**A Study of the Effectiveness of Using Team-Based Learning in Management Classes**

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**ABSTRACT**

Working effectively as a team continues to be an important workplace skill and designing innovative pedagogies for developing this skills is a goal of management education. Building on previous research in team learning, we introduce formal team based learning (TBL) to our classrooms and measure outcomes of quality of team learning, professional development and team satisfaction. We also assess students’ perceived fairness of the work distribution and analyze its effect on these outcomes. Our findings indicate that TBL resulted in increases in the quality of team learning, professional development and team satisfaction. Only team satisfaction was significantly related to perceived fairness, with students who perceived themselves as doing more of the work dissatisfied with the team experience. Perceived fairness did not affect team learning or professional development. We discuss our contributions and provide suggestions for future research.

**Keywords:** Team Based Learning, Professional Development, Team Satisfaction, Teamwork Skills

**Introduction**

Working successfully in teams is a primary expectation in most organizations. In fact, according to the Society for Human Resource Management building a culture around productive and engaging teams is one of the top labor market trends (Benz et al., 2015/2016). Teams can take a variety of forms, for example, production, professional or managerial teams and teams are inherent in an array of industries, from technology and manufacturing to the performance arts (e.g., music, film) and sports industries. As such, possessing effective teamwork skills is an important skill for students preparing to enter the workforce. Moreover, well-functioning teams can improve employee satisfaction and work performance (Levi, 2007). However, poor teamwork skills can lead to decreases in performance and frustration among team members. Therefore, we seek to better understand the ways in which team learning can be fostered in our classes in order to better prepare our students for the workplace.

 Team-based pedagogies have long received attention in higher education (e.g., Borrego, Karlin, McNair, & Beddoesc, 2013; Favor & Kulp, 2015; Michaelsen & Sweet, 2008; Michealsen, Watson, Cragin, & Fink, 1982). Borrego and colleagues reviewed 104 studies to determine which teamwork skills were most frequently taught and which ineffective team behaviors were most commonly exhibited (Borrego et al.). Among their findings were learning objectives that focused on basic teamwork skills such as communication and collaboration. Reducing social loafing in order to assure equal team effort was a key concern of instructors and this ineffective team behavior remains a concern. For example, Favor and Kulp found that adult learners enrolled in online courses were less likely to prefer team projects because of challenges with distributing the workload equitably, a finding that was much less salient to the adult learners who attended courses on campus. This suggests that developing teamwork competencies may be more effective when team learning is face-to-face within the classroom and emphasizes the fact that training students in specific teamwork skills remains an important pedagogical focus.

Therefore, in this study we examine the effectiveness of team learning and teamwork skills development within variety of courses using a Team-Based Learning (TBL) pedagogy. Our purpose is to foster team learning and professional skills by increasing students’ understanding of team processes and building skills in collaboration while still delivering course theory and concepts. We aim to contribute to the team based learning research by examining students’ learning experiences, professional development, and satisfaction from working in a team and to develop a measure to assess these attributes. We also investigate students’ perceptions of fairness and its effects on team learning, professional development and satisfaction. By designing courses with team based learning at their core, we seek to better prepare students for the demands of teamwork in the workplace.

To accomplish our goals, we first provide an overview of team-based learning, outline our learning objectives and team-based learning approach, and provide a brief description of the team-based activities we use in the classrooms. We then present the learning outcomes and measures followed by the results of our student perception survey of team-based learning. Our discussion includes an analysis of our findings and suggestions for extending this research.

