

Assessing Teaching Innovations: Meeting the Online Threat

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1. Introduction

The emergence of increasingly sophisticated online university courses means that online teaching poses a threat to traditional face to face teaching methods in universities world wide. This paper consists of three parts. First, the online teaching threat is examined. Second, the paper examines implementing a face to face teaching innovation in respect of teaching taxation law to undergraduate business and law students. Third, the paper assesses the effectiveness of this innovation. The paper finds that face to face teaching in a blended learning environment that incorporates online methods offers important advantages to students that are not available to online courses.

2. The Online Threat

The emergence of increasingly sophisticated online university courses means that online teaching poses a threat to traditional face to face teaching methods. For example, the Open Learning Agency (now Open Universities Australia) started in 1993 as a small enterprise. In 2003 it had grown to 40 staff and \$15 million turnover.¹ In 2012 it has 55,000 student, 300 hundred staff and a turnover near \$200 million.² Since 2008 student numbers have increased 30 per cent per annum.³ Wappert, chief executive of Open Universities Australia, asserts that the online education revolution having a long way to go and has yet to fully establish itself.⁴

¹ J Mather 'Opening minds and futures' Australian Financial Review 25 June 2012, 23-24.

² Ibid.

³ Ibid.

⁴ Ibid

OUA has found that the use of immersive and inter-active gamer type technologies into online courses provides a major improvement for online education.⁵ Other advantages of online education flow from the digital trail provided by the student interactions. This data can be used to monitor and predict student progress and hence enable timely information management. This information could be used to improve completion rates and student performance.

Further, numerous other universities are entering the online education. Swinbourne University and online employment company Seek have established Swinbourne Online. Charles Darwin University has also set up online courses.

There are signs that corporate education is moving towards online training. For example OUA provides online corporate education to organisations such as National Australia Bank.⁶ Large government departments such as the Australian Taxation Office rely heavily on online training.

In the US, a start up online education company, Coursera, has experienced explosive growth. Since its inception, (a period of 5 months to September 2012), Coursera has enrolled 1.35 million students in a choice of 200 free online courses.⁷ Its students are sourced from 196 countries (1/3rd from US, then Brazil and India have the largest cohorts). Coursera has 33 partner universities (which include Ivy League institutions such as Princeton, Stanford and University of Pennsylvania). Free online education companies such as Coursera, edX and Udacity, do not confer university degrees. Whilst online tests are provided they can not be authenticated.

⁵ Ibid.

⁶ Ibid.

⁷ Coursera website <https://www.coursera.org/#about> accessed 29 September 2012.

There maybe a risk for universities in providing content for no revenue. Mr E. Gordon Gee, the President of Ohio State University, has concerns about their involvement, stated:⁸

“That does keep me up at night. We’re doing this in the hope and expectation that we’ll be able to build a financial model, but I don’t know what it is. But we can’t be too far behind in an area that’s growing and changing as fast as this one.”

Whilst John Mitchell, the vice provost for online learning at Stanford University, asserted that he “could imagine licensing courses, with other colleges paying a fee to use the material, just as they would for a text book”.⁹

There is some inherent limitation to distance learning that does not fully and effectively encompass student learning needs and provide for effective examination. Online does not allow for face to face student interactions with lecturers and each other. This all appears to be its central flaw given its reliance on the best online methods.

Past threats to traditional university teaching posed by the introduction of books, postal services, telephone, television, radio and video conferencing did not lead to the demise of universities. Rather, these technologies have been incorporated into university teaching as blended learning. So it would appear that traditional universities obtain the benefits of online education by merging this with face to face teaching to provide a blended learning environment for students.

The key issue remains, will traditional universities meet the same fate as newspaper that are now struggling in the online environment? Given that Australian universities are principally funded by the federal government, market forces alone may not decide this outcome. It may be based on a decision made in Canberra in order to reduce the education budget. Marginally profitable courses (perhaps even smaller universities)

⁸ T Lewin, ‘Education site expands slate of universities and courses’ New York Time, 18 September 2012, A20.

⁹ Ibid.

appear most at risk. In summary, it appears prudent for traditional universities to maximise the effectiveness of face to face teaching to counter the online threat.

