Team Based Learning and the Performance of Accounting Undergraduates

Abstract

This paper examines an experiment in team based learning (TBL) undertaken with undergraduate accounting students studying taxation law. Research indicates that TBL aids educational outcomes and the students’ ability to apply content. This undergraduate taxation law teaching experiment produced mixed results. However, there are clear benefits from TBL. 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 substantial benefits for university teachers as TBL transforms the joy of teaching.

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Team Based Learning and the Performance of Accounting Undergraduates

1. Introduction

This paper analyses the findings of an experiment in the use of team based learning (herein after referred to as TBL) to improve the performance of undergraduate accounting students. Innovation and the acceptance of new teaching methods is increasingly trend in Australian accounting schools. Such changes address the challenges of: new technologies, large class sizes, diversity of the student population (often characterised by a significant international student cohort), the increasing complexity of the topics (such as taxation law) and the growing pressures on school funding and teaching resources. The move towards greater accountability for research outputs also places added time pressure on academics to maintain teaching quality.\(^1\)

This TBL experiment was conducted on final year accounting university students studying an introductory taxation law topic covering taxation policy, goods and services tax and income tax. There is no known research into the use of TBL to improve the performance of undergraduate accounting students, so this experiment attempts to fill this void.

First, this paper defines team based learning and examines the mooted benefits. The paper then provides a theoretical underpinning for the TBL experiment. The TBL experiment is detailed and then its findings are analysed.

Research indicates that TBL aids educational outcomes and the students’ ability to apply content this undergraduate taxation law teaching experiment produced mixed results. However, there are clear benefits from TBL. 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

\(^1\) Additionally, there is a demand by employers for employees that can effectively work in teams.
employers. Importantly, there are substantial benefits for university teachers as TBL transforms the joy of teaching.

2. Defining Team Based Learning

In a university context there are a number of definitions for TBL. Michaelsen et al defined team learning as ‘extensive classroom use of permanent, heterogeneous, six or seven member student work teams to accomplish learning objectives’.Whilst, Fink 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’.

3. Benefits of TBL

The following research suggests that TBL may improve the performance of undergraduate student performance. Michaelsen found that TBL aids educational outcomes and results in high satisfaction levels for students.Fink similarly observed that TBL assists students understanding of content and their ability to apply content. 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

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5 Fink above n 3.
analytical thinking skills. Michaelsen et al found that TBL also improves the effectiveness of teaching large class sizes.

The lack of student participation is a pervasive problem in university tutorials. In particular this is a real issue for accounting students. The Accounting Education Change Commission has called for students to be active participants in classes rather than passive recipients of learning. 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. The greater levels of satisfaction of university teachers would also appear to positively impact on their teaching and thus assist student performance.

3. Theoretical guidelines for TBL experiment

This experiment is based on a model provided by Michaelsen. 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. The following three keys are considered to be important to the effectiveness of such group learning.

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6 Fink above n 3.
7 Michaelsen, Watson, Cragin, Fink above n 2.
9 Keddie and Trotter above n 8.
11 Fink above n 3, Michaelsen above n 4.
12 Michaelsen above n 4.
13 Ibid.
First, promoting ongoing accountability is vital to prevent under preparation by students and the group work becoming a social event.\textsuperscript{14} Thus individuals and groups should be set tasks and assessed on their success.\textsuperscript{15} 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.\textsuperscript{16} To optimise the impact on learning, assignments should be characterised by three S’s: same problem; specific choice and simultaneously report.\textsuperscript{17} 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.\textsuperscript{18} For assignments this can be achieved by providing tasks that require group interaction.\textsuperscript{19} For example, require students to use course concepts to make difficult choices.\textsuperscript{20} Barriers to participation can be alleviated by using permanent groups, assignments and a grading system that encourages group development.\textsuperscript{21} Work in the classroom is preferred given the time constraints and difficulties for students to meet outside of class that will limit any serious

\textsuperscript{14} Ibid.
\textsuperscript{15} Ibid.
\textsuperscript{16} Ibid.
\textsuperscript{17} Ibid.
\textsuperscript{18} Ibid.
\textsuperscript{19} Ibid.
\textsuperscript{20} Ibid.
\textsuperscript{21} L K Michaelsen, R H Black, L D Fink, ‘What every faculty developer needs to know about learning groups’ in (Richlin ed) \textit{To improve the Academy: resources for faculty instructional and organizational development} (1996) Stillwater, O.K., New Forums Press Co, 31.
group work. Creating diverse groups of 5-7 individuals exposes students to new ideas.

3. The taxation law TBL experiment

The TBL experiment involved a comparison in teaching mainly undergraduate accounting students in tutorials in the 2009 and 2010 years. Some of the students were law students (about 10 per cent). The 50 minute tutorials for the introductory taxation topic ran over 12 weeks (1 tute per week) during semester 1 of both years. The author and other tutors presented these tutorials in 2009 and 2010.

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 introduced in 2010 with students allocated in teams of 4-5 students in each tutorial (usually 4 teams per tute group). The TBL exercise involved about four multiple choice questions (hereinafter known as “MCQ”) in each tutorial. 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.

The group members remained unchanged during the teaching semester. 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.

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22 Michaelsen above n 4.
23 Ibid.
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 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. 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

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24 Some minor changes arose when a small number of students ceased attending tutorials.
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 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 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 and a grading system. All of the work was conducted in the classroom and diverse groups of 4-5 students were created.