**Overview of Team-Based Learning**

 Designing curriculum as well as class activities to emphasize the learning and assessment of teamwork skills and collaboration is at the core of many management courses (e.g., Goltz, Hietapelto, Reinsch, & Tyrell, 2008; Kemeny & Stickney, 2014). Moreover, the Association to Advance Collegiate Schools of Business (AACSB) specifically addresses learning collaboratively in two of its accreditation standards: Standard 13 requires faculty to provide opportunities for students to collaborate and develop cooperative work skills, and Standard 14 expects students to contribute to the learning of others by actively participating in group learning experiences (AACSB, 2012). Furthermore, as noted previously, working in a team environment is more and more commonplace in organizations and employers are expecting applicants to have basic teamwork skills. As such, there is clear motivation and interest to continue developing pedagogies that emphasize the development of teamwork competencies and learning in teams.

Going beyond team activities as independent learning experiences in the classroom, TBL is a systematic teaching strategy where team activities are designed in a particular sequence with the goal of developing small groups into teams (Fink, 2013; Michealsen, Knight, & Fink, 2004). Thus, TBL is a structured, small-group learning method that has been associated with a variety of positive student outcomes, including increased attendance, improved student preparation for learning, increased achievement, and development of student collaboration skills (Michaelsen & Sweet, 2008b). With TBL, students and instructors adopt a learning paradigm as opposed to a more traditional instructional paradigm. This allows for variation in students’ learning and keeps professors “fresh” in their classrooms.

TBL can be introduced into a variety of classes. Because TBL is a unique student-centered instructional strategy, it emphasizes learning to apply concepts rather than merely learning about them (Lane, 2008). Through TBL initiatives, students behave less like “empty vessels” and more like colleagues (Lane, p. 57). When instructors use TBL in the classroom, the vast majority of class time is used for team assignments that focus on using course content to solve the kinds of problems that students are likely to face in the future (Michaelson & Sweet, 2008b). A key design issue for creating effective tasks is how to best focus student knowledge, observation, and analysis toward a concrete action that makes thinking visible. Activities that require actions in the shape of clear decisions applied to complex scenarios, within a restricted framework of options, are most likely to channel student thinking toward higher-level goals (Roberson & Franchini, 2014).

Studies have also shown that students find TBL motivating, interesting, enjoyable, and fun (Haberyan, 2007). Similarly, research has shown that students learn most when they are more engaged in the experience rather than as passive participants (Kuh, 2008). According to Kuh high-impact activities such as collaborative assignments and projects, which foster deep learning, general gains, personal gains and/or practical gains increase student engagement. Furthermore, the incorporation of collaborative assignments and projects, which is the foundation of team-based learning is included in his study of ten high-impact educational practices for undergraduate college students’ success.

In addition, many professors are using the “flipped” classroom techniques that are characteristic of TBL, where class time is devoted to team activities that require pre-class preparation. Wallace, Walker and Braesby & Sweet (2014) found that TBL initiatives can optimize and reward students’ pre-class efforts. More importantly, TBL and the flipped classroom share a commitment to strategically designed learning opportunities to optimize the role of instructor toward guiding the student to deeper learning (Wallace et al.). Using this method, instructors become better equipped to (1) assess and enhance student content acquisition from pre-class study, and (2) use the majority of class time for activities that enable them to discuss, take-risks, and make mistakes while developing their expertise. Therefore, in this paper we share our TBL teaching strategy used to help students build multiple skills in teamwork. Next we outline our learning objectives and describe the team learning approach of sequencing learning activities.

**Current Study**

**Learning Objectives and Team Based Learning Description**

In addition to mastering course specific content, the team based learning objectives for our courses are 1) to help students understand team process and 2) to build their collaboration and professional skills. We apply team learning as originally defined by Michaelsen, et al. (1982). That is, we provide a classroom experience that allows students “extensive use of problems, simulations, and experiential exercises to provide students with the opportunity to develop the ability to apply course concepts” (Michaelson et al, p. 14).

