a lecturer's efforts in developing and maintaining such aids are wasted. Of more importance to the present study, if large numbers of students do not have access to the WebCT site then it is incorrect to make general statements regarding trends arising from student use of WebCT.

The Australian National Office of the Information Economy (NOIE) in its April 2002 report, *The Current State of Play: Australia's Scorecard*,<sup>19</sup> noted that although 67% of Australian households owned a computer, only 49% of households were connected to the Internet. To say the least, such figures do not bode well for a university course that utilises the Internet for the delivery of a large portion of its materials. However, these figures arguably did not take into account such matters as a possibly higher percentage of home Internet connections, which might prevail in the residences of university students as opposed to general Australian households. It also did not take into account possibilities of student access to the Internet in other places such as at the university or at places of employment. Accordingly, to test these matters it was determined that an anonymous questionnaire would be administered to a sample of 100 of the commercial law students.

Students were asked: "Other than at University, do you have a computer which you can use with an internet connection?" This question was deliberately phrased with reference to university access since it has been suggested that all students have access to a computer as the university provides computer labs.<sup>20</sup> Yet, anecdotal evidence of student comments has indicated that frequently there were no computers available at the university

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19 National Office of the Information Economy, *The Current State of Play: Australia's Scorecard* (Canberra: National Office of the Information Economy, April 2002) obtained at <http://www.noie.gov.au> (accessed on 29 October 2002).

20 For example: "Computers: Computers are an important aspect of university life. If you don't have your own computer, there are computer facilities at all Monash campuses providing student access to word processing, the Internet and email. Dial-in Internet access from home is also available to all enrolled students": *Monash University International Undergraduate Course Guide* (2003) 20.

because demand outstripped availability. Thus it seemed an important matter to determine whether students could access a computer elsewhere. Fortunately, the students' responses indicated that generally students did have access to computers elsewhere. The responses to this question were as follows:<sup>21</sup>

- At home 90
- At work 13
- Other 5
- Two students wrote in the word "no" even though the choice was not offered.<sup>22</sup>

Accordingly, it was a safe and accurate assumption that virtually all students had access to a computer connected to the Internet through which they could access the WebCT page.

Further responses to related questions also indicated a degree of ease with which students were able to access the Internet and the WebCT page, although not through the efforts of the university's computer buying program but rather through students' own resources. This is illustrated by the following three questions and their responses:

- 1 To what extent do you have difficulty accessing a computer?
  - Greatly 5
  - Often 5
  - Sometimes 41
  - Not at all 48
- 2 Where do you most often access a computer for study/research purposes:
  - At university 17
  - At home 83
  - Other 3
- 3 To what extent do you find cost discourages you from accessing a computer?
  - Greatly 1
  - Often 5
  - Sometimes 41
  - Not at all 52
  - No response 1<sup>23</sup>

21 As is apparent from the figures, students were permitted to give more than one response, explaining why the tallied figures total more than 100.

22 In light of this situation, copies of course materials and lecture overheads were placed on Reserve in the University Library for the use of these students.

4 To what extent do you often visit the university *only* to access computers?

- Greatly 1
- Often 9
- Sometimes 32
- Not at all 55
- No response 1

This information appeared to indicate that students generally have access to the Internet. Therefore, it would be safe to draw certain conclusions regarding a student's use of the Internet on the basis that all students had similar opportunities without a large number of students labouring under a special disadvantage related to computer access.

### *Student Perceptions of the Value of the Provision of Materials on Commercial Law WebCT Site*

It was also considered useful to determine how students used the WebCT site. Obviously, an underlying assumption to the hypothesis that better students accessed the WebCT site more often was that they were accessing certain types of material. The most obvious type of material to access on a weekly basis would be lecture notes as they were placed on the site week by week and were acquired on a similar basis. This assumption was confirmed with the following question and responses:

1 Generally, what is your usual reason for accessing the Commercial Law WebCT page?

- Download lecture notes 97
- Other 25<sup>24</sup>

Further, students confirmed that they appreciated the utility of having such notes provided prior to the lecture:

2 To what extent do you find it useful to have the lecture overheads provided before the lecture?

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23 The responses to the question "If any, what sorts of costs discourage you from accessing a computer?" indicated that students were conscious of computer cost. The responses were: transport costs (5); printing costs (55); internet access costs (27); other costs (4).

