

Blended Learning: out of the lab?

**Roland Fox
Salford Business School**

**Salford University
M5 4WT**

0161 295 5063

r.p.fox@salford.ac.uk

Blended Learning: out of the lab?

Abstract

Blended learning is often considered to be too costly to meet teaching in the traditional context. This paper questions such an assertion by examining the outcome and reflecting on the use of HTML and podcasts to replace a single traditional accounting lecture. The context was staff absence due to illness at the very end of a module, but the relevance could equally apply to student absences – can students make up for a missed lecture?

The study was unique in the sense that it was without an experimental effect, the member of staff was genuinely ill and blended learning was all that was available to replace the lecture. Papers on new approaches to education are almost always the result of planned research and are often highly suspect simply because students and staff are reacting to the experiment itself rather than the content. The comment from reviewers that this paper needed to be replicated in other contexts was not realistic given that the lecturer has now thankfully recovered!

The outcome showed no significant difference in assessment scores between blended and traditional deliveries but a significant difference in outcomes between high and low usage of the blended material and a high level of acceptance from students.

Reflections on the cost of the exercise in time and money question the standards reported in the literature. The argument here is that funding such educational innovation obstructs the object of the research as unnecessarily high standards are advocated as justification. There are in practice no benefits beyond 'good enough'. The notion that funding such research is a waste of money and adversely affects development is not a popular conclusion in the academic world!

Keywords: audio, multimedia, blended learning, development cost, good enough

Blended learning: out of the lab?

Introduction

This paper reports on the use of blended learning to replace a single lecture in a second year finance and accounting module for business students. The need arose due to staff illness. The traditional response is to reschedule the lecture at a mutually convenient time for staff and students. This was not an attractive option in this case in part due to time pressures on students and staff; far better to deliver the lecture asynchronously (podcasts embedded in HTML in this case) enabling both lecturer and student to fit the lecture into a busy end of module schedule. The subject (variance analysis) was typical of many accounting subjects requiring explanation of complex processes. – the ability to listen again, particularly for foreign students, was thought of as an advantage over traditional delivery for this subject. The alternative strategy was therefore not considered to be necessarily inferior. As the lecture was supported by a traditional revision session, the result can fairly be described as blended learning. Fortunately staff absence is relatively rare; however, the exercise also reflects the value of blended learning for student absence and therefore has wider application. It can also be seen as a response to the suggestion by Laurillard (2008) that technology should be used to solve existing teaching led problems rather than being the basis of an alternative approach.

Literature review

Blended learning is not a clearly defined concept (So and Brush 2008, Oliver and Trigwell 2005; Oblinger et al 2001) and the general understanding that it is simply mixing media says little about the content of web based material or the proportions in the blend. Most references to

the use of technology in blended learning are to lecture notes, slides, quizzes and visual rather than audio material. For example, the survey of economics lecturers in the CHEER (2007) report makes no mention of on line lectures as part of VLE usage. The list of reasons given by lecturers for non development reflects a lack of belief in the incremental net benefits of developing software applications in general with a particular emphasis on the cost. Typical comments reported are:

- “• They are VERY time consuming and the payoff is low
- No time to invest in sunk cost required
- Time constraints for setting up courses...
- Lack of development time
- Need coaching to be sure which are available, as well as how
- Too much investment in learning how to use for marginal gain in delivery to students over what I do at present” (CHEER 2007, p2).

The cost in terms of preparation time is critical to combining the new technology with existing delivery yet receives only passing mention in most papers on audio visual material. Perhaps because of research funding or some false extension of Moore’s law it appears to be assumed that preparation time is or will be a minor consideration. For example, Dunbar (2004, p341) reports: “I did not track my time for the planning part of the process, but I estimate that I spent at least 10 – 15 hours per week for the spring semester working on transforming the face to face class to an online class.” And Fordham (1996, p39) sets standards that appear more as prohibitive investment of time and effort in observing that: ‘Video can be superior to the lecture environment in many respects. The presentation can be prepared in a studio... Pre-recording allows for “re-takes” which eliminate misstatements and unnecessary pauses. The tape can be free of distractions found in classroom settings. The finished tape can incorporate animation and special effects which can more clearly convey a complete idea than can chalk or still transparencies. ...’ Fordham then notes that 16 hours were spent editing 24 segments of 6 minutes each!

There is also a certain nervousness from universities conscious of the need for quality control procedures. In the early days of audio it was a commonly held view that actors should be hired to read scripts prepared by the lecturer. That concern has faded, but there still remains a similar over elaboration in the form of extensive pedagogic structures that were never applied to traditional lectures. Granic et al (2009), for example, list 27 user requirements and 14 pedagogical dimensions!