To accomplish this goal we first researched, developed, and introduced a brief team learning training that was disseminated in all courses involved in our study. While our research began in the fall of 2015, the courses that are included in this study spanned from the spring of 2016 through the spring of 2017 (three semesters). The courses included in this research were: Introduction to Business, Ethics and Social Responsibility, Sustainable Business Practices, Organizational Behavior, Sports Psychology, and Human Resource Management. All instructors were well versed and trained in TBL techniques. Following Michaelson & Sweet’s (2008) readiness assurance model, we chose a class at the beginning of the semester to administer a short, five question quiz on one of the early reading assignments in the class. On this day, when students arrived in class, they were given a short five questions multiple choice quiz on the selected reading to complete individually.

After taking the quiz individually, students then formed small groups and completed the quiz together. Students tallied their distance scores for both their individual quiz score and their group quiz score. Students were asked to compare the scores and think of possible reason why their group scores were either the same, greater, or less than their individual scores. As expected, most groups had better group scores than their individual scores. Following this activity, we led a discussion about teams and team learning with a follow up handout summarizing our key points about working in teams. This set the tone for the variety of team based learning activities that were completed throughout the semester. These in-class activities varied across classes and comprised between 20 and 35 percent of students’ course grades. Each TBL event begins with an individual readiness assurance test followed by a group quiz similar to our warm up activity. Later in the semester, some of the same questions from their in-class quiz were on students’ exams.

At this point, following Michaelson and Sweet (2008b), we formed permanent teams of 3 to 7 students. Throughout the semester, team-based learning activities were completed in these teams. Each team-based learning activity included the three basic components of TBL – an individual readiness assurance test, a group readiness assurance test and an application activity surrounding the key concepts of the chapter or course topic. All TBL activities also included the four S’s of team based learning as outlined in Michaelson and Sweet (2008b). That is, they addressed a Significant problem, students were required to make a Specific choice, all teams worked on the Same problem and there was embedded in each activity a Simultaneous reporting from each team. Examples of application exercises included short case study problems, group activities with simultaneous reporting and peer review (e.g., poster board presentations), and group competitions requiring viewing of a short video and applying theoretical models to the content.

**Learning Outcomes and Measures**

In order to assess our two general learning objectives (understanding team processes and building collaboration skills), we designed a student survey that addressed students’ perceptions of the team-based learning experiences. Specifically, to assess the extent to which the various team activities helped students understand the team process, we focused on questions that tapped into student’s satisfaction with their group/team work and how much students’ learned from their group/team work. We also assessed collaboration through students’ satisfaction on team learning based on their perceived contribution to the group project.

Based on previous survey findings surrounding team learning (Parent, Lovelace, Hardway, and Seitchik, 2016) measures were added to the survey to assess professional development and quality of team learning of students. Two previous studies of team based learning in the health sciences education field measured students professional development and quality of team learning in the context of teamwork perceptions (Gallegos & Peeters, 2011) and in the context of attitudes of TBL perceptions (Parmelee, DeStephen, & Borges, 2009). Thus, four items measuring professional development and three items measuring team impact on quality of learning using TBL were incorporated into the survey.

The above combination gave us a 19-item survey that we administered at the end of the semester using a 7-point Likert scale with anchors of “Strongly Disagree” and “Strongly Agree”. Some examples of items were: “I have found that working with a team helps me develop skills in working with others”, “In general, I like group work in my classes”, “I learned more in this class because of my group work”, and “I have found being part of a tem improves my course grades.” To gain an understanding of fairness of work, we had students estimate the contribution of each member of their group including themselves to their TBL activities through percentages. Two open ended questions were included in the survey that asked students to indicate their favorite part of the team based learning activities and their least favorite part of their team based learning activities. Surveys were administered near the end of the semester when all TBL activities were complete. In total, 211 surveys were collected from college students.