There are many different ways of conducting face to face teaching. It is beyond the scope of this paper to detail the various methods. The most appropriate methods will vary according to the type of teacher, the composition of the student cohort, teacher resources and the subject matter. Rather, the paper focuses on an experiment of implementing a face to face teaching innovation in respect of undergraduate taxation law and subsequently assessing its effectiveness.

3. Theoretical framework for a face to face teaching innovation

This paper analyses the findings of an experiment in face to face team based learning¹⁰ (herein after referred to as TBL), used in conjunction with scaffolding and a blended learning environment. This experiment was conducted on final year accounting and law undergraduate university students studying an introductory taxation law topic covering taxation policy, goods and services tax and income tax.

3.1 Face to Face Team Based Learning

TBL was chosen as the face to face teaching innovation for taxation law because it is not widely used in tax law teaching in Australian universities and research shows such teaching methods are effective. Vygotsky provided a sociocultural framework for

¹⁰ L K Michaelsen, W Watson, J P Cragin and L D Fink 'Team Learning: A potential solution to the problems of large classes' (1982) 7(1) *Exchange: The Organizational Behaviour Teaching Journal* 13. : defined team learning as 'extensive classroom use of permanent, heterogeneous, six or seven member student work teams to accomplish learning objectives'. L D Fink 'Team learning: Putting "sTeam" into learning groups' (2007) <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.138.8502&rep=rep1&type=pdf> accessed 29 September 2012 : defined team learning as 'a particular course structure that is designed to support the development of high performance learning teams and to provide opportunities for these to engage in significant learning tasks'.

learning that was based on the ability for student interaction with others. Abraham outlined Vygotsky's key assumptions about learning:¹¹

1. the notion that "social interaction plays a fundamental role in the development of cognition";¹²
2. key concepts and ideas should be explained and revised before they are used in learning activities;¹³
3. good learning is that which is ahead of actual development;¹⁴
4. higher order functions develop out of social interaction;¹⁵ and
5. optimal learning occurs within the Zone of Proximal Development (ZPD) which can be defined as "the region that lies beyond the learner's independent problem-solving skill, but still within reach with the right support"¹⁶

Online courses are unable to effectively apply the first and fourth of these key principles since they exclude face to face interactions. The fifth principle is difficult to achieve in an online only environment given the limited nature of online support and the complexity of tax law problem solving. Team based face to face teaching though excels in this area as seen by the students reflections of their team based tax decision making. The second and third principles work well in both face to face and online environments.

¹¹ A Abraham and H Jones, 'Using Assignment Scaffolding as a Blueprint to Support Authentic Assessment and Learning in Accounting Education' The RMIT Accounting Educators Conference, Melbourne, 14 November 2011, 3.

¹² G Kearsley, *Explorations in learning and instruction: The theory into practice database*. (2008). Accessed 29 September 2012 at <http://tip.psychology.org/vygotsky.html>

¹³ A Hall, 'Vygotsky goes online: Learning design from a socio-cultural perspective' (2007) 1(1) *Learning and Socio-cultural Theory: Exploring Modern Vygotskian Perspectives International Workshop 2007*, Article 6. Accessed 29 September 2012 at <http://ro.uow.edu.au/llrg/vol1/iss1/6>.

¹⁴ Y Engestrom and A Sannino, 'Studies of expansive learning: Foundations, findings and future challenges' (2010) 5(1) *Educational Research Review* 1;

J Hammond and P Gibbons, 'What is scaffolding?' in J Hammond (Ed.) *Scaffolding: Teaching and learning in language and literacy education* (2001) Newtown: PETA, 1-14.

¹⁵ J P Lantolf and S L Thorne, 'Sociocultural theory and second language learning' in B Van Patten & J Williams (Eds.) *Theories in Second Language Acquisition: An Introduction*. (2007) Mahwah, NJ: Lawrence Erlbaum Associates.

In respect of TBL Michaelsen found that it aids educational outcomes and results in high satisfaction levels for students.¹⁷ Fink similarly observed that TBL assists students understanding of content and their ability to apply content.¹⁸ Fink also considered TBL to be helpful in other challenging teaching situations such as diverse student groups, courses with extended class durations, and courses that require analytical thinking skills.¹⁹ Michaelsen et al found that TBL also improves the effectiveness of teaching large class sizes.²⁰

The lack of student participation is a pervasive problem in university tutorials.²¹ In particular this is a real issue for accounting students.²² The Accounting Education Change Commission has called for students to be active participants in classes rather than passive recipients of learning.²³ It is reasonable to expect that increasing the engagement of accounting students would assist their performance.