24 The "Other" responses were divided almost evenly between accessing the WebCT page to access tutorial problems assignment notes. It is significant to note that over the semester there was one assignment set. Although a complete book of tutorial questions to be used during the semester was placed on the WebCT page at the commencement of the semester, anecdotally students reported downloading the questions required for a particular weekly tutorial week by week.

- Very useful 70
- Useful 7
- Not useful 1
- No response 1

Students demonstrated that they had developed the habit of accessing the WebCT page to access these notes:

3 To what extent do you obtain a copy of the lecture overheads prior to attending a Commercial Law lecture?

- Always 81
- Generally 15
- About half the time 2
- Sometimes 1
- Never 1

On a further positive note that evidences the students' embrace of new teaching technologies, it was also ascertained that students prefer obtaining these lecture notes from the WebCT site rather than from other possible sources.

4 Generally, when you obtain a copy of the lecture overheads, from where do you obtain it?

- WebCT 90
- Library Reserve 7
- Friends 5

### *Students Perceptions of their Own Use of the Commercial Law WebCT Site*

It was clear that students over the course of the semester had developed a reliance on the WebCT site. There was clearly a habit developed during that time. The development of that habit would be empirically ascertained when the electronically generated tallies of student visits to the website were examined. However, even before that time, the questionnaire provided the opportunity to examine how the students reckoned the frequency of their own visits to the site. Hence the following questions and responses:

1 Generally, how often do you access the Commercial Law WebCT site?

- Every day 2
- Every second day 7
- Twice a week 42
- Once a week 48
- Less than once a week 1



Once again, the evidence from the students was that almost all of them were visiting the site at least once a week and over half of them twice a week. Leading the charge was a “hard core” of students who, if they did not visit the site every day, then did so every second day.

### *Confirmation of Student Appreciation of the Commercial Law WebCT Site*

One further matter that was addressed in the questionnaire was concerned with the students’ perceptions of the value of the WebCT site. As noted above, it was ascertained indirectly that students preferred obtaining lecture notes from the WebCT site rather than from the university library. Therefore, it was suggested that they appreciated the site. However, the following questions provided a more direct response to this issue:

1 Would you describe the Commercial Law WebCT site as very useful, adequate, or not very useful?

- Very useful 23
- Adequate 76
- Not very useful 1

The response indicated not merely that students embraced the technology but, based on the large number of “adequate” responses, many students would like to see the uses of the site expanded. Nevertheless, they considered what was on the site to be of value to their commercial law studies, as evidenced by the responses to the next question:

2 To what extent do you believe that you could complete Commercial Law without the WebCT site?

- Definitely 4
- Probably 23
- Perhaps 37
- Probably not 36

Thus, when it came to addressing the final question, “To what extent do you believe that the Commercial Law WebCT site should be retained?” the results were overwhelmingly favourable with over 80% of students endorsing retention of the site. The results were as follows:

- Strongly agree 37
- Agree 48
- Don’t really care 7

- Not at all 4
- No response 2

Therefore, at this stage it might be ventured that the students' satisfaction with the use of a unit website as a delivery point for information to students has value at least in the perceptions of the students.

## WebCT Use: Computer Generated Evidence

### *Identifying and Testing the General Trend*

At all times, the WebCT program retains tallies of the number of times each individual has visited a page on the website, each visit being described as a "hit".<sup>25</sup> By tallying this information, one of the two questions raised in this article could be swiftly answered. The total number of visits to pages on the WebCT site could be compared with the students' final marks at the end of semester and it could be observed whether students who scored higher final marks accessed these pages more than other students. To determine general trends this could be achieved by simply determining the average number of hits recorded up to the end of semester by the students who scored a High Distinction.<sup>26</sup> The same would be done for the other mark grades.<sup>27</sup>

However, because the WebCT program does not perform such a process electronically, this meant that the figures would have to be entered manually onto an Excel spreadsheet, which could then be used to determine the averages. Thus, using this method the following average numbers of "hits" (or WebCT page visits) were recorded across grades for the thirteen week semester:

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25 This can be found under the "Student Tracking" function.

