The Effects of Team-Based Learning on Students' Attitudes and Students' Performances in Introductory Sociology Classes

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The Effects of Team-Based Learning on Students’ Attitudes and Students’ Performances in Introductory Sociology Classes

Abstract: Relevant in many academic contexts, recent scholarship in sociology has challenged departments to improve the public face of the discipline through introductory classes. However, this scholarship has not addressed how departments can improve the discipline’s public face while maintaining student performance. It is one thing to create an engaging introductory class; it is another to create an engaging introductory class that ensures student learning. One way to possibly achieve the latter is to implement innovative instructional methods that promote active learning. As documented in various fields, one such method is Team-Based Learning (TBL), an active-learning strategy that uses student groups to teach concepts and their applications. Literature has highlighted the success of TBL on students’ perceptions of classes, but reported ambiguous results concerning improved students’ performances. In this article we deviate from previous research, by examining the effect of TBL on students’ attitudes toward sociology (e.g. the public face of the discipline) as well as students’ performances. Results indicate that, as opposed to lecture-based classes, students in TBL classes have much more positive attitudes toward the discipline, while demonstrating equivalent performances. Consequently, we argue that, as long as students’ performances are maintained, academic departments should put time and effort into converting introductory courses into environments of active learning in order to improve the discipline’s public face.
**Keywords: Active Learning, Students’ Attitudes, Students’ Performances, Team-based Learning**

For many students introductory classes are the primary, if not only, interaction they will have with academic disciplines. Given this reality, recent scholarship of teaching and learning in sociology challenges sociology departments to reconsider the ways in which they teach introductory classes (Zipp, 2012; Greenwood and Howard 2011, Greenwood, 2013). Zipp (2012) reasons that departments should view introductory classes as the discipline’s “public face,” reconfiguring classes to incorporate student centered approaches. Nevertheless, even despite this suggestion, Zipp (2012) notes the “uneasy tension” (p. 309) that exists between implementing student centered instructional methods and the assurance that students will learn concepts required for upper division classes. In other words, it is one thing to create an engaging introductory class; it is another to create an engaging introductory class that ensures student learning. Accordingly, introductory sociology classes, and by extension all introductory classes, should have two specific objectives: (1) improve the public face of the discipline; and (2) ensure that students have the competency to succeed in future discipline-specific classes. Achieving a balance between these two objectives can be difficult.

Nonetheless, recent literature has stressed the incorporation of active learning methods in college classes in order to improve student engagement (Parmer and Trotter, 2004; Atkinson and Hunt, 2008; Bowen et al., 2011); implicitly striking the balance between the aforementioned objectives. One such method is Team-Based Learning (TBL), an active-learning strategy that uses student groups to teach concepts and their applications. As a faculty member at the University of Oklahoma in the 1970’s, Larry Michaelson developed TBL against advice from his
colleagues, to adopt group work over lecturing as the method of instruction in his classes, which were tripling in size (Michaelson, 2004a). Through reflection and multiple iterations Michaelson ultimately refined his methods of instruction into the present TBL process. Fink (2004), who researches collegiate teaching and is coeditor of *Team-Based Learning: A Transformative Use of Small Groups in College Teaching*, defines TBL as “a particular instructional strategy that is designed to (a) support the development of high performance learning teams and (b) provide opportunities for these teams to engage in significant learning tasks” (p. 9). Given this definition, Fink (2004) argues that TBL is distinctive from other forms of cooperative learning because it (1) employs “teams,” as opposed to groups, and (2) is implemented as a long-term instructional strategy. Teams, in this sense, are different from groups in that they demand a higher level of commitment to the welfare of the group and consequently a higher level of trust among the group members (Fink, 2004). Practically speaking, teams form out of groups made up of a small number of students who meet regularly and are held accountable not only as a team, but also as individuals working on a team. To establish and maintain team cohesion, four essential principles govern the TBL process: 1) proper formation and management of teams; (2) accountability for team and individual work; (3) assignment design that promotes learning and team development; and (4) frequent and timely feedback (Michaelson, 2004b; Michaelson and Sweet, 2008).