There are also benefits for university teachers as TBL improves the enjoyment of teaching.²⁴ The greater levels of satisfaction of university teachers would also appear to positively impact on their teaching and thus assist student performance.

¹⁶ C J Bonk and K A Kim, 'Extending sociocultural theory to adult learning' in M Smith & T Pourchot (Eds.), *Adult learning and development: Perspectives from educational psychology*, (1998) New Jersey: Lawrence Erlbaum Associates, Inc, 67, 70.

¹⁷ L K Michaelsen 'Three keys to using learning groups effectively'(1998) 9(5) *Teaching Excellence: Towards the best in the academy*, Ames IA: POD Network, <http://teaching.uchicago.edu/ete/97-98/Michaelsen.html>. Michaelsen found small group based teaching methods aided educational outcomes where diverse groups of 5-7 individuals are created and that are involved in in class activities..

¹⁸ Fink above n 10.

¹⁹ Fink above n 10.

²⁰ Michaelsen, Watson, Cragin, Fink above n 10.

²¹ J Keddie and E Trotter, 'Promoting participation – breathing new life into the old technology of a traditional tutorial a teaching note' (1998) 7(2) *Accounting Education* 171; J Biggs, *Teaching for quality learning at university*, (1999) SRHE and Open Learning Press, Buckingham; P Ramsden, *Learning to teach in higher education*, (2003) (2nd ed), Routledge Falmer, London.

²² Keddie and Trotter above n 21.; P Marriot and N Marriot, 'Are we turning the on? A longitudinal study of undergraduate accounting students' attitudes towards accounting as a profession' (2003) 12(2) *Accounting Education* 113.

²³ Accounting Education Change Commission,(1990) 'Objectives of education for accountants: Position statement No. 1' 5(2) *Issues in Accounting Education* 307.

²⁴ Fink above n 10, Michaelsen above n 17.

This experiment is based on a model provided by Michaelsen.²⁵ Under this model, small group or TBL methods can aid educational goals where the teachers motivate the students to prepare and engage in ‘give and take’ discussions.²⁶ The following three keys are considered to be important to the effectiveness of such face to face group learning.

First, promoting ongoing accountability is vital to prevent under preparation by students and the group work becoming a social event.²⁷ Thus individuals and groups should be set tasks and assessed on their success.²⁸ Individuals can be set individual tests, verbal discussions for each individual and be assessed by way of peer evaluations. Groups can be tasked with assignments to that require an output that can be assessed so as to facilitate an inter group comparison.

The second key involved using linked and mutually reinforcing assignments at the individual work stage, the TBL stage and the total class discussion stage of the teaching process.²⁹ To optimise the impact on learning, assignments should be characterised by three S’s: same problem; specific choice and simultaneously report.³⁰ Under the same problem individual groups should work on the same issue. For specific choice individual groups should use topic concepts to make a specific choice. Finally, groups are required to report simultaneously.

Thirdly, practices that stimulate idea exchange should be adopted.³¹ For assignments this can be achieved by providing tasks that require group interaction.³² For example, require students to use course concepts to make difficult choices.³³ Barriers to participation can be alleviated by using permanent groups, assignments and a grading system that

²⁵ Michaelsen above n 17.

²⁶ Ibid.

²⁷ Ibid.

²⁸ Ibid.

²⁹ Ibid.

³⁰ Ibid.

³¹ Ibid.

³² Ibid.

³³ Ibid.

encourages group development.³⁴ Work in the classroom is preferred given the time constraints and difficulties for students to meet outside of class that will limit any serious group work.³⁵ Creating diverse groups of 5-7 individuals exposes students to new ideas.³⁶

3.2 Scaffolding

TBL was incorporated into a scaffolding approach to teaching.³⁷ Scaffolding involves the provision of adequate support to promote learning.³⁸ This experiment broadly follows the definition of scaffolding provided by Dickson, Chard and Simmons as “the sequencing of prompted content, materials, tasks and teacher and peer support to optimise learning”.³⁹ In this experiment scaffolding is transitory, as student support is withdrawn in respect of the case study to facilitate deeper student learning and research skills.