Criticism of costs in the literature is rare. A notable exception is Bach (1995 and 2003) who, in the context of software development, has coined the term 'good enough' to attack the idealistic stance that he describes as follows: 'Software quality is a simple concept at least in the textbooks. Just determine your requirements, and systematically assure that your requirements are achieved. Assure that the project is fully staffed and has adequate time to do its work. Assure that the quality assurance process is present in every phase of the development process, from requirements definition to final testing. Oh and remember that it's absolutely critical that management be committed to quality on the unquestioned faith that it is always worth whatever it will cost. Otherwise, forget the whole thing'. With respect to software development he describes the goal that is applied in commercial practice as 'to reach an acceptable level of risk. At that point, quality is automatically good enough' (Bach 2003, p3). He observes that highly successful software packages were marketed with known bugs; but as the bugs had little or no effect, quality was not affected. The Shannon and Weaver communication model (Shannon and Weaver 1949) famously sees a positive role for imperfections: "When there is noise on a channel, however, there is some real advantage in not using a coding process that eliminates all of the redundancy. For the remaining redundancy helps combat noise." (p.112). Communication with students is undoubtedly a noisy channel. With respect to audio, the concept of good enough and noise suggest that the extensive editing reported in papers is an unnecessary cost. A "first take" should be "good enough" if the imperfections do not distort the message. This philosophy is demonstrated amply on the internet, typical examples are very popular YouTube

clips on issues such as the credit crunch presented in a light hearted conversational mode (“Are you with me? Yes I am so far!”) and a Yale professor (Shiller, 2009) engaging in the eternal search for the board rubber. Not only is it costly to edit these perceived imperfections, it is doubtful that the process adds to the attraction or effectiveness of the material.

The CHEER report also reflects the commonly held view that the benefit for the student is marginal. Boyle et al 2003 find improved overall scores following redesigning of a module to include enhanced blended learning – but the blending was one part of the project. Wider change is almost inevitable in any large scale application, this combined with the experimental effect creates a bias towards positive results. It is therefore surprising that, in general, studies find no difference between traditional and blended deliveries (Utts et al (2003), Carroll (2003) and Cagne et al 2003). This is in line with the wider media comparison studies (Conga, 2005; Smeaton and Keogh 1999)) and the no significant difference thesis (Russel 2003, WCET 2009) - an extensive review of papers going back to the 1930’s radio broadcasts. A qualification to this conclusion is the finding that the use of blended learning can be significant in explaining individual performance (Dowling et al 2003, O’Toole et al 2003) despite overall results being no better than traditional delivery.

Many studies also report on student views. One might have expected blended learning would be a much valued benefit. The ability to revisit lectures, to listen in ones own time and to catch up after absence through illness etc seem immense. Student surveys for the most part, however, are restrained and welcoming but with little appetite for abandoning traditional methods (Salaway,et al 2007, Mackey and Ho 2008). Marriott et al (2004) records vividly the reluctance of some students to see the internet as anything other than second best. As he points out, the students on campus have already expressed a preference for the classroom and social interaction. This view may change, in a more recent study also of blended learning So and Brush (2008) report health education students as having greater satisfaction the more exposed they have been to distance learning material in prior learning. The preferences, however, do not

appear strong overall; a meta analysis of 24 papers on student satisfaction (Allen et al 2002) reports no significant difference between satisfaction scores of distance and traditional education in higher education.

In general, the no significant difference finding both in terms of effectiveness and satisfaction appears to be the current position; in which case, using blended learning to support existing delivery may well prove to be a significant role if preparation time is not significantly greater.

Event description and results

Given the unavailability of staff due to illness for the final lecture of a module, it was decided that the best alternative was to prepare an online lecture. Monitoring of outcomes and performance was necessary to ensure that students had not been disadvantaged. The subject, variance analysis, then formed part of the normal revision programme and was subsequently assessed at the end of semester exam that had been prepared months previously.

Preparation time, that is, time spent converting material for a traditional lecture delivery to the chosen asynchronous format was 7 hours (prepared on Wednesday 29th April). The content consisted of 13 HTML pages with 12 audio tracks each inserted on the relevant page using the RealAudio template. The package totalled 80.5 megabytes and was developed using Wimba Create. The audio tracks lasted just under 1 ½ hours in total and took an estimated 3 hours preparation as part of the 7 hours. All recordings were first takes (with one or two false starts), there was no editing. The remaining 4 hours required some time familiarizing with aspects of the Wimba Create package and the rest of the time converting existing material. The package was launched via Blackboard on Wednesday 30th April and the revision session was held the following Thursday (7th May). The exam (on May 13th) counted for 50% of the overall

assessment; there were 5 questions in the paper, students had to answer any 2 – there was therefore no obligation to answer the question delivered by blended learning.

Papers were marked by an external marker and moderated in the usual way. The marker was not made aware of the audio lecture. Finally a module on line evaluation questionnaire was delivered in the revision week to assess the module overall and views on blended learning.