As demonstrated in various disciplines (Letassy et al., 2008; Beatty et al., 2009; Carmicheal, 2009; Malone and Spieth, 2012), TBL has had a significant effect on student engagement and perceptions of learning. Letassy et al. (2008) demonstrate that TBL increased student engagement in a pharmaceutical course and concludes that TBL is an effective active-learning strategy for distance learning classes. These results are supported by Haberyan (2007)
who notes that students in a TBL psychology class exhibited more student-to-student and student-to-instructor engagement. Additionally, Carmichael (2009) reports that students in a large biology class valued the TBL structure, noting that 86 percent of students had positive comments citing how TBL aided their learning. In another case, Beatty et al. (2009) records that more than 74 percent of students who worked in a TBL structured pharmaceutical workshop felt that teams helped them better understand course material, gave them better knowledge, reinforced individual learning, and felt that TBL workshops should continue. Similarly, when compared to lecture based courses students found TBL to be more effective for applying course information, interesting, motivating, enjoyable, and fun (Haberyan 2007).

However, results are mixed when examining students’ performances. On the one hand, Beatty et al. (2009) report that high-level learning occurred within student teams and Haberyan (2007) notes that students in the TBL class tended to have overall better grades when compared to students in a lecture-based course. Yet, on the other hand, Carmichael (2009) demonstrates that students in his TBL classroom had better in-semester exam grades when compared to students in lecture-based classes but did not have significantly different scores on the final exam. Likewise, Malone and Spieth (2012) note that students in a TBL experimental group did not out-perform students in a lecture-based control group on the class final exam, but, over consecutive years, did retain significantly more content. These contradictory reports can be explained by the unit used to measure students’ performances in each of these studies. For instance Beatty et al. (2009) drew conclusions based on comparisons between individual and group performances on readiness assessment tests. Haberyan (2007) anecdotally compared final course grades between TBL and lecture-based classes from different semesters; whereas Carmichael (2009), as well as
Malone and Spieth (2012), examined students’ final exam scores between TBL and lecture-based classes or experimental groups within the same semester.

As opposed to previous research, we shift the focus from the effects of TBL on student engagement, to the effects of TBL on students’ attitudes toward the discipline, the latter of which we treat as an indicator of the discipline’s public face. Nonetheless, as with previous research, we are still interested in students’ performances, but not necessarily performance improvement. Given the ambiguous results of students’ performances in TBL classes, for this paper we would like to know whether or not students in TBL classes can achieve equivalent performances as students in classes that utilize lecture-based learning (LBL). In this sense, we are not concerned with improving students’ grades; rather, we are concerned that students achieve a level of content knowledge that they might achieve in traditional lecture-based classes. Therefore, the specific aim of this research is to examine the effect of TBL, as opposed to LBL, on students’ attitudes toward sociology and students’ performances in introductory sociological classes.

This research is significant because it provides practical information for academic departments if they follow Zipp’s (2012) advice, improving the public face of a discipline through introductory classes while ensuring that a particular level of student learning is achieved. Given our aim and claim of significance, this paper is organized into three sections. The first section details our research methods, including our hypotheses, our analysis plan, and a description of the LBL and TBL classes used as sites for our research. The second section reports our findings, which is followed in the third section by a discussion of the results. We conclude this paper by giving some general comments about the study and direction for future research.

**Methods**
Hypotheses

Despite the documented effect of TBL on students’ performances and attitudes in other disciplines, it is not clear whether these results will repeat in sociology classes. To our knowledge the only documentation of a TBL sociology classroom is a memoir of instructors’ challenges when implementing the teaching strategy (Hunter and Robinson, 2012). Although this resource does provide a basis for the utility of TBL in sociology, it does not provide an analysis of TBL effectiveness. Therefore, for the purposes of this research, we will use a null hypothesis format. Our research hypotheses are:

Hypothesis #1: There is no difference in students’ attitudes toward sociology between TBL and LBL classes

Hypothesis #2: There is no difference in students’ performances between TBL and LBL classes.