As part of scaffolding a reflections assignment was set for students to reflect on their own performance and that of their team members. McAlpine, Reidsema and Allen found such feedback enhanced students’ awareness of team processes and aided their understanding that they needed to contribute to the team.⁴⁰ Abraham also established that such student-centred blended learning approach enhanced student motivation and student grades.⁴¹

3.3 Blended Learning

³⁴ L K Michaelsen, R H Black, L D Fink, ‘What every faculty developer needs to know about learning groups’ in (Richlin ed) *To improve the Academy: resources for faculty instructional and organizational development* (1996) Stillwater, O.K., New Forums Press Co, 31.

³⁵ Michaelsen above n 17.

³⁶ Ibid.

³⁷ Abraham Jones above n 11, 3: Noting that over fifty years ago Bruner further developed the Vygotsky assumptions about learning (discussed previously) and introduced scaffolding in the context of teaching oral language to young children.

³⁸ Ibid.

³⁹ S V Dickson, D J Chard and D C Simmons, ‘An integrated reading/writing curriculum: A focus on scaffolding’ (1993) 18(4) *LD Forum* 12, 12.

⁴⁰ L McAlpine, C Reidsema and B ‘Allen, Educational design and online support for an innovative project-based course in engineering design’, in L Markauskaite, P Goodyear & P Reimann (Eds.), *Proceedings of the 23rd Annual ASCILITE Conference: Who's learning? Whose technology?* (2006), University of Sydney: Sydney University Press, Centre for Research on Computer Supported Learning and Cognition, 497-507.

Further, the experiment adopted a blended learning environment (that involves face to face and online teaching). Carmody and Berge found this promotes student centred learning and fosters increased student interaction.⁴² Graham, Allen and Ure similarly established that a blended approach improves pedagogy, flexibility and student access.⁴³

The experiment also follows the three elements of effective assessment as set out by McMillan.⁴⁴ That is, good assessments utilise multiple methods, are efficient and feasible; and employs technology.

4. The taxation law TBL experiment

The TBL experiment involved a comparison in teaching mainly undergraduate accounting students in semester 1 of 2009 (when TBL was not used) and semester 1 of 2010 and 2012 (when TBL was used). Some of the students were law students (about 10 per cent). The teams were provided with face to face TBL and scaffolding in a blended learning environment.

4.1 Team Based Learning

In 2012 teams of about 4 students were required to submit at semester end a 3,000 word real world type case study on a business involving complex income tax issues and the goods and services tax. This assignment utilised a blended learning environment with support through scaffolding. In an online environment students needed to research the tax issues using on line data bases provided by large law publishers and the Australian Taxation Office. The case study developed analytical, problem solving skills and legal

⁴¹ A Abraham, 'Teaching accounting using student-centred pedagogy: A blended learning versus a traditional approach' (2008) *AFAANZ Conference Proceedings*. 7-9 July. Sydney, Australia: 1-27.

⁴² K Carmody and Z Berge, 'Elemental analysis of the online learning experience' (2005) 1 *International Journal of Education and Development using Information and Communication Technology* 108-119.

⁴³ C R Graham, S Allen and D Ure 'Benefits and challenges of blended learning environments' in M Khosrow-Pour (Ed.), *Encyclopedia of Information Science and Technology* (2005) Hershey, PA: Idea Group, 253-259.

writing skills. Some of the issues did not have clear answers so as to encourage discussion and analysis by teams. The case study was worth 25 per cent of the students' assessment. Team members remained unchanged during the semester.⁴⁵

In 2010 and 2012, TBL multiple choice questions (MCQ) were provided to the same 4 member teams in tutorials. The 50 minute tutorials for the introductory taxation topic ran over 12 weeks (1 tute per week) during semester 1 in 2009, 2010 and 2012. The author and other tutors presented these tutorials. In 2009 the tutorials were conducted without TBL and student participation was not assessed. The tutorials were largely tutor based, with tutor didactically providing answers and with some prompting of students for answers and class discussion. The tutors' dominated the discussion talking for approximately 40 to 45 minutes out of the 50 minute tutorial.