Usage of the lecture was monitored using Blackboard and is summarized in Table 1. Half the students (49%) opened the software but only about half of those (55%) attempted the question. Apart from the 5 students with poor learning strategies (attempting the question without opening the software) exam performances were even across the categories.

Table 1 Analysis of Usage of blended learning and assessment

	number		exam average
Did not open audio lecture or attempt question	30	20%	57%
Opened audio lecture but did not attempt question	73	49%	58%
attempted question but did not open audio lecture	5	3%	56%
attempted question and opened audio lecture	40	28%	59%
total sitting exam	149	100%	58%

Marks from individual questions (Table 2) showed that the mean for question 4 (on variance analysis and delivered via blended learning) was not significantly different at the 5% significance level from all other question means apart from question 2.

Table 2: Question analysis - Q.4 taught through blended learning, other questions by traditional methods

	Q. 1	Q. 2	Q. 3	Q. 4	Q. 5	Total
attempts	32	125	74	45	16	292
Mean	54.3	64.0	53.9	57.6	56.6	58.0
Standard deviation	10.9	7.4	8.7	12.9	7.8	15.8
Standard error of mean	1.9	0.7	1,0	1.9	2.0	0.9

Use of the asynchronous material was monitored via Blackboard. The “hits” were recorded each day and represented HTML files opened in the package. This produced three measures, the total hits, number of days recording at least one hit and days before first hit - a measure of the extent to which the learning was last minute. Repeated hits in one day could simply have been a matter of style of usage (browsing as opposed to listening) and was therefore considered unreliable. The preferred usage measures were therefore number of days with at least one hit and days before first hit. Outcome measures used were the question score and the difference between Q4 and the other question attempted by the student (the relative mark). The latter measure was preferred as it offered a control for overall ability. The correlation table is reported in Table 3.

Table 3 correlation of blended learning usage with outcome

		Usage measures	
		days before blended study commenced	days blended material studied
Outcome measures	Q4 mark (blended delivery)	-0.238	0.324**
	Difference (blended – other mark)	-0.417*	0.421*

*significant at the 1% level

** significant at the 5% level

The preferred measure of days studied with the difference between the marks for the blended learning based question and the mark for the other question was significant at the 1% level and was the highest of the outcome usage associations. Stepwise regression of relative scores with all measures of usage (not reported here) confirmed that the days studied was the best association with no other variable offering a significant additional explanation. To give an idea of the size effect, the highest 10 users averaged 64.8% for Q4 and 8.9% marks *more* than their other question, the lowest 10 users averaged 52.8% for Q4 and 10.6% marks *less* than their other score. There is also evidence as to the style of learning. Bearing in mind that delivery and assessment were over a two week period, the later the package was opened, the lower the mark (-0.417 correlation).

A second measure of outcome was student opinion. Students were asked to state the three best and worst aspects about the module as a whole and, as an additional question to the normal format used for all modules, students were asked to choose from a range of degrees of blending. In relation to overall good and bad aspects (not reported here) 17% of the good aspects could be

related to blended learning and none of the bad aspects were so related. The response on blending is given in

Table 4 Measures of student opinion on blending

	number	percent	
No role for audio lecture	17	32	45
Support material only	7	13	
Audio lecture to replace half existing lecture time	21	40	53
Audio lecture to replace more than half the existing lecture time	7	13	
Not classifiable	1	2	2
Total	53	100	100

blending is given in Table 4. Results show that 45% saw audio material as either having no role at all (32%) or as support material only (13%). A quite different view was held by 53% of the students 40% agreeing to a 50% reduction and 13% to more then 50%. Overall the finding is therefore of a wide spread of opinions.

Discussion and conclusions

This study is an example of what Laurillard (2002) recommends, namely, the need to use technology to serve existing needs rather than completely revise delivery. The use reported here was a response to an unanticipated event – staff absence. It was therefore small scale and required a short development time. The relevance, however, is wider in that from the student perspective the application could represent support for missed lectures through their own absence due to late admission, illness etc., a more frequent event; or if English is a second language, the material enables them to understand the lecture in greater detail. The outcome

results for the student were comparable to many findings in the literature, overall results were similar to traditional delivery but greater use of the on line material was strongly related to better performance. Student views are best described as mixed with a significant contingent seeing only a minor role for asynchronous material. In sum, the use here appears effective on an individual basis. That it would ever be significantly better overall than traditional delivery is not supported here or in the literature; and it is perhaps such a chimera that hampers development. It is also relevant that the subject was very much an accounting area with a lengthy worked example as part of the delivery – an aspect that could not have been easily delivered in a lecture. Accepting that traditional delivery can be no more than matched places more emphasis on cost, particularly in terms of staff time. Even with the concept of good enough, the preparation time here of 7 hours to produce a 90 minute lecture was still far too long. In part, the difficulty is poor product specification from academics resulting in over elaborate software. A clearer understanding of what is good enough to match traditional delivery would do much to simplify the software and reduce preparation times. Only then will its role in supporting existing delivery be fully understood.

