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Assessing Perceptions of Group Work Using Team-Based Learning

Lauren Ferry, Phillip J. Wong, and Kathryn Hogan

Abstract

Group work is frequently incorporated into courses; however, student perceptions of their experiences and the benefits of group work might differ based on the structure of course. In this study, we examined student perceptions of group work in a team-based learning (TBL) course. Undergraduate students completed pre- and post-surveys on their team work experiences over a semester. Students had lower agreement with the statement “working in groups usually ends up with one person doing all of the work” and higher agreement with “working in a group makes me feel as though I am part of a learning community” at post-test. On an open-ended question comparing their group work experiences in the TBL setting to previous group work experiences, students had positive reactions, indicating that their teammates were prepared, accountable, and worked well together. While our small sample size leaves room to examine individuals’ different experiences with group work more closely, as a whole, TBL appears to provide a structure for group work that ensures individual accountability prior to team work and to provide a space for students to practice transferable skills valued by employers.

Keywords: group work, team work, team-based learning, student perceptions

Group work often plays a prominent role in higher education, and for good reason. Group work can foster communication skills, enable new and diverse perspectives, provide social support, and facilitate learning (Beebe & Masterson, 2003; Davis & Murrell, 1993; Felder & Brent, 2001; MacGregor et al., 2000). Beyond advantages of group work that can be seen in the classroom, participating in group work can develop skills that make students marketable when searching for jobs after graduation (Beebe & Masterson, 2003; Chapman & Van Auken, 2001). In fact, employers and job seekers alike emphasize the importance of communication skills, teamwork skills, and responsibility management (Hart Research Associates, 2018; Landrum & Harrold, 2003; Robles, 2012; Velasco, 2012).

Student Perceptions of Group Work

Students generally have positive attitudes toward group work (Burdett, 2003; Chapman & Van Auken, 2001; Hassanien, 2007; Payne et al., 2006; Walker, 2001). For example, students believe that group work fosters a positive attitude toward learning, develops their communication and interpersonal skills, improves the learning process as group members engage each other in productive discussions, and allows them to meet new people and build friendships (Betta, 2016; Burdett, 2003; Chang & Brickman, 2018; Chapman & Van Auken 2001; Feingold, 2008; Frame et al., 2015; Johnson & Johnson, 2009). Students also appreciate diverse groups (Frame et al., 2015; Hassanien, 2007).

Students also recognize that there may be drawbacks, such as the perceived unfairness of a common grade for each group member regardless of the amount of effort put forth by each person (Payne et al., 2006). Additionally, it may be difficult to organize a time and place for everyone to meet, and lack of support or guidance from the instructor may make for less than ideal group work experiences for students (Burdett, 2003; Hassanien, 2007; Payne et al., 2006).

One of the more prominent problems when it comes to group work is social loafing (Burdett, 2003; Burdett & Hastie, 2009; Freeman & Greenacre, 2011; Hassanien, 2007). Social loafing is the practice of individuals exerting less effort on a task in a large group, compared to when working independently (Latané et al., 1979). Social loafing can result in some team members taking on more responsibility in completing a task and other members of the group also participating in social loafing (Jassawalla et al., 2009). Students also report that the loafer's behavior is distracting and disruptive during group activities (Jassawalla et al., 2009). Group work literature is filled with techniques to reduce social loafing, includ-

ing holding group members accountable through self, peer, or instructor evaluations, creating small groups, requiring group-devised contracts with clear expectations, and increasing individual member identifiability and accountability (Aggarwal & O'Brien, 2008; Bailey et al., 2005; Brooks & Ammons, 2003; Harkins & Szymanski, 1989; Karau & Hart, 1998; Szymanski & Harkins, 1987; Williams et al., 1981). Team-based learning incorporates many of these techniques.

Team-Based Learning

Team-based learning (TBL) is a teaching method in which students learn the primary course content outside of class and work in permanent teams during class to apply course content (Michaelsen et al., 2004). TBL's deliberate structure may alleviate concerns that students generally have with group work, particularly given that students have positive attitudes when group work is structured and well-defined (Abdelkhalik et al., 2010; Butt, 2018; Vasan et al., 2009; Willis et al., 2002). Many of TBL's components—outlined below—align with recommendations for creating positive group work experiences (Oakley et al., 2004; Shimazoe & Aldrich, 2010).