TBL was used in the experiment years, 2010 and 2012, The TBL tutorial exercise involved about four MCQs. These MCQs took teams about 15-20 minutes to answer. Ascertaining the teams' MCQ answers and discussion accounted for a further 5-10 minutes of the tutorial. The remainder of the tutorial time (a period of about 20 minutes) involved the tutor providing answers and with significant student discussion.

MCQ sheets were handed out to each team at the beginning of each tutorial and the group was given about 15-20 minutes to ascertain answers. The MCQ questions had 5 possible answers A, B, C, D and E. Each group were provided with 5 large cards marked: A, B, C, D and E. The teams were advised that the questions must be handed back to the tutor after the exercise concluded and that they could not write on the questions (so that questions could not be passed onto other classes). Teams who failed to follow this advice were advised that they would lose marks for failing to follow instructions.

At the end of the allocated time, the groups were asked to simultaneously hold up the card with the best answer for each question in turn. The tutor noted the teams' answers

⁴⁴ J McMillan, 'Fundamental assessment principle for teachers and school administrators' (2000) 7(8) *Practical Assessment, Research and Evaluation* 1-8.

⁴⁵ Some minor changes arose when a small number of students ceased attending tutorials.

and a score of one point was awarded for each correct MCQ answer. Over the ten weeks of tutorial tests 37 MCQ questions were provided to teams. Individuals were assessed on their team's MCQ test results and their individual level of participation, which formed ten per cent of the overall topic assessment.

The provision of extensive and timely feedback was a key feature of TBL MCQs. After each question the tutor provided an explanation for the correct answer and invited discussion. Further, feedback on the importance of individual participation was stressed during the semester particularly in the first six weeks. For example, students were advised that a high distinction performance would need participation at a high distinction level as well as high distinction technical performance. During tutorials extensive oral feedback was provided at a team level to indicate the participation performance of teams (thereby avoiding individual criticisms that may embarrass students). Teams who declined to participate were advised that they would receive a lower mark for their ten per cent tutorial assessment.

The teams (without individual member names) were listed on the topic's intranet site which was accessible by all students. After week six of semester one, the teams were divided into different leagues. The distinction and above teams were allocated to the Premiership, the other students were allocated to the Championship. International student teams were also listed in an International League. League tables and technical point scores were published in week 6 (a team score out of 21 MCQs) and in week 12 (a team score out of 16 MCQs), totalling a mark out of 37 MCQs. The winning teams of the three leagues received small prizes of blocks of chocolate. Team photos were taken of the winning teams and (with written permission of team members) these photos were published on the intranet. In the last tutorial in week 12, brief written team feedback was provided and a grade awarded to each team based on the teams' technical performance, team work and participation. After week 12 each individual's grade was confidentially published on the topic's intranet site that took into account their team grade and their individual participation.

This experiment generally followed Michaelsen’s theoretical guidelines noted above. The experiment promoted ongoing accountability for teams (by the MCQ tests and case study) and individuals (by the participation grades). Also, the experiment involved linked and mutually reinforcing assignments at the individual work stage, the TBL stage and the total class discussion stage of the teaching process. Further, the 3 ‘S’s’ were followed. Teams were given the same MCQ tests and case study involving groups using topic concepts to make a specific choice. The groups were required to report simultaneously. Students needed to use course concepts to make difficult choices. The experiment used permanent groups, MCQ tests, a case study and a grading system. All of the MCQ work was conducted in the classroom and diverse groups of 4-5 students were created.

Additionally, the individual members of teams were required to complete a reflections assignment worth 5 per cent of their assessment.

4.2 Scaffolding

The experiment provided scaffolding for student support during the semester. The following diagram sets out the assessment stages of scaffolding:

Diagram 1: Scaffolded Assessment Stages

6. Teacher feedback to individuals and teams
5. Individuals students submit Reflections Assignment
4. Teams analyse, research and discuss, provide written submission for case study
3. Planning by teams for case study
2. TBL case study problem allocated,

explained by teacher
1. Weekly tutorial TBL quizzes set with instant feedback provided by teacher

4.3 Blended Learning

A blended learning environment was provided with the use of online lecture videos and provision of topic information and case study guides on the university intranet. As noted above, the case study required students to access online tax law data bases.