**Results**

**Factor Analysis of Teamwork Variables**

Because the scale designed to measure student perceptions of their teamwork experiences was newly developed mixed with some already established subscales, we first performed a factor analysis to determine the underlying constructs measured by the individual items. We performed a factor analysis of the 19 items, because it is a useful way to ascertain whether groups of single items on a scale measure underlying constructs and thus warrant the reduction of several questions into a smaller number of factors (Hair, Anderson, Tatham, & Black, 1998). Because one of these questions, “Our group had big problems caused by one or more ‘freeloaders,’” was worded negatively, it was reverse coded prior to entering all the 19 items into the factor analysis. Preliminary analyses indicated that a three factor solution would best account for the relationship between the data, and a Principal Components Analysis was performed, fixing the number of factors for extraction to three with a Varimax rotation. The rotated component three factor matrix can be seen in Table 1. As can be seen in the table, the first factor included 10 items and represented a measure of quality of team learning (Cronbach’s alpha = .93). A second factor consisting of five items and represented a measure of professional development from working in teams (Cronbach’s alpha = .84). Finally, the third factor consisted of four items and represented a measure of team satisfaction or enjoyment (Cronbach’s alpha = .82).

Insert Table 1 about here

**Correlations between factors**

To determine whether the factors were related to one another, we ran correlations between the factors. As shown in Table 2, all factors were positively correlated with one another. These results suggest that participants who enjoyed working in a group (i.e., the factor of Team Satisfaction) also reported that they learned more (i.e., the factor of Quality of Team Learning) and enhanced their professional development more. The same was true for all factors; as one went up for a participant, so did the others.

Insert Table 2 about here

**Perceived Fairness of Work Divided**

Participants reported, in percentages, the extent to which themselves and their group members contributed to the project. We were interested in whether participants perceived this divide in work to be fair, and, more importantly, whether this fairness differed according to the different factors (Quality of Team Learning, Professional Development, and Team Satisfaction). We coded fairness as 0 (unfair: work was not divided evenly amongst members) or 1 (fair: work divided evenly amongst members) for all participants. We then ran a one-way analysis of variance (ANOVA) with fairness as the independent variable and the three factors as the dependent variables. The means and standard deviations are reported in Table 3. We found an effect of fairness for Team Satisfaction, such that participants reported that they were satisfied with their team experience significantly more when they reported a fair divide in workload compared to when they reported an unfair divide in workload, *F* (1, 209) = 15.80, *p* < .001. We did not find effects for the Quality of Team Learning factor, *F* (1, 209) = 1.54, *p* =.215, or Professional Development factor *F* (1, 209) = .08, *p* = .776.

Insert Table 3 about here

In the above analysis, all unequal perceived contribution percentages were coded together into one group. However, there are different levels of “unfairness.” For instance, a participant could report unfairness by perceiving only him/herself as completing majority of the work (e.g., “I perceived myself as completing 40% of the work, person A as completing 20%, person B as completing 20%, and person C as completing 20%”, “I perceived myself as completing 40% of the work, person A as completing 40%, person B as completing 10%, and person C as completing 10%”), or a participant could report unfairness by perceiving him/herself as being the slacker (e.g., “I perceived myself as completing 10% of the work, person A as completing 30%, person B as completing 30%, and person C as completing 30%”, “I perceived myself as completing 10% of the work, person A as completing 10%, person B as completing 40%, and person C as completing 40%”). To explore these variations in unfairness perceptions, we divided unfairness into two categories: 1) “I perceived the unfairness to be such that I was more productive than my teammates” and 2) “I perceived the unfairness to be such that I was less productive than my teammates.” Group 1 (more productive) included those who perceived themselves to NOT complete less work than anyone else (i.e., there were always others in the team that did less than the participant). Group 2 (less productive) included those who perceived themselves to be a slacker where no one did less work than them. An ANOVA was conducted with unfairness condition (0 = fair, 1 = more productive, 2 = less productive) as the independent variable and the three factors of the scale as the dependent variables. Results showed an effect of unfairness for Team Satisfaction, *F* (1, 208) = 12.07, *p* < .001 (see Table 4). We did not find effects for the Quality of Team Learning factor, *F* (1, 208) = 1.24, *p* =.291, or Professional Development factor *F* (1, 208) = .33, *p* = .720. Post-hoc tests (Tukey HSD) revealed that those who perceived themselves to be more productive reported being significantly less satisfied with their team than those who perceived themselves as being less productive or as divided fairly, *p*s < .05.