26 A mark of 80 or greater.

27 Distinction, 70–79; Credit, 60–69; Pass, 50–59; and fails 40–49. Students recording a final mark of less than 40 were not tallied as such students would include those who had withdrawn from the unit, discontinued the unit, or somehow remained on the system through some other administrative occurrence. For the purpose of the study, the presence or lack thereof is inconsequential as any trends should be apparent – or not as the case might be – across the remainder of the student body.

Table 1: Average total number of hits on Commercial Law WebCT site pages across grades

	<b>Total Hits</b>
High Distinctions	90
Distinctions	84
Credits	76
Passes	75
Fails (40-49)	61

The difference between successive grades is not great, although there is a noticeable trend. The difference between the High Distinction students and bare Pass/Fail students is relatively pronounced. The most successful students did appear to be using the WebCT site and were more active on that site than the Pass and Fail students. Accordingly, on this rather simplistic basis the hypothesis posed appears to have been borne out.

However, the rule of the hypothesis in isolation does not provide useful lessons with which to instruct students. Despite the trend, it does not follow that a student who accessed the WebCT page will automatically achieve a final mark of a High Distinction.<sup>28</sup>

### *Explaining the Trend: How the WebCT Page Was Used*

An explanation as to why the High Distinction students' frequent use of the WebCT site contributed to their success was to examine *how* they used the page. Within the terms of the present study and the evidence obtained, this meant examining whether there were any trends revealing peaks in use of the WebCT site at any points during the semester.

It was considered useful to see if any trends could be observed between student use at three-week intervals. Unfortunately, although the WebCT system keeps a cumulative tally for each student, it does not keep a progressive record of visits at certain intervals. Hence, if a student's record was examined on the WebCT hit counter in the exam week, the only information which would be available would be the total number of hits. Accordingly, to record the progressive tallies for weeks 6, 9, 12 and during the exam week, it was necessary to print out the figures for the 506 students at those three-weekly intervals, then manually load them onto the Excel spreadsheet.<sup>29</sup> This resulted in the manual loading of over 2,000 figures.

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<sup>28</sup> The student who recorded the highest number of hits (271) scored a pass mark of 57.

The result was that for each of the students a cumulative figure was recorded of how many visits to the pages on the WebCT site on four particular dates. For example, for one student who finished with a final mark of 81 the entries were recorded as follows:

Table 2: Example of recorded WebCT hits as entered for one student

WebCT Wk 6	WebCT Wk 9	WebCT Wk 12	WebCT Exam Wk
41	50	67	72

Across the entire group of over 500 students, this information produced the following data regarding average numbers of visits to WebCT pages at three-weekly intervals over the semester, also presented as percentages of the total visits for the semester:

Table 3: Average total number of WebCT page hits across grades as recorded at intervals

Grades	Week 6	Week 9	Week 12	Exam Week
High	46	61	81	90
Distinction	(51%)	(68%)	(90%)	(100%)
Distinction	38	56	75	84
	(45%)	(67%)	(89%)	(100%)
Credit	34	49	67	76
	(45%)	(64%)	(88%)	(100%)
Pass	31	46	64	75
	(41%)	(61%)	(85%)	(100%)
Fail (40–49)	26	39	52	61
	(43%)	(64%)	(85%)	(100%)

29 No totals or entries of any kind sought before the week 6 total. In other words, no week 3 total was sought. This was due to a recognition that a large number of students would not be able to physically access the WebCT page in the first three weeks of semester. Past experience had attributed this to administrative problems which had prevented students' user names being loaded onto the system, late enrolments, and system failures which had made use of the site very limited in the first couple of weeks of semester. Thus, it was considered that any tallies recorded for week 3 could carry little compelling weight.