5. Assessing Effectiveness of the Teaching Innovation

5.1 Teachers' Classroom Observations

From the author's observations of TBL it was clear that the students enjoyed working in teams during tutorial MCQ tests. Initially the level of team verbal class participation and discussion was rather low but this improved significantly over the semester. The standard of team participation was generally lower than the level of technical performance. The increased level of discussion by students and TBL helped to inject a sense of fun, interest and dynamism into the tutorials. Tutorial attendance was significantly higher with TBL. Prior to TBL, the tutorials were mainly characterised by the one way dialogue of teachers. The student evaluations of teaching also reflected a high level of student satisfaction under TBL.⁴⁶ Although, this level of satisfaction was similar to 2009 when TBL was not used.⁴⁷

A tutor in the topic in both years of the experiment observed:⁴⁸

⁴⁶ See Appendix 1: This table of student evaluations shows a high level of student satisfaction in results in 2010 when TBL was implemented in accordance with the above research of Michaelsen and Fink.

⁴⁷ Ibid.

⁴⁸ T Trimboli, Email dated 22 March 2011. Trimboli is a part time tutor in taxation law at Flinders University since 2004.

The impact on students was a positive one because the competitive nature of the TBL approach generated more enthusiasm and interest in the tutorial class. It provide a "light" and entertaining relief from the normal procedure which the students enjoyed and looked forward to each week. Students were more likely to attend the tute because the TBL questions formed part of the overall assessment. Also a good practical learning experience for the students as they have to work as a team and make decisions by discussion and consensus.

In respect of the case study it was difficult for teachers to observe students working in teams since this work was mainly performed outside of the classroom.

Teachers are of course crucial to effective student learning. There are substantial benefits for university teachers since TBL can transform the joy of teaching. Stress and boredom are greatly reduced by the high levels of student participation (especially in repeated classes). As discussed previously, the lack of participation has been a perennial issue in teaching accounting students. Thus, TBL facilitates a more enjoyable learning experience for students.

5.2 Student Performance in Team Based Tutorial Assessment

In respect of tutorial assessment, the high technical performance of teams during semester 1 in 2010 provides some evidence that that TBL is effective. The following table outlines the performance of teams in weeks 2-6 and 7-11:⁴⁹

Table 1: Performance of teams in MCQ tests, weeks 2-6 and 7-11

Team	Weeks 2-6 /21 Score	% Score	Weeks 7-11 /16 Score	% Score	% Change weeks 2-6 to 7-11	Overall score /37	Overall % Score

⁴⁹ No MCQ tests were held in weeks 1 and 12.

1	19	90%	15	94%	104%	34	92%
2	19	90%	12	75%	83%	31	84%
3	18	86%	16	100%	117%	34	92%
4	18	86%	15	94%	109%	33	89%
5	18	86%	12	75%	88%	30	81%
6	18	86%	15	94%	109%	33	89%
7	18	86%	12	75%	88%	30	81%
8	18	86%	13	81%	95%	31	84%
9	18	86%	14	88%	102%	32	86%
	17	81%	13	81%	100%	30	81%
11	17	81%	15	94%	116%	32	86%
12	17	81%	10	63%	77%	27	73%
13	16	76%	13	81%	107%	29	78%
14	16	76%	14	88%	115%	30	81%
15	16	76%	11	69%	90%	27	73%
16	16	76%	12	75%	98%	28	76%
17	16	76%	11	69%	90%	27	73%
18	16	76%	14	88%	115%	30	81%
19	16	76%	16	100%	131%	32	86%
20	16	76%	15	94%	123%	31	84%
21	16	76%	15	94%	123%	31	84%
22	15	71%	15	94%	131%	30	81%
23	15	71%	14	88%	123%	29	78%
24	15	71%	12	75%	105%	27	73%
25	15	71%	15	94%	131%	30	81%
26	15	71%	12	75%	105%	27	73%
27	14	67%	16	100%	150%	30	81%
28	14	67%	10	63%	94%	24	65%
29	13	62%	12	75%	121%	25	68%

30	13	62%	13	81%	131%	26	70%
31	12	57%	9	56%	98%	21	57%
32	11	52%	10	63%	119%	21	57%
33	11	52%	13	81%	155%	24	65%
34	11	52%	7	44%	84%	18	49%
35	10	48%	16	100%	210%	26	70%
36	6	29%	9	56%	197%	15	41%
Average score	15.2	73%	12.9	81%	11%	28.2	76%