Analysis Plan

To determine whether we can accept or reject the hypotheses, this study employed a static-group comparison design, in which post-treatment scores are compared between a control group (LBL) and an experimental group (TBL). Both sets of classes were introductory courses at a branch campus of a large mid-western university that met once a week for two hours and forty minutes over the fall and winter quarters of the 2011-2012 academic year. All classes met on the same day of the week. During the fall quarter the TBL class met in the evening; whereas the LBL class met in the afternoon. Since evening classes draw a large segment of non-traditional students the arrangement was reversed during the winter quarter such that the TBL class met in the afternoon and the LBL class met in the evening.
The same instructor taught every class and employed the same course objectives in each syllabus. These objectives were: (1) explain sociological concepts pertaining to social theory, research methods, culture and media, socialization and the construction of reality, groups and networks, social control, deviance, social stratification, race and ethnicity, and gender inequality; (2) utilize popular culture literature and media as data to critically analyze society through the use of a sociological imagination; and (3) apply sociological theories in applied contexts. Since all classes shared the same course objectives, students in every class followed the same course outline, used the same textbook, and took the same mid-term and final exam.

For the purpose of this study, students’ performances are measured by final exam scores, while students’ attitudes toward sociology are measured by responses on an attitude survey. The attitude survey is adapted from Bauer (2008) which measures students’ attitudes through twenty opposing socio-emotional indicators (such as easy-hard, confusing-clear, satisfying-frustrating, insecure-secure) on a seven point scale. In some cases the responses on the attitude survey were reverse coded in order to have positive attitudes consistently fall on the higher end of the scale. The attitude scores were then averaged into one score, which is labeled “attitude index” through the remainder of the article.

We controlled for attitudes toward the instructional methods and instructor effectiveness. These controls were added in case students’ attitudes toward sociology are collinear with

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1 We cut one indicator, “challenging/not challenging,” because both options could be viewed as the more positive attitude. Perhaps an instructor would view “challenging” as the more positive attitude; whereas a student would view “not challenging” as the more positive attitude. Due to the ambiguity of the indicator we left it out of the analysis, leaving us with nineteen socio-emotional indicators to work with.

2 A factor analysis was conducted, but factors generated through the analysis did not add substantially to the model’s explained variation when compared to the attitude index. Thus, in the interest of parsimony, we use the attitude index.
students’ attitudes toward the instructional strategy employed or the course instructor. Furthermore, we controlled for students’ self-report of learning, hours spent on out-of-class readings, and attendance, assuming that each of these variables has an effect on students’ performances.

After the data was collected independent two tail t-tests were performed to determine significant differences (p-value ≤ .05) in students’ performances and attitudes toward sociology between TBL and LBL classes. A path analysis was also conducted to detect the presence of variables that might mediate the relationship between instructional method and students’ performances.

Participants

Student participation in the study was not compulsory; instead students were given an opportunity to participate in the study by signing an informed consent form allowing their attendance record, final exam score, and attitude survey to be used in the study. In total 61 percent (74 out of 121) of students participated, of which 31 were from the LBL classes and 43 were from the TBL classes. Although the sample includes a disproportionate amount of females (53 females compared to 21 males), it is a fair representation of the students who take sociology classes at this institution. No other demographic variables were accounted for. The instructor of the classes had no knowledge of who participated in the study as informed consent and attitude surveys were collected by an independent survey facilitator. Attendance records and final exam scores were collected from course grade books several weeks after the completion of the winter quarter.