The clearest trend evidenced from this information is the way the High Distinction students stand out. In the first half of the semester, not only did these students access the WebCT site more often than other students, but they also accessed the site in the first half of semester more often than they did in the second half of semester. More than 50% of the High Distinction students' activity on the WebCT site occurred before the half-way mark of the semester. Further, as a percentage of their total activity on the WebCT site they remained ahead of all other groups of students until the final weeks before the final exam although at a decreased rate. To adopt racing parlance, the High Distinction students "departed their blocks quicker" than the other students. They accessed the WebCT site earlier than other students, explored, examined and familiarised themselves with it at greater length than other students. As the semester's end approached, their activity decreased, presumably as they revised the material already obtained and prepared for the exam.

The same trend can also be observed by simply comparing the average number of hits before week 6 and after week 6, that is, between the first half of the semester and the second half.<sup>30</sup>

Table 4: Average total number of hits on WebCT pages recorded across grades before week 6 and after week 6 in a 13-week semester

	<b>Up to Week 6</b>	<b>After Week 6</b>
High Distinctions	46	44
Distinctions	38	46
Credits	34	42
Passes	31	43
Fails (40-49)	26	34

Once again, the same information presented in another format demonstrates the same trend. Whereas High Distinction students' use of the WebCT site was appreciably higher in the first six weeks of the semester, reaching into the forties for numbers of hits (and being the only grade band of students to achieve this), it then decreased in the second half of semester. Conversely, all other grade bands increased. The other pass grades climbing from around thirty hits in the first six weeks of semester to figures in the forties for the second half of the

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<sup>30</sup> Figures for after week 6 were determined by subtracting the total number of hits from hits recorded up to week 6.

semester. In brief, in the second half of the semester all pass grades, including High Distinctions, recorded comparable numbers of hits. It was in the first half that the High Distinction students differentiated themselves.

The trend suggests that better performing students did access the commercial law website more often than other students. However, the evidence indicates this is attributable to them being more attentive and active on the site earlier than other students.

Further, such information should not come as a surprise. Whether frequent accessing of the website contributed to these students' success or whether the evidence of their frequent use of the website was simply an early indicator of the students most likely to perform well, that evidence is nevertheless reflective of the value of the website as perceived by these students. Better students use the website.

### *Confirming the Trend*

The trend drawn from bare averages alone can be statistically open to question. Indeed, if only because a great many more students recorded Pass and Credit grades than High Distinctions, the claims made for those latter students and their study habits are on less certain ground. This is because, if one or two students recorded a very high number of hits, it would lift the average number of hits for a small number of High Distinction students appreciably, as opposed to the effect of a similar number of hits on the average of a grade band containing over 100 students as in the Credit or Pass grades.

Accordingly, to make the evidence of the figures more compelling by subjecting them to a further statistical test, median values were obtained to see whether the trend of the averages was replicated. Assuming the trend was replicated, the medians would be useful for supporting the evidentiary value of the averages referred to above, providing a further description of the material obtained. The median values returned for the first six weeks and the second six weeks appear below in Tables 5 and 6 (non-shaded cells).

Table 5: Medians for total number of hits for first six weeks

<i>Kruskal-Wallis Test: First six weeks versus Grades</i>				
	<b>Nos</b>	<b>Median</b>	<i>Average Rank</i>	<b>Z</b>
<b>High Distinction</b>	14	38.50	309.3	2.21
<b>Distinction</b>	64	36.00	271.6	2.59
<b>Credit</b>	154	30.54	243.5	1.37
<b>Pass</b>	165	25.00	216.3	-1.83
<b>Fail (40-49)</b>	65	21.00	185.5	-3.00
	462		231.5	
<i>H = 21.63 DF = 4 P = 0.000</i>				
<i>H = 21.64 DF = 4 P = 0.000 (adjusted for ties)</i>				

Table 6: Medians for total number of hits for second six weeks

<i>Kruskal-Wallis Test: Second six weeks versus Grades</i>				
	<b>Nos</b>	<b>Median</b>	<i>Average Rank</i>	<b>Z</b>
<b>High Distinction</b>	14	35.50	274.4	1.22
<b>Distinction</b>	64	30.50	246.0	0.94
<b>Credit</b>	154	28.00	243.6	1.38
<b>Pass</b>	165	28.00	229.2	-0.27
<b>Fail (40-49)</b>	65	24.00	185.1	-3.02
	462		231.5	
<i>H = 11.36 DF = 4 P = 0.023</i>				
<i>H = 11.36 DF = 4 P = 0.023 (adjusted for ties)</i>				

Tables 5 and 6 reveal the medians did mirror the trend observed in the averages. However, as a further measure the medians were finally subjected to statistical non-parametric testing to confirm the trend was more than a coincidence.