The 36 teams engaged in TBL averaged 73 per cent correct MCQ answers at the end of the first 5 weeks of tests (total of 5 tests). At the end of the 5 tests in weeks 7-11, the teams averaged 81 per cent correct MCQ answers, an improvement of 11 per cent compared to weeks 1-5. This further suggests that TBL works to improve student performance over the course of the semester. Although, other factors may have resulted in this improvement such as differences in the complexity of MCQ tests and the learning effect from practice in MCQ tests.

5.3 Student Performance in Mid Year Exam

The mid year exam in the 2009 and 2010 years both consisted of an identical 35 question multiple choice test. The following table outlines student performance in the two experiment years:

Table 2: Analysis of mid year exam performance 2009 and 2010 years

	Fail %	Pass %	Credit %	Distinction %	High Distinction %
2009 (204)	2	16	27	27	27

students)					
2010 (146 students)	1	26	40	24	9

The above table shows that the TBL in 2010 was accompanied by a significant deterioration in the percentage of high distinction students. TBL resulted in more students with pass and credit grades. This, though, may also be possibly explained by a significantly higher level of student quality in 2009 than 2010.

5.4 Student Performance in Final Year Exam

The final exam in the 2009 and 2010 years both involved 2 hour exam papers with similar formats and identical weightings for the components of the exam.⁵⁰ The following table outlines student performance in the two experiment years:

Table 3: Analysis of final exam performance 2009 and 2010 years

	Fail (Did not sit exam) %	Fail %	Pass %	Credit %	Distinction %	High Distinction %
2009 (202 students)	10	15	29	28	16	2
2010 (160)	13	19	26	24	16	2

⁵⁰ The questions were:

Part 1

1. Assessable income 20 per cent
2. Deductions 20 per cent
3. Depreciation 10 per cent

Part 2 (students had a choice of 2 or these 3 questions)

4. MCQ 25 per cent
5. Capital gains tax 25 per cent
6. Case law question 25 per cent

students)						
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It appears that the introduction of TBL failed to have a positive impact on exam performance since the 2010 TBL exam was associated with a slight worsening of fail, pass and credit grades compared to 2009 exam. Distinction and high distinction percentages were identical between years. Although, other factors may have influenced relative exam performance between years such as differences in exam complexity and student quality.

However, the relative performance by the TBL students in the 2010 exam to the 2009 exam is much improved compared to their relative performance in the mid semester 2010 exam to the 2009 exam, as noted above. This again seems to suggest that TBL works to improve student performance over the course of the semester (as seen with the in class MCQ tests). This finding is quite tentative given the differences in exam complexity and student quality over the two years.

5.5 Reflections Assignment

The reflections assignment⁵¹ enabled students to reflect on their own performance and that of their team members. This provided important feedback for the teachers. Out of 118 students, 105 submitted this assignment. Answers to the following key questions on TBL are set out in the table below.

Table 4: Key Data Team Based Learning Survey Results

Percentage of students who had no prior group work experience	1%
Average no of meetings	4.7
Average time per meetings	1 hour 38 Minutes

⁵¹ The reflections assignment was based on an assignment provided by in 2011 by A Abraham, School of Accounting, College of Business and Law, University of Western Sydney.

Total average time in meetings	7 hours 18 minutes
Average no of team members	3-4
Percentage of teams that had a leader	41%

The survey shows that all students but one had prior group work experience. Clearly the students took the assignment seriously, with an average of 4.7 meetings that totalled an average time of 7 hours 18 minutes. A significant number of teams (41 per cent) developed leaders. This strong level of team engagement highlights the advantages of face to face teaching over online courses.

Additionally, the students had to rate each aspect of the questions below in terms of the description at each end of the scale by putting an “X” in the most appropriate box.