We should note that this study employs a small sample size, therefore statistical power is limited. Nevertheless, our sample size falls in-between the smallest (n=40) and largest (n=200)
sample sizes profiled in previous TBL studies (Haberyan 2007; Carmicheal 2009). Thus, although not robust, we are confident that these results accurately capture the effect of TBL on students’ performances and attitudes.

**Course Descriptions**

The LBL classes started with the instructor answering questions and providing reminders about the syllabus, content outline, and upcoming assignments. Using a PowerPoint presentation the instructor had students answer three multiple choice review questions covering content from the previous class. Then, as a class, the students and the instructor went over each question. The instructor then provided a discussion prompt pertaining to the content of the chapter that students were assigned to read prior to class. For example, on the day devoted to teaching gender, student’s completed Glick and Fiske’s (1996) “Ambivalent Sexism Inventory” followed by a class discussion of the results. Using a PowerPoint presentation as an outline for students, the instructor then covered content from the reading through a lecture format, which typically took about two hours to complete. Intermittently during the lecture the instructor would have students work in small groups to complete a task related to the content, or bring up a discussion question for the class to answer; however these class activities were not regularly scheduled. A ten minute break was given to students half way through the lecture. Additionally, students were to complete five in-class and two out-of-class writing assignments based on prompts supplied by the instructor. These writing assignments constituted 45% of the course grade. Another 45% of the course grade was based on scores for the mid-term and final exam. The last 10% of the grade was based on attendance, which was taken every class.

TBL classes started much the same way as LBL classes with the instructor answering questions about assignments and the course outline. However, after the student’s questions were
answered the structure of the TBL classes greatly diverged from the structure of LBL classes. For the first twenty minutes of class students completed an *Individual Readiness Assessment Test* (i-RAT). Practically, these were reading quizzes that included ten multiple choice as well as one extended response question based on the readings assigned for that class. The rationale behind the i-RAT is two-fold. First, it provides individual accountability for assigned readings (see TBL principle #2). Second, it provides an opportunity for the instructor to see which concepts are understood from the assigned readings and which concepts need reinforcement. Students were allowed to use hand written notes on i-RATs.

Once i-RATs were finished students moved into their teams, which were formed by the instructor using *catme.org*, an online team forming tool produced by Purdue University and supported by the National Science Foundation (Loughry, Ohland, and Moore, 2007). The website provides a platform for instructors to objectively build and evaluate teams through two student completed surveys (Catme/Team-Maker, 2012). “Team-Maker”, the first survey, forms teams using mathematical algorithms according to instructor-specified criteria such as student’s GPA, leadership preferences, and race or gender. The second survey, “CATME” (Comprehensive Assessment for Team-Member Effectiveness), gathers peer evaluations of team members in terms of team contribution, quality of work, and preparedness. For TBL classes in this study, the instructor had students complete a “Team-Maker” survey during a specified time period during the second class and, once surveys were complete, generated teams. A program like *catme.org* accommodates TBL principle #1, by helping instructors properly form and manage teams.

Once teams gathered they were given a *Team Readiness Assessment Test* (t-RAT), which is exactly identical to the i-RAT. In order to achieve timely feedback (TBL principle #4) teams
used an *Immediate Feedback Assessment Technique* (IF-AT) form, which is a response sheet that reveals answers after students have scratched off an opaque latex layer covering a response set (Sweet and Michaelson, 2012). Correct answers are revealed with a star while incorrect answers are left blank (Epstein, Epstein, Brosvic, 2001); thus teams immediately knew which questions they answered correctly. To provide team accountability (TBL principle #2) t-RATs were scored and entered into the course gradebook (see below for a breakdown of grade weights). If teams scratched off an incorrect answer on the IF-AT form they had the opportunity to answer the question again, repeating the procedure until they had scratched three incorrect answers. Per question, teams received full credit for a correct original response, half credit for a correct second response, and a quarter credit for a correct third response. Teams received no credit if they chose three incorrect responses. Since IF-AT forms only apply to multiple choice questions, teams were asked to discuss their individual answers to the extended response question from the i-RAT. As teams worked on the t-RAT the instructor graded and conducted an item analysis on the completed i-RATs. The item analysis exposed which concepts the students understood (questions that an overwhelming majority of students answered correctly) and which concepts needed reinforcement (questions that an overwhelming majority of students answered incorrectly). Teams had 30 minutes to complete the t-RATs.