Insert Table 4 about here

**Qualitative data**

Participants were also asked two open-ended questions about their most and least favorite aspects of TBL. One of the authors reviewed all open-ended answers and developed a coding scheme for favorite and least favorite aspects. The themes for most favorite aspects of TBL included: (1) Idea generation/Ability to gain different perspectives (e.g., “Bouncing ideas off of each other”, “Seeing different vantage points”), (2) Meeting/working with others (e.g., Having support for our work”, “Working with different people”), (3) Learning more (e.g., “Learning from my team members”, “enhance my learning experience”), (4) More creative classes (e.g., “Creative projects in class posters were fun”, “Made class interactive and enjoyable”), and (5) Other (e.g., “Was doing the poster things”, “I liked the idea of scratch off”). For least favorite aspects of TBL, themes included: (1) Time constraints/workload (e.g., “Time management”, “Not completing things on time”), (2) Specifics of TBL projects (e.g., “Probably the ones where we had to write papers. I’d rather do posters and learn from other groups”, “The multiple choice”), (3) Grading issues (e.g., “Peers grading our work”, “Having the others grade them”), (4) Working with others (e.g., “Slackers”, “Sometimes being in a group people aren’t prepared and it affects you”), (5) Positive reviews (e.g., “Nothing. It was fun/helpful. I usually prefer to work on my own but I enjoyed TBL”, “Nothing. I truly enjoyed Team Based Learning. I wish we did this in every class”, and (6) Other (e.g., “Out of class projects and presentations”, “Being separated from friend”). Upon developing these themes, two additional authors coded roughly 25% of responses to establish interrater reliability. The raters were very reliable (αfavorable = .84 and αleast favorable = .80) and, thus, one rater coded the remaining responses.

Table 5 includes frequencies for all themes. The most common responses for most favorable aspect of TBL were Meeting/working with others (33.8%) and Idea generation/Ability to gain different perspectives (30.3%). The most common response for least favorable aspect of TBL was Problem working with others (34.4%). If a response included two themes, it was coded separately. For example, the response “I liked meeting new people. I also liked how we learned from each other” was coded first as Meeting/working with others and then as Learning more. However, so few people (5.9% for favorable and 1.6% for least favorable) warranted two responses that we only examined their first response.

The most and least favorable aspects of TBL did not correlate with any of the three factors, *p*s > .10. An ANOVA also revealed no effect of perceived fairness on the most and least favorable aspects of TBL, *p*s > .60.

Insert Table 5 about here

**Discussion**

From our survey, three main factors emerged. The first factor represents a measure of quality of team learning, the second factor represents professional development from working in teams, and the third factor represents team satisfaction or enjoyment. Further, our results indicate that in general students in our classes had high levels of all three of these factors. All three factors had means above 5 (toward the strongly agree anchor of 7). That is, students’ experience with their team activities indicate a high quality of team learning (M = 5.41, SD = 1.08), professional development from working in teams (M = 5.63, SD = .93), and satisfaction with their team experiences (M = 5.73, SD = 1.25). The identification of useful measures of teamwork is a positive contribution to the field, especially as we move toward a model of developing professional skills for our students.

Whether students perceived the work distribution as fair or unfair made no difference on their professional development or their quality of team learning. However, students who perceived the workload as unfair were less satisfied with their team experiences that students who perceived a fair distribution of work. As with many team situations, there will always be issues with equal distribution of work. This is true for both classroom and professional settings. The fact that students continue to learn and develop in their teams is good news for both educators and practitioners alike. Educators can be comfortable continuing their efforts surrounding team-based learning and teamwork in general. Practitioners can understand that even members who demonstrate lower team satisfaction with their workplace teams can learn and develop. Our findings support continued efforts to teach our students how to work successfully in teams.