The relevant test applied was the Kruskal-Wallis test and an explanation of its results is set down in the notes below.<sup>31</sup> The data in the shaded portions of Tables 5 and 6 have been provided for reader's verification of this test. Suffice to say, the trend was confirmed.

Therefore, the hypothesis identifying the correlation between student performance and the frequency of their use of the WebCT between remains intact.

## Conclusion: What Does it Mean?

The adoption of modern teaching aids, including the Internet and websites, recalls a similarity between law teachers and practitioners. On the one hand, there are those law teachers who maintain that the teaching methods of a century ago are still the most effective and who turn their backs on anything that might suggest change. Conversely, there are law lecturers who bear an uncanny resemblance to their brethren in practice,<sup>32</sup> desiring to use the latest equipment the modern

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31 These tests were administered by Mark Hastings of the Department of Econometrics and Business Statistics, Monash University. A non-parametric test was required because the statistical population distribution of the data set is unknown (ie supra note 30 above). Readers seeking further explanation of the Kruskal-Wallis test and non-parametric tests should consult A Selvanathan, B Selvanathan, G Keller and B Warrack et al, *Australian Business Statistics* (3rd ed, Victoria: Thomson, 2004), Ch 16: "Non-parametric techniques: Comparing two populations". The test was applied through the Minitab software program version of 14 produced by Minitab Inc, and available at <http://www.minitab.com>. The purpose of this test is to determine if at least one median is statistically different from the other medians. To this end, the semester was split into two 6-week periods. The application of the Kruskal-Wallis test on grading and median hits resulted in an overwhelming rejection of the hypothesis that the medians are the same. To explain, for the first six weeks it was found that at least one median was different. This was supported by the p-value for the first six weeks being 0.000. Therefore, it was concluded at the 1% level of significance, at least one median was different. Similarly, in the second six-week block, it was also found that at least one median was also different. The p-value for the second six weeks was 0.023. Therefore, it was concluded at the 5% level of significance, at least one median was different. This is also in support of the descriptive statistics noted in the averages above, and the discussion below. In other words, the Kruskal-Wallis test as applied to this data set supports the cogency of the material forming the basis of this discussion in this article. Note that the figures in these tables have been rearranged from the order in which the Minitab program produced them. Specifically, Minitab produced the data beside each mark in alphabetical order of the marks (ie "C", "D", "HD", "N" and "P"). They have been rearranged in the order High Distinction, Distinction, Credit, Pass and Fail so as to be consistent with the other tables produced in this article. This information should be considered for those readers seeking to test this data.

32 The author does recognise that this similarity is frequently due to the fact that the law teacher is frequently a "moonlighting" practitioner.



age has to offer, the only difference being that the practitioner will pursue the latest motor vehicle, whereas law lecturers are slightly more limited in the gadgets they can afford. The software programs by which websites are created have been one example of such technology being swiftly embraced by these open-minded people. However, an associated danger is to incorporate such devices as an integral tool of any course and to use precious resources of time and effort – commodities the legal academic can ill afford without actually seeking to ascertain the value of such devices and expenditure. Is the balance “in the black”?

It is difficult to convince lecturers who do not use such technologies in their teaching that there are good educational reasons for using these technologies.

This article has set down some evidence as to why the adoption of websites, a dedicated WebCT site in this case, even as mere platforms for the delivery of materials, is a tool to be embraced. Even taking the students’ view that the website is a valuable tool and that they would encourage its retention, it was observed that generally those students who accessed the website also appear to have been the students who performed to a higher standard in the unit. In other words, all students appreciate the tool and the better students particularly appreciate the website.

Identifying this correlation has been the major focus of this article. At the time the information was gathered, there was little such information regarding this particular use of a website in a law unit of comparable size. Since that time this trend in noting a link between the student use of a dedicated website with student performance has been observed elsewhere in similar circumstances in law courses.<sup>33</sup> No doubt, it will be replicated in other studies yet to be completed. Such studies provide greater statistical persuasiveness to the argument in favour of using such technologies, beyond the descriptive nature of the evidence presented in this article. Speculative reasons for the trend observed can only be suggested.