Once the t-RATs and the item analysis of the i-RATS were complete, the class spent approximately 20 minutes in an *Assessment* session where they specifically covered concepts from the reading that needed reinforcement. Students were then given a 10 minute break. Once students were back from the break they entered into a time of *Correction and Appeal* where students asked the instructor questions about the content of the reading or appealed their answers on i-RATS. If students did not have questions or appeals the instructor provided further
reinforcement of concepts through a short clarifying lecture (Michaelson and Sweat, 2011) often using a PowerPoint presentation or other class activities for support (such as the “Ambivalent Sexism Inventory” described in the opening paragraph of this subsection). The last forty minutes were spent in teams completing one or two Complex Activities. These problems were typically open answer questions that fulfilled TBL principle #3 - good assignment design. The instructor would go from team to team to examine their responses and, with verbal feedback, either mandate revisions or allow the team to proceed to the next activity if more than one activity was assigned. Once teams completed all activities they were dismissed from class. If teams did not complete the Complex Activities by the end of the class they were given 20 minutes of the next class to do so.

Twice during the quarter each student was required to complete a performance report for their team members. Performance reports were completed using the “CATME” survey. The instructor then translated the students’ performance reports into a grade. Since the performance reports were confidential, results were released to students showing the average of their peer’s evaluation for their performance compared to the aggregate average of all team members. If individual students had lower performance ratings than the team average they were highly encouraged by the instructor to contribute more to the team. In this sense, performance reports had two effects: (1) It kept individual students accountable for their work within the team (TBL principle #2), and (2) it improved group cohesion as loafing students were given feedback concerning how they could improve their work on the team (TBL principle #1 and #4). Students in the TBL classes were individually accountable for performance on a mid-term and final exam (together worth 45% of the final grade) as well as an out-of-class writing assignment (worth 10%) and attendance (worth 10%). The rest of the grades in TBL classes included i-RATs (worth
15%), and Team Performance, which was a combination of t-RAT and performance report scores (worth 20%).

Results

In general, students in TBL classes reported more positive attitudes toward sociology than students in LBL classes (Table 1). This is particularly evident when examining the

Table 1
*Descriptive Statistics for Socio-emotional Indicators on Attitude Survey*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Lecture-Based (LBL) Classes</th>
<th>Team-Based (TBL) Classes</th>
<th>Std. Dev.</th>
<th>Std. Dev.</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Easy/Hard$^3$</td>
<td>31 4.00 1.29</td>
<td>42 3.86 1.37</td>
<td></td>
<td></td>
<td>1 = Easy</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>7 = Hard</td>
</tr>
<tr>
<td>Worthless/Beneficial</td>
<td>31 5.94 1.413</td>
<td>42 6.07 1.57</td>
<td></td>
<td></td>
<td>1 = Worthless</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>7 = Beneficial</td>
</tr>
<tr>
<td>Exciting/Boring$^5$</td>
<td>31 3.29 1.56</td>
<td>42 2.69 1.7</td>
<td></td>
<td></td>
<td>1 = Exciting</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>7 = Boring</td>
</tr>
<tr>
<td>Complicated/Simple</td>
<td>31 3.74 1.34</td>
<td>42 3.74 1.36</td>
<td></td>
<td></td>
<td>1 = Complicated</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>7 = Simple</td>
</tr>
<tr>
<td>Confusing/Clear</td>
<td>31 4.06 1.32</td>
<td>41 4.41 1.34</td>
<td></td>
<td></td>
<td>1 = Confusing</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>7 = Clear</td>
</tr>
<tr>
<td>Good/Bad$^5$</td>
<td>31 2.65 1.6</td>
<td>42 2.24 1.27</td>
<td></td>
<td></td>
<td>1 = Good</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>7 = Bad</td>
</tr>
<tr>
<td>Satisfying/Frustrating$^5$</td>
<td>31 3.26 1.59</td>
<td>42 2.69 1.24</td>
<td></td>
<td></td>
<td>1 = Satisfying</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>7 = Frustrating</td>
</tr>
<tr>
<td>Scary/Fun</td>
<td>31 5.23 1.43</td>
<td>41 5.41 1.48</td>
<td></td>
<td></td>
<td>1 = Scary</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>7 = Fun</td>
</tr>
<tr>
<td>Comprehensible/Incomprehensible$^5$</td>
<td>31 3.48 1.65</td>
<td>41 2.54 1.42</td>
<td></td>
<td></td>
<td>1 = Comprehensible</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>7 = Incomprehensible</td>
</tr>
</tbody>
</table>