Team Assignments

First, the instructor assigns students to permanent teams of five to seven students for the semester. Instructor-assigned groups are preferred to student-chosen groups because instructor-assigned groups are more likely to include students with various academic abilities and experiences and students from underrepresented groups, while they are less likely to include members who have pre-existing friendships (Deibel, 2005; Hodges, 2018; Oakley et al., 2004; Shimazoe & Aldrich, 2010; although see Chapman et al., 2006). There is debate about whether teams should be permanent (e.g., Delucchi, 2006; Michaelsen et al., 2014) or should change (Tanner et al., 2003; Johnson & Johnson, 2009) throughout the course of the semester. TBL promotes permanent teams because, although it takes some time, students who are in permanent teams become familiar with each other, become more effective communicators, are able to reach decisions more efficiently, promote shared experiences and knowledge among group members, and are more flexible as they work together (Huckman & Staats, 2013; Watson et al., 1991). Indeed, TBL promotes the transition from a collection of individuals working as a group to a cohesive team.

Quizzes

Second, students are held accountable for being prepared when coming to class through the use of individual and team quizzes. Generally, the structure of

TBL encourages students to be self-motivated, as their grades on the individual quizzes are dependent on their preparedness at the beginning of each class (Inuwa, 2012; Reinig et al., 2011). Because the class structure incorporates a Readiness Assurance Process to ensure individual students' accountability, pressure is removed from team members to hold each other accountable (Feingold, 2008; Frame et al., 2015; Willis et al., 2002). The team quizzes—which are identical to the individual quizzes—require students within a team to come to a consensus on their answers prior to recording them. They record their answers on an Immediate Feedback Assessment Technique (IF-AT) sheet, which enables them to scratch off their answer choice and receive immediate feedback as to whether they picked the correct or incorrect choice.

The team quizzes provide an understanding of which concepts are clear and which may need corrective feedback from the instructor. Team quizzes also hold individuals accountable to their teams. The format and length of these quizzes can vary depending on the content of the course. For example, in statistics courses, short (three to five questions) quizzes may be presented at the beginning of each class period to ensure students grasp all of the material. In other courses, quizzes may be presented at the beginning of each unit, with only five to seven quizzes in the entire semester (Michaelsen et al., 2004). Students complete individual and team quizzes at the beginning of class meetings. Following the quizzes, students receive “muddiest points” lectures, which clarify any information that is still unclear (or muddy). The individual and team quizzes, along with the muddiest points lectures, are essential to ensure students are prepared to complete the next component of TBL: application exercises.

Application

Students complete application exercises that require them to come to a consensus on problems requiring an application of course concepts. The activities must be challenging enough to require all members of the team to contribute. Further, to contribute to the application exercises, students must have prepared individually, which is inherent in the structure of TBL. Students must communicate effectively within their teams and with other teams in the class to be able to make their arguments for the specific decisions they make. The structure of TBL naturally allows for students' perceived benefits of group work, such as improving communication skills and having engaging discussions. The process of individual quizzes, muddiest points lectures, and application exercises can be repeated in each class period, structured to be completed in one week, or

spread across multiple weeks in the semester, depending on the course content and structure.

Peer Evaluations

Finally, peer evaluations contribute to students' final grades. Peer evaluations provide another point of accountability of students to their teammates (Stein et al., 2016). Similar to their perceptions of group work, students have both positive and negative perceptions of peer evaluations. Students believe peer evaluations improve their learning, possibly through consciously evaluating their own performance (Brindley & Scofield, 1998; Dochy et al., 1999) and appreciate that they can impact their peers' grades (Chen & Lou, 2004); however, they also recognize that peer evaluations may put a strain on relationships and result in competition among members of the group (Brindley & Scofield, 1998). Formative and summative evaluations promote positive student experiences of working in teams, including decreased social loafing (Chen & Lou, 2004; Harkins & Szymanski, 1989), particularly when the purpose of the evaluation is transparent (Chen & Lou, 2004). Having students rate their peers using quantitative and qualitative evaluations requires students to really reflect on their peers' contributions (Cestone et al., 2008) and can provide qualitative feedback to their peers to facilitate improvement.

Purpose

In sum, past research on group work in education has suggested numerous benefits to team-based learning, including improved communication skills, exposure to diverse perspectives, and increased social support throughout the learning process (Beebe & Masterson, 2003; Davis & Murrell, 1993; Felder & Brent, 2001; MacGregor et al., 2000). Despite these advantages, group work also involves some drawbacks, namely social loafing (Jassawalla et al., 2009). Team-based learning may be a solution to improve students' experiences with group work by emphasizing student accountability and communication skills. In this study, we were interested in whether students' perceptions of group work would change after participating in a TBL class, given the structure that TBL provides. We expected that students would have more positive perceptions about group work after participating in a TBL course.

Method **IRB**

A faculty mentor received IRB approval before collecting pre- and post-test data to compile a dataset. We used this dataset in our study, coding the relevant qualitative data and analyzing the relevant quantitative and qualitative data.