4. Analysis of Findings on Student Performance

4.1 Teachers’ Impressions

From the author’s observations of TBL it was clear that the students enjoyed working in teams. 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.\textsuperscript{25} Although, this level of satisfaction was similar to 2009 when TBL was not used.\textsuperscript{26}

A tutor in the topic in both years of the experiment observed: \textsuperscript{27}

> 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.

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.

\subsection*{4.2 Student Performance in Team Based Tutorial Assessment}

\textsuperscript{25} 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.
\textsuperscript{26} Ibid.
\textsuperscript{27} T Trimboli, Email dated 22 March 2011. Trimboli is a part time tutor in taxation law at Flinders University since 2004.
In respect of tutorial assessment, the high technical performance of teams during semester 1 in 2010 provides some evidence that TBL is effective. The following table outlines the performance of teams in weeks 2-6 and 7-11:

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

<table>
<thead>
<tr>
<th>Team</th>
<th>Weeks 2-6 /21 Score</th>
<th>% Score</th>
<th>Weeks 7-11 /16 Score</th>
<th>% Score</th>
<th>% Change weeks 2-6 to 7-11</th>
<th>Overall score /37</th>
<th>Overall % Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>19</td>
<td>90%</td>
<td>15</td>
<td>94%</td>
<td>104%</td>
<td>34</td>
<td>92%</td>
</tr>
<tr>
<td>2</td>
<td>19</td>
<td>90%</td>
<td>12</td>
<td>75%</td>
<td>83%</td>
<td>31</td>
<td>84%</td>
</tr>
<tr>
<td>3</td>
<td>18</td>
<td>86%</td>
<td>16</td>
<td>100%</td>
<td>117%</td>
<td>34</td>
<td>92%</td>
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<tr>
<td>4</td>
<td>18</td>
<td>86%</td>
<td>15</td>
<td>94%</td>
<td>109%</td>
<td>33</td>
<td>89%</td>
</tr>
<tr>
<td>5</td>
<td>18</td>
<td>86%</td>
<td>12</td>
<td>75%</td>
<td>88%</td>
<td>30</td>
<td>81%</td>
</tr>
<tr>
<td>6</td>
<td>18</td>
<td>86%</td>
<td>15</td>
<td>94%</td>
<td>109%</td>
<td>33</td>
<td>89%</td>
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<tr>
<td>7</td>
<td>18</td>
<td>86%</td>
<td>12</td>
<td>75%</td>
<td>88%</td>
<td>30</td>
<td>81%</td>
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<td>8</td>
<td>18</td>
<td>86%</td>
<td>13</td>
<td>81%</td>
<td>95%</td>
<td>31</td>
<td>84%</td>
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<td>18</td>
<td>86%</td>
<td>14</td>
<td>88%</td>
<td>102%</td>
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<td>10</td>
<td>17</td>
<td>81%</td>
<td>13</td>
<td>81%</td>
<td>100%</td>
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<td>81%</td>
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<tr>
<td>11</td>
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<td>73%</td>
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<td>18</td>
<td>16</td>
<td>76%</td>
<td>14</td>
<td>88%</td>
<td>115%</td>
<td>30</td>
<td>81%</td>
</tr>
</tbody>
</table>

\[^28\] No MCQ tests were held in weeks 1 and 12.
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. More research and testing is needed to confirm the impact of TBL on MCQ performance.
4.3 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

<table>
<thead>
<tr>
<th></th>
<th>Fail %</th>
<th>Pass %</th>
<th>Credit %</th>
<th>Distinction %</th>
<th>High Distinction %</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>2</td>
<td>16</td>
<td>27</td>
<td>27</td>
<td>27</td>
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<tr>
<td>(204</td>
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<tr>
<td>students)</td>
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<tr>
<td>2010</td>
<td>1</td>
<td>26</td>
<td>40</td>
<td>24</td>
<td>9</td>
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<tr>
<td>(146</td>
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<tr>
<td>students)</td>
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</tbody>
</table>

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.

4.4 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. The following table outlines student performance in the two experiment years:

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29 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)**
Table 3: Analysis of final exam performance 2009 and 2010 years

<table>
<thead>
<tr>
<th></th>
<th>Fail (Did not sit exam) %</th>
<th>Fail %</th>
<th>Pass %</th>
<th>Credit %</th>
<th>Distinction %</th>
<th>High Distinction %</th>
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</thead>
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<td>2009</td>
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<td>10</td>
<td>15</td>
<td>29</td>
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<td>13</td>
<td>19</td>
<td>26</td>
<td>24</td>
<td>16</td>
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</table>

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. Conclusion

4. MCQ 25 per cent
5. Capital gains tax 25 per cent
6. Case law question 25 per cent
Whilst research indicates that TBL aids educational outcomes and the students’ ability to apply content this undergraduate taxation law teaching experiment using the Michaelsen’s TBL guidelines produced mixed results.

TBL appeared to be effective in improving student performance over the course of the semester as seen by the improvement in the in class MCQ results and the relative improvement in the mid to final exam results. However, the introduction of TBL was associated with a significantly lower level of achievement in the 2010 mid semester exam compared to the 2009 exam. Further, TBL was also associated with a slightly diminished level of achievement in the 2010 final exam compared to 2009. Overall, the impact of TBL on student performance in the MCQ tests, the assignment and the exam performance is inconclusive given the differences between the two cohorts and test / exam complexity. More research is needed to account for these differences so as to verify these findings.

However, there are clear benefits from TBL. 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 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

<table>
<thead>
<tr>
<th></th>
<th>2008</th>
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