$^3$ Items were reverse coded when establishing the attitude index.
Table 1 (Continued)

Descriptive Statistics for Socio-emotional Indicators on Attitude Survey

<table>
<thead>
<tr>
<th>Variable</th>
<th>Lecture –Based (LBL) Classes</th>
<th>Team-Based (TBL) Classes</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>Mean</td>
<td>Std. Dev.</td>
</tr>
<tr>
<td>Pleasant/Unpleasant (^5)</td>
<td>31</td>
<td>3.13</td>
<td>1.48</td>
</tr>
<tr>
<td>Interesting/Dull (^5)</td>
<td>31</td>
<td>2.45</td>
<td>1.69</td>
</tr>
<tr>
<td>Disgusting/Attractive</td>
<td>31</td>
<td>4.42</td>
<td>1.57</td>
</tr>
<tr>
<td>Comfortable/Uncomfortable (^5)</td>
<td>31</td>
<td>3.19</td>
<td>1.42</td>
</tr>
<tr>
<td>Worthwhile/Useless (^5)</td>
<td>31</td>
<td>2.26</td>
<td>1.15</td>
</tr>
<tr>
<td>Work/Play</td>
<td>31</td>
<td>3.19</td>
<td>1.45</td>
</tr>
<tr>
<td>Chaotic/Organized</td>
<td>31</td>
<td>4.74</td>
<td>1.48</td>
</tr>
<tr>
<td>Safe/Dangerous (^5)</td>
<td>31</td>
<td>3.35</td>
<td>1.54</td>
</tr>
<tr>
<td>Tense/Relaxed</td>
<td>31</td>
<td>4.39</td>
<td>1.33</td>
</tr>
<tr>
<td>Insecure/Secure</td>
<td>31</td>
<td>4.35</td>
<td>1.2</td>
</tr>
</tbody>
</table>

On average, students in TBL classes had significantly more positive aggregate attitudes toward the discipline of sociology than students in LBL classes. Consequently, we reject our first hypothesis that there is no difference in students’ attitudes toward sociology between TBL and LBL classes.
Furthermore, when considering control variables, there were three statistically significant differences between TBL and LBL classes (Table 2). Students in TBL classes liked the instructional methods better and reported a higher degree of learning than students in LBL classes (Table 2). Additionally, students in TBL classes spent significantly more time on out-of-class reading assignments (3.16 hours for TBL classes compared to 2.34 hours for LBL classes). There were no statistically significant differences in reports of the instructor’s effectiveness or rates of attendance.