References

- Allen, M., Bourhis, J., Burrell, N., & Mabry, E. (2002). Comparing student satisfaction with distance education to traditional classrooms in higher education: A meta-analysis. *American Journal of Distance Education*, 16(2), 83–97.
- Bach, J. (1997) 'Good Enough Quality: Beyond the *Buzzword*' *IEEE Computer Magazine*, vol 30, No 8, pp96-98
- Bach, J. (2003) *The challenge of "Good Enough" Software*, <http://www.satisfice.com/articles/gooden2.pdf>, April 2006.
- Boyle, T., Bradley, C., Chalk, P., Jones, R., & Pickard, P. (2003, October). Using blended learning to improve student success rates in learning to program. *Journal of Educational Media*, 28(2-3), 165-178.
- CHEER (2007) Views of lecturers and students on e-learning (from Economics Network surveys) at <http://www.economicsnetwork.ac.uk/projects/surveys> accessed 08/06/09
- Conga, S.B. (2005) If There Is No Significant Difference, Why Should We Care? *The Journal of Educators Online*, Volume 2, Number 2, pp 1-4

Dowling, C., Godfrey, J.M., & Gyles, N. (2003, December). Do hybrid flexible delivery teaching methods improve accounting students' learning outcomes? *Accounting Education*, 12(4), 373-391.

Dunbar, A. (2004) Genesis of an on-line course, *Issues in Accounting Education*, vol 19, No. 3, pp.321 – 343.

Fordham, D.R. (1996) Freeing class time: empirical evidence on the benefits of using our of class video segments in lieu of in class reviews, *Issues in Accounting Education*, vol 11, No 1, pp37 – 48.

Gagne, M., and M. Shepherd (2001) A comparison between a distance and a traditional graduate accounting class, *T.H.E. Journal* (April) pp. 58 – 64.

Granic, A., Mifsud C. and Cukušić, M. (2009) Design, implementation and validation of a Europe-wide pedagogical framework for e-Learning. *Computers & Education* (2009), doi:10.1016/j.compedu.2009.05.018

Laurillard, D. (2002) *Rethinking University Teaching: A Conversational Framework for the Effective Use of Learning Technologies* (second edition). London: Routledge Falmer

Laurillard, Diana (2008) 'The teacher as action researcher: using technology to capture pedagogic form', *Studies in Higher Education*, 33:2, 139 – 154

Mackey Thomas P. and Ho Jinwon (2008) Exploring the relationships between Web usability and students' perceived learning in Web-based multimedia (WBMM) tutorials *Computers & Education* 50 386–409

Marriot, N., Marriot, P. and Selwyn, N. (2004) Accounting undergraduates changing use of ICT and their views on using the Internet in Higher Education – a research note, *Accounting Education: An International Journal*, vol 13, Supplement 1, pp.117-130.

Oblinger, D. G., C.A. Barone and B.L. Hawkins (2005) *Distributed Education and its challenges: an overview* Washington D.C. American Council on Education.

OECD (2005) *E-Learning in Tertiary Education: Where Do We Stand?* Centre for Educational Research and Innovation (CERI)

Oliver, M. and K. Trigwell (2005). Can "Blended Learning" Be Redeemed? *E-learning* 2(1): 17-26

O'Toole, J.M., & Absalom, D.J. (2003, October). The impact of blended learning on student outcomes: is there room on the horse for two? *Journal of Educational Media*, 28(2-3), 179-190.

Russell, T. (2003) *The no significant Difference Phenomenon* 5th edn, Montgomery, AL: The Instructional Telecommunications Council.

Salaway, G., Caruso, J.B. and Nelson, M.R. (2007) The ECAR study of Undergraduate Students and Information Technology 2007, Educase Centre for Applied Research, vol 6

Shannon, C.E., & Weaver, W. (1949). *The mathematical theory of communication*. Urbana: University of Illinois Press.

Shiller, R. (2009) Behavioral Finance: The Role of Psychology
<http://www.youtube.com/watch?v=0ZLNbxWH8Lc> (accessed 04/08/08)

Smeaton and Keogh, G. (1999) An analysis of the use of virtual delivery of undergraduate lectures *Computers and Education*, vol 32, pp83 – 94.

So Hyo-Jeong and Brush Thomas A. (2008) Student perceptions of collaborative learning, social presence and satisfaction in a blended learning environment: Relationships and critical factors, *Computers & Education*, 51, pp 318–336.

WCET, 2009, <http://www.nosignificantdifference.org/search.asp>, accessed 22/09/2009