When we further delineated students who perceived their workload in teams to be unfair into two different categories (I did more work and unfair versus others did more work and unfair) similar results were found. Both groups experienced similar results surrounding professional development and team learning (no statistically significance between groups). What is interesting about this delineation of our sample is that there was a significant difference in team satisfaction between these two groups. The students who perceived that they did more work in their groups were less satisfied with their teams than the students who perceived they did less work in their groups. Research suggests that participants socially loaf (i.e., do less work when in groups than when alone) when their output cannot be identified with themselves (e.g., Williams, Harkins, & Latané, 1981). If students can receive neither credit nor penalty, then they will not put out the effort. However, it is the case in the current groups that students’ efforts were highly identifiable, thus members could identify accurately effort or lack of effort in their teams. The differences suggest that when students reported unfairness in the work divided, it was because they could identify the effort put out by all individual team members accurately and those that self- identified as “freeloaders” were more satisfied with their team experiences.

An important aspect of team based learning is the use of a peer review system throughout team learning activities (Michaelson & Sweet, 2008b). This process is something to be considered in subsequent class design. While roughly only one third of our students reported an unfair work distribution after having worked with their groups throughout the semester, adopting a peer review process may decrease those numbers (given the “freeloaders” might change their behaviors when called out). It follows that students would have a more positive view of their team experiences. Additionally, many employers use 360 degree and/or peer review processes. Peer review would prepare our students for another important aspect of their future workplaces.

Given the increasing emphasis on both assessment and assurance of learning in our business curriculums, the measures developed in this study can be examined for viability in a university’s assessment process. Our measures might complement the work of Kemery and Stickney (2014) and add to their multifaceted approach to assessing teamwork. Their measures included teamwork knowledge and peer and self-appraisals. Our measures of quality of team learning, professional development from working in teams, and team satisfaction and enjoyment could add other dimensions to their analysis of student achievement. Future studies might incorporate these measures. Future studies should also follow up with students after graduation in their professional careers. It would be very informative to track team learning on a long term basis. Additionally, we suggest further research into more details of what students and employers alike believe to be skills that can take from classroom learning into their workplaces. Finally, team learning was only assessed through self-report. In the future, we will try to assess actual learning in teams to see if TBL does in fact increase learning.

The findings in this study are good news for advocates of teamwork, collaboration, and team learning. When given a variety of team activities in their classes, the majority of students gain something from the experience. As our students graduate and move into collaborative work places, it is important for faculty to continue to develop curriculum that fits these needs. As mentioned earlier, collaborative assignments and projects are thought to have great impact upon students during their college years (Kuh, 2008). Additionally, AACSB standards require faculty to provide opportunities for students to collaborate and develop cooperative work skills, and expects students to contribute to the learning of others by actively participating in group learning experiences (AACSB, 2012). The study helps management educators better understand, implement, and measure team learning experiences in their classes.

**References**

AACSB. (2012). *Eligibility procedures and accreditation standards for business accreditation*. Retrieved from <http://www.aacsb.edu/accreditation/standards/>

Benz, J., Boudreau, J., Buckingham, M., Cappelli, P., DeCamp, P., Galinsky, E., Harris, J., Layney, T., MacDonald C., and Monaghan, D.. (2015/2016). Ten thought leaders map out everything you need to know in 2016. *HR Magazine,* 60(10): 28-44.

Borrego, M. Karlin,J., McNair,L. and Beddoesc, K. (2013). Team Effectiveness Theory from Industrial and Organizational Psychology Applied to Engineering Student Project Teams: A Research Review. *Journal of Engineering Education*, 102(4): 472–512

Davidson, N., Major, C. H., & Michaelsen, L. K. (2014). Small-group learning in higher education—cooperative, collaborative, problem-based, and team-based learning: An introduction by the guest editors. *Journal on Excellence in College Teaching, 25*(3&4), 1-6.