In terms of students’ performances, the data revealed that students in TBL classes did average three percentage points higher on the final exam when compared to students in LBL classes (Table 2). Nonetheless, when the means were compared using t-tests the difference does not show to be statistically significant. This result is due to variance in final exam grades. The standard deviation of exam scores in LBL classes (15.94) is larger than the standard deviation of exam scores in TBL classes (11.09), which indicates that there is just too much variability between the exam scores of LBL and TBL classes to conclude that, more than 95 percent of the time, students in TBL classes will out-perform students in LBL classes. Consequently, we fail to reject our second hypothesis; that there is no difference in students’ performances between TBL and LBL classes. In other words, students in TBL classes perform just as well as students in LBL classes.

We were puzzled by the significantly different reports of student learning between the two sets of classes. If students in TBL classes reported that they learn more than students in LBL classes, we expected that they would also perform better on the final exam. Given these counter-intuitive results, we developed a path model to explore the relationship between learning method
and students’ performances. After running a fully recursive analysis, we eliminated teacher effectiveness and hours spent on out-of-class readings for their lack of effect on the model.

Table 2

Statistics for Lecture-Based Classes and Team-Based Classes

<table>
<thead>
<tr>
<th>Variable</th>
<th>Lecture-Based (LBL) Classes</th>
<th>Team-Based (TBL) Classes</th>
<th>P-value$^4$</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Final Exam</td>
<td>31 74.28 15.94</td>
<td>43 77.56 11.09</td>
<td>0.301</td>
<td>41% - 98%</td>
</tr>
<tr>
<td>Attitude Index</td>
<td>31 4.60 0.88</td>
<td>42 5.06 0.71</td>
<td>0.020</td>
<td>1 - 7</td>
</tr>
<tr>
<td>Attendance</td>
<td>30 10.15 1.48</td>
<td>43 10.31 1.04</td>
<td>0.508</td>
<td>5 - 11 Classes</td>
</tr>
<tr>
<td>Degree of Learning</td>
<td>31 5.71 1.13</td>
<td>41 6.22 0.80</td>
<td>0.028</td>
<td>1 = Learned Nothing 7 = Learned A Lot</td>
</tr>
<tr>
<td>Instructor Effectiveness</td>
<td>31 6.35 0.84</td>
<td>41 6.56 0.55</td>
<td>0.213</td>
<td>1 = Not Effective 7 = Effective</td>
</tr>
<tr>
<td>Liked Instructional methods</td>
<td>31 5.65 1.47</td>
<td>41 6.32 0.93</td>
<td>0.021</td>
<td>1 = Did Not Like 7 = Liked Very Much</td>
</tr>
<tr>
<td>Out-of-Class Reading</td>
<td>27 2.34 1.32</td>
<td>38 3.16 1.58</td>
<td>0.032</td>
<td>.5 hours - 5 hours</td>
</tr>
</tbody>
</table>

Furthermore, we eliminated the variable that measured how much students’ liked the instructional methods due to multicolinearity with the attitude index ($r=.463$). Consequently, we developed a model that revealed two results (Figure 1). Unsurprisingly, the first result is a direct relationship between attendance and students’ performances on the final exam; a student’s final

$^4$ T-test results for a comparison of means between independent samples (two-tailed).
exam score directly increased 2.5 points, on average, for every class that he or she attended. Secondly, we discovered an indirect relationship between learning method and students’ performances on the final exam as mediated through students’ attitudes and their reports of learning. On average, students in TBL classes reported better attitudes toward sociology than students in LBL classes, increasing their reports of learning, thereby positively affecting their final exam grade. Although the indirect effect on students’ performance is relatively small (b=1.324 points, β=0.52), students tended to do better on the final exam when they felt as though they had learned and students tended to feel as though they learned when they had better attitudes toward sociology. Such attitudes are more likely to occur in TBL classes than LBL classes.

![Path model illustrating direct effect of attendance and indirect effect of TBL on students' performances.](image)

**Figure 1.** Path model illustrating direct effect of attendance and indirect effect of TBL on students’ performances. “*” indicates p-value ≤ .05. “**” indicates p-value ≤ .01.