Table 5: Likert Scale Questions on Team Harmony and Performance

	1		2		3		4	
1.Members were suspicious of each other						x		High degree of mutual trust in the group
2.Everyone worked for themselves						x		Genuine support for each other
3.Communication was guarded and cautious						x		Communication was authentic and open
4.One member dominated the group					x			All members participated equally
5.The project was clearly understood			x					The project was not clearly understood
6.Group was negative towards project						x		Group was committed to project
7.Group denied, avoided or suppressed conflict						x		Group brought out conflicts and worked through them
8.My ideas, abilities, knowledge and experience were not properly drawn out and not properly used						x		My ideas, abilities, knowledge and experience were properly drawn out and used
9.Group had no set strategies for the task						x		Group had set strategies for the task
10.Strategies were not successful						x		Strategies were successful
11.Time management was a problem for the group					x			Time was not a problem for the group

12.We had the same ideas about the questions				x			We had different approaches to answering the questions
13.Other people's ideas did not help my understanding						x	Other people's ideas helped me to understand the material better
14.One person could have done the assignment best						x	2 or 3 minds are more effective than one
15.The sharing of ideas and the discussions did not lead to better understanding						x	The sharing of ideas and the discussions lead to better understanding
16.It did not teach us to cooperate within a team						x	It taught us how to cooperate within a team
17.We always agreed about what to do					x		We compromised to form a united decision
18.We did not explain information to each other						x	We explained information to each other
19.I did not help my team members learn						x	I helped my team members learn
20.Individual knowledge was sufficient						x	Collective knowledge was greater than individual knowledge
21.I did not feel any accountability to my group						x	I felt accountability to my group
22.The group process did not promote learning						x	The process enabled members to learn from each other

This survey shows that the teams worked in harmony and performed well in the MCQs and case studies as seen by the average 3.5 out of 4 ratings given for 17 out of the 22 questions. There were also good ratings (average 3 out of 4) for: members participating equally, time management, and the ability to compromise.

There was a mixed response (average 2.5 out of 4) about whether the team members had the same ideas or not in answering questions. This appears to be indicative of the complexity of the TBL MCQs and case study.

The survey also provided valuable feedback for teachers on the level of student support, as the rating for understanding the case study was relatively low (average 2 out of 4). This appears to reflect (at least in part) the deliberate removal of scaffolding and the complexity of the case study research tasks. A number of students have difficulty in learning how to use the ATO legal data base and law publishers database and/ or do not appreciate the time intensive nature of this task.

Additionally, the students were asked a series of questions to reflect upon their experience with TBL. The student feedback gave further insights into the skills obtained through face to face team work. One student noted:

“Sometimes I just cannot consider questions comprehensively and my group members help me. Every member explains their options while we discuss, this really helps a lot”

Another student stated:

“The particular group worked well together and were committed to the project, so meetings and discussions were fruitful, constructive and everyone respected each other’s commitment. The shares ideas and the prospect of not working alone that there is someone else to bounce ideas off and share the load. Sometimes working alone is a bit narrow and having other people to gice ideas makes you expand your thinking.”

6. Conclusion

Comparisons of student performance in the assessment in the two comparison years produced mixed results. Examining assessments is inconclusive given the differences between the two cohorts and test / exam complexity. The student survey, though, provides a lucid view of the impact of the teaching innovation. This survey clearly

illustrates the effectiveness of the use of face to face TBL, scaffolding and blended learning.

Further, the student survey results show that the face to face aspects of this teaching innovation developed key workplace skills that are not attainable in an online only environment. Students learned how to work in teams in harmony and effectively. A significant number of students developed leadership skills. In line with the research the survey showed that TBL aids educational outcomes and the students' ability to apply content. TBL was associated with significantly higher levels of student engagement, participation and attendance. Student satisfaction was high. TBL encouraged student group development, generic skills and this assists employers.

Importantly, there are also substantial benefits for university teachers as TBL transforms the joy of teaching. This reduces teacher stress and boredom (especially in repeated classes) and facilitates a more enjoyable learning experience for students.

Appendix 1

Table 1: Tutorial SETS in undergraduate taxation law in 2008 and 2010

2008											
SETS criteria	1	2	3	4	5	6	7	8	9	10	11
Mean	6.7	6.5	6.4	6.4	6.4	6.2	6.3	6.5	6.4	6.4	6.5
2010											
SETS criteria	1	2	3	4	5	6	7	8	9	10	11
Mean	6.6	6.4	6.4	6.5	6.4	6.3	6.3	6.5	6.5	6.6	6.6