However, the tempting theory that the use of the new technologies in teaching improves student performance is not directly reflected upon in this article. One reason for

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33 NO Stockmeyer of the Thomas M Cooley Law School, Lansing, Michigan, USA, upon reading a brief summary of the author’s results as presented in the bulletin of the North American based Institute for Law School Teaching, *The Law Teacher* (referred to in note 34 above), undertook a similar survey which confirmed the results presented in this paper. See “Link Between Use and Grades Confirmed” (unpublished paper, August 2003).

this is that there is no comparable data evidencing how the introduction of earlier teaching technologies in the unit affected student performance. Further, to mount an argument without such a clear comparison would be to run contrary to numerous studies reported over the last 40 years that indicate that different technologies or media utilised in teaching do not affect learning outcomes.<sup>34</sup> Indeed, as Richard Clark wrote in 1983 to describe the argument: "The best current evidence is that media are mere vehicles that deliver instruction but do not influence student achievement any more than the truck that delivers our groceries causes changes in our nutrition."<sup>35</sup>

Although this appears to be the predominant view,<sup>36</sup> Clark can also cite a series of studies which reported that the novelty of new technologies would, at least for a time, result in increased effort or persistence on the part of students which, in turn, would lead to gains in achievement.<sup>37</sup> Although he notes that the effect was found amongst secondary students and not tertiary students using computers,<sup>38</sup> the "novelty" effect does at least hold the possibility that the new technologies may stimulate students. However, balanced against this possibility is an idea with which Clark opens his survey: that what might actually lead to an improvement in student performance at the same time as the introduction of a new teaching technology is actually the "curricular reform which accompanied the change".<sup>39</sup> As Wilbur Schramm noted in his book, *Big Media, Little Media*, although teachers may spend a great deal of time determining which is the best medium to employ in their teaching to determine whether the "big media" (new technologies) are really worth five times the cost of the "little media",<sup>40</sup> learning "seems to be affected more by what is delivered than by way of delivery system".<sup>41</sup> Despite this view, if the introduction of a new technology has the effect *on teachers* of stimulating them into revising or refreshing their

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34 Although written over 20 years ago, a substantial survey of this literature is provided by R E Clark, "Reconsidering Research on Learning from Media" (1983) 53(4) *Review of Educational Research* 445.

35 Id at 445.

36 R Dubin and T C Taveggia, *The Teaching-Learning Paradox* (Centre for Advanced Study of Educational Administration (Eugene: University of Oregon, 1968).

37 J Kulik, C Kulik and P Cohen, "Effects of Computer Based Teaching on Secondary School Students" (1983) 75 *Journal of Educational Psychology* 19, cited in Clark, supra note 38 at 450.

38 Id.

39 Id at 445.

40 W Schramm, *Big Media, Little Media* (California: Sage Publications, 1977) 275.

41 Id at 273.

curricula at regular intervals, then the outcome will surely be better for students.

Therefore, in this context there is a possibility that there may be a causative link effect – albeit an indirect link – between new teaching technologies and student performance. Of course, there are other matters that may have stronger claims to affecting student performance. For example, study time and the study environment would be strong contenders. Certainly, a student’s natural intellectual abilities cannot be discounted.

However, this article has been concerned with identifying whether those better students use a particular technology. It has established that those students who will perform well will generally use this technology. Therefore, subject to exceptions,<sup>42</sup> evidence of frequency of student access can assist teachers in identifying students who already have the capacity to do well, with or without the website. Add to this the evidence that the better students value websites and that the majority of students value the site, there appears at least to be engagement by students with their studies.

Socrates would probably have approved.

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42 Indeed, as if to confirm this possibility and defy the trends of the group of 506 students as a whole, it is perhaps pertinent to note that the student who finished first in BTF1010 in Semester 1, 2002 with a High Distinction recorded only 66 hits on the WebCT site – a tally just above the average for a Fail student! This is, presumably, the “exception which proves the rule”.