**Discussion and Conclusion**

The results of this study reflect previous research in TBL classrooms – although students’ performances in TBL classes is not statistically different than LBL classes (not including the nuanced indirect effect described above), when students take a TBL class they have more
positive attitudes toward the discipline of sociology than students who take a LBL class. The question now becomes – why? Why do TBL students display more positive attitudes toward sociology than LBL students?

One critical explanation offered by Hayberan (2007) is that TBL provides a novel approach to teaching. Students who are bored with traditional lecture-based methods might respond to the new style by engaging in the class and having better attitudes toward the subject. However, if TBL became the preferred instructional method on college campuses these results might disappear as the novelty of the instructional method wears off; causing students to disengage and attitudes toward subject matter to flatten. However, the scope of this study can neither confirm nor reject this explanation.

Alternatively, parallel with previous research, we argue that students of TBL classes have more positive attitudes toward the discipline than students of LBL classes because they are actively engaged in the learning process through team activities and discussion without much interference from the instructor. Consequently, student’s affinity toward TBL methods affected learning as students in TBL classes reported that they learned more than students in LBL classes. In fact, results from the supplementary section of the attitude survey, which was completed only by TBL students, revealed that students ranked t-RATs as the most effective instructional element of the TBL process when compared to individual reading assignments, i-RATs, and team activities. In the open response segment of the supplementary section, one student noted that working on a team was a positive experience because it provided the ability, “to discuss things among our group on the [t]-RATs [and] to distinguish why our answer we chose was the correct one.” Another student remarked, “It was good to discuss the different ways or reasons everyone came up with their answer. [I]t created a dialogue that help[ed] [me] understand the
coursework.” A third student stated, “I was able to understand why someone chose the answer they did [on the i-RAT], which in turn helped me understand the content, they ended up helping me understand by teaching me what they did to understand.” In total, 100% of students in TBL classes had positive experiences working in a team, whereas only 23% had negative experiences⁵.

Subsequently, since TBL students liked the instructional method better than LBL students they were more likely to have better attitudes toward the discipline itself. This argument is best exemplified by a student who states, “Initially I have become more apt at group work and learning other people's perspectives. I feel [teamwork] benefited my understanding of sociology as a whole.” In other instances students referenced socio-emotional indicators in relation to course material. One student remarks, “I enjoyed being able to brainstorm ideas with others and hear/give opinions in small groups where we felt more comfortable,” while another notes, “We had a fun, more relaxed, clearer way of understanding and learning the material every time.” Ultimately what these accounts indicate is that active learning through the TBL process made the class more enjoyable and the discipline more appealing.

Nevertheless, we should note that our study has limitations. First, this research did not examine student’s ability to apply concepts to contrived scenarios (e.g., Complex Activities); the element that Michaelsen and Sweet (2008) claim is the strength of the TBL process. Thus, future research is required to examine whether or not students in TBL sociology classes have a greater ability to apply content to contrived scenarios than students in classes that employ other instructional methods.

⁵ These percentages add up to 123%, which only possible because some students reported having both negative and positive experiences.
Second, it is appropriate for us to recognize the amount of time and effort that TBL requires on behalf of the instructor. As previously noted TBL instructors take responsibility for aspects of a course beyond preparing a lecture and taking attendance; they have to properly form teams, manage team cohesiveness, create innovative assignments, and provide feedback with little turn-around time. Thus some instructors may not be able to implement TBL in their classes due to time constraints and professional demands. For those who are interested in developing a TBL class, we suggest starting with one unit and, over consecutive terms, continue to develop more units until the entire introductory curriculum is formatted for TBL. Although we realize that curriculum adaptation takes additional work up-front, we believe the improvement of the public face (Zipp 2012) of sociology (as seen through more positive students’ attitudes) as well as the maintenance of student competency (as demonstrated by equivalent final exam grades between students in TBL and LBL classes) is well worth the effort.

References