Favor, J. and Kulp, A. (2015) Academic Learning Teams in Accelerated Adult Programs: Online and On-Campus Students’ Perceptions. *Adult Learning*, 26: 151-159.

Fink, L.D. (2013). *Creating significant learning experiences, revised and updated: An integrated approach to designing college courses.* San Francisco, CA: Jossey Bass.

Gallegos, P. J., & Peeters, J. M., (2011). A measure of teamwork perceptions for team-based learning, *Currents in Pharmacy Teaching & Learning*, 3, 30-35.

Gottschall, H., & Garcia-Bayonas, M. (2008). Student attitudes toward group work among undergraduates in business administration, education, and mathematics. *Educational Research Quarterly*, 32, 3-28.

Haidet, P., Kubitz, K., & McCormack, W. T. (2014) Analysis of the team based learning literature: TBL comes of age. *Journal on Excellence in College Teaching*, 25(3&4), 303-333.

Hair, J. F., Anderson, R. E., Tatham, R. L., & Black, W. C. (1998). *Multivariate Data Analysis.* Upper Saddle River, NJ: Prentice Hall.

Kemery, E. R. & Stickney, L. T. (2014) A Multifaceted Approach to Teamwork Assessment in an Undergraduate Business Program. *Journal of Management Education*, 38(3) 462-469.

Koles, P.G., Stolfi, A., Borges, N.J., Nelson, S., & Parmalee, D. X. (2010) The impact of team- based learning on medical students’ academic performance. *Academic Medicine*, 85(11), 1739-1745.

Kuh, G. D. (2008). *High-impact educational practices: What they are, who has access to them, and why they matter*. Washington, DC: Association of American Colleges and Universities

Lane, D. (2008) Teaching skills for facilitating team-based learning. *New Directions for Teaching and Learning*, 116: 55-68.

Levi, D. (2007). *Group Dynamics for Teams* (2nd ed.). Thousand Oaks, CA: Sage Publications.

Michaelsen, L. K., Knight, A. B., & Fink, L. D. (2004) *Team-based Learning: A Transformative Use of Small Groups for Large and Small Classes*. Sterling, VA: Stylus.

Michaelsen, L. & Sweet, M. (2008a). Team-based learning. *Thriving in Academe, 25*(6), 5-8.

Michaelsen, L. & Sweet, M. (2008b). The Essential Elements of Team-Based Learning. *New Directions in Teaching and Learning*, 116:7-27.

Michaelsen, L. K., Watson, W., Cragin, J. P., & Fink, L. D. (1982) Team Learning: A potential solution to the problems of large classes. *The Organizational Behavior Teaching Journal*, 7(1), 13-22.

Parmelee, D. X., DeStephen, D., & Borges, N. J. (2009) Medical Students’ Attitudes about Team-Based learning in Pre-Clinical Curriculum. *Medical Education Online*, 14(1), 1-7

Roberson, B., & Franchini, B. (2014). Effective task design for the TBL classroom. *Journal on Excellence in College Teaching, 25*(3&4), 275-302.

Wallace, M.L., Walker, J. D., Braseby, A. M., & Sweet, M. S. (2014) Using TBL within the flipped classroom, *Journal on Excellence in College Teaching****,*** 25(3&4), 253-273.

Williams, K., Harkins, S. G., & Latane, B. (1981). Identifiability as a deterrent to social loafing: Two cheering experiments. *Journal of Personality and Social Psychology, 40,* 303-311.

Table 1

*Rotated components with a factor load matrix for the three components.*

|  |  |  |  |
| --- | --- | --- | --- |
| Questionnaire Item | Factor 1(Quality of Team Learning) | Factor 2(Professional Development) | Factor 3(Team satisfaction) |
| In general, I like having group work in my classes.  | .477 |   |   |
| I have found that working with a team helps me develop skills in working with others. | .494 |  |  |
| I learned a lot from the work done by other members of my group.   | .661 |   |   |
| I learned more in this class because of my group work.   | .720 |   |   |
| More classes should have team based learning opportunities. | .732 |   |   |
| The group work in this class was better than in other classes.  | .473 |  |  |
| I have found that working with a team has enhanced my sense of who I am. | .543 |  |  |
| I have found that teams help me learn course material more than if I just studied alone. | .815 |  |  |
| I have learned more in courses where I have been a member of a team. | .811 |  |  |
| I have found being a part of a team improved my course grades. | .731 |  |  |
| I learned a lot from other groups’ presentations. |  | .562 |  |
| I learned a lot about the topics from the group projects.  |  | .593 |  |
| I worked hard on this project.  |  | .804 |  |
| I have found that working with a team has helped me develop cooperative leadership skills. |  | .623 |  |
| I have found that working with a team has helped me develop more respect for the opinion of others. |  | .563 |  |
| Our group had big problems caused by one or more “freeloaders”. a |  |  | .795 |
| My group members became a cohesive team through working on this project.  |  |  |  .700 |
| I enjoyed working with my teammates. |  |  |  .749 |
| I enjoyed working with my in-class groups. |  |  |  .693 |

*Notes:*a This item was reversed scored before all analyses.

Table 2

*Correlations between factors.*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Factor | 1 | 2 | 3 | Mean (SD) |
| 1. Quality of Team Learning (⍺ = .93) | ------- |   |   | 5.41 (1.08) |
| 2. Professional Development (⍺ = .84) | .800\*\* | ------- |   | 5.63 (.93) |
| 3. Team satisfaction (⍺ = .82) | .664\*\* | .597\*\* | ------- | 5.73 (1.25) |

*Notes:* \*\* *p* < .001, n = 211

Table 3

*Descriptive statistics for all factors.*

|  |  |  |
| --- | --- | --- |
| Factor | Reported Fairness in Work Divideda | Reported Unfairness in Work Dividedb |
| Quality of Team Learning | 5.47 (1.11) | 5.28 (.98) |
| Professional Development | 5.64 (.98) | 5.60 (.79) |
| Team satisfaction | 5.95 (1.15) | 5.23 (1.34) |

*Notes:* Standard deviations are in parentheses.   a n = 146 b n = 65

Table 4

*Descriptive statistics for all factors when divided by unfairness rating.*

|  |  |  |  |
| --- | --- | --- | --- |
| Factor | Reported Fairnessa | Reported Unfairness: More Productiveb | Reported Unfairness: Less Productivec |
| Quality of Team Learning | 5.48 (1.11) | 5.20 (1.07) | 5.43 (.61) |
| Professional Development | 5.65 (.98) | 5.64 (.87) | 5.45 (.47) |
| Team satisfaction | 5.95 (1.14) | 4.99 (1.41) | 5.89 (.81) |

*Notes:* Standard deviations are in parentheses.   a n = 147 b n = 48 c n = 16

Table 5

*Frequencies for qualitative data.*

|  |  |  |
| --- | --- | --- |
| Theme | Frequency (n)a | Percent of n who gave response (%)b |
|  | Most favorable |
| Idea generation/Ability to gain different perspectives | 61 | 30.3 |
| Meeting/working with others | 68 | 33.8 |
| Learning more | 25 | 12.4 |
| More creative classes | 13 |   6.5 |
| Other  | 34 | 16.9 |
|  | Least favorable |
| Time constraints/workload | 26 | 14.2 |
| Specifics of TBL projects | 34 | 18.6 |
| Grading issues | 22 | 12.0 |
| Working with others | 63 | 34.4 |
| Positive reviews | 23 | 12.6 |
| Other  | 15 |    8.2 |

*Notes:* a n = 201 b n = 183