Participants

Sixty-eight participants (54 female; 14 male) were enrolled in an upper level developmental psychology class at a medium-sized state university. Participants were primarily juniors and seniors, as well as a few sophomores ($M_{age}=21.2$; $SD_{age}=2.89$). Participants received course credit for completing the pre-test and post-test.

Materials and Procedure

During the first week of the semester, participants answered 12 closed-ended questions and two open-ended questions regarding their perceptions of group work. On the first day of class, students were assigned to teams and remained in these teams for the duration of the semester. The class covered a chapter each week. Students prepared for chapters by completing readings using reading guides prior to coming to class.

Each Monday, students completed an individual quiz and then completed the same quiz with their teams. Students had 15 minutes to complete each 20-item multiple-choice quiz individually. The allotted time for team quizzes was determined by how quickly teams completed the quiz, which varied based on the difficulty of the content; once 80% of the teams completed the quiz, the rest of the teams had 5 minutes to complete it. After the team quizzes, students participated in a muddiest points lecture, which lasted 10 to 30 minutes, to clarify content from the readings and quizzes.

Each Wednesday, students worked in their teams for 25 to 40 minutes to complete application exercises that consisted of multiple questions. Each question was designed for each team to work the same problems and make a single decision, which they reported simultaneously to the class; this is consistent with the structure described in the TBL literature (Michaelsen et al., 2004). Specifically, assignments within TBL should involve a problem that is significant to the students, all students should work on the same problem, students must make a specific choice, and groups should report their choices simultaneously (Michaelsen et al., 2004). Next, students had a full-class discussion about the decisions each team made. Students completed a formative team evaluation during the semester and then a final team evaluation at the end of the semester, both of which contributed to their final grade.

During the last week of the semester, students completed the same questionnaire about their perceptions of group work that they worked through at the beginning of the semester, with an additional five items specific to group work in the current TBL class, including an open-ended question: “How does your group work in this class compare to your past experiences with group work?”

Results

Pre- and Post-Test Student Perceptions

We conducted a paired *t*-test to compare students’ answers to the pre- and post-test survey items to evaluate if students’ perceptions of group work changed before and after taking a TBL class. We used Bonferroni correction to account for running multiple tests at once and set the cutoff for significance at $p<.004$ ($\alpha=.05/12$); being more conservative with the *p* value reduced the chance of a Type 1 error. Students were less likely to agree with the statement that “working in groups usually ends up with one person doing all of the work” at post-test ($M=2.17$, $SD=.87$), $t(65)=5.16$, $p<.001$, $d=.64$, compared to pre-test ($M=2.98$, $SD=1.05$). Students were more likely to agree with the statement that “working in a group makes me feel as though I am part of a learning community” at post-test ($M=4.35$, $SD=.64$) compared to pre-test ($M=4.02$, $SD=.77$), $t(65)= -3.6$, $p=.001$, $d=.44$. No other differences between the pre- and post-test means were significant (see Table 1).

Table 1. Pre- and Post-Test Mean Responses on a 5-point Likert scale.

Question	Pre-test <i>M</i> (<i>SD</i>)	Post-test <i>M</i> (<i>SD</i>)	<i>p</i>
Working in groups usually results in one person doing all of the work.	2.98 (.105)	2.17 (.87)	<.001*
I am able to learn from my peers.	4.61 (.52)	4.76 (.47)	0.04
Working with groups can help me understand other points of view.	4.73 (.45)	4.74 (.47)	0.829
Working in a group makes me feel as though I am part of a learning community.	4.02 (.77)	4.35 (.64)	0.001*
Working in groups can help me develop new skills and knowledge from members in my group.	4.48 (.59)	4.41 (.70)	0.34
I learn better from lectures than from working in groups.	3.21 (.85)	2.98 (1.10)	0.129
Solving problems in a group is an effective way to learn.	4.41 (.66)	4.39 (.58)	0.877
I have a positive attitude about working with my peers.	4.18 (.91)	4.29 (.80)	0.3
The ability to collaborate with my peers is necessary if I am to be a successful student.	4.33 (.92)	4.35 (.81)	0.885
Solving problems in a group is not an effective way to practice what I have learned.	1.71 (.86)	1.76 (.88)	0.75
Generally speaking, I like working in groups.	3.53 (1.03)	3.74 (.90)	0.051
Group work prepares you for your future career.	4.55 (.66)	4.53 (.64)	0.871

Note. In the Likert Scale, 1=strongly disagree and 5=strongly agree. *Paired *t*-test significant at $p<.004$. $N=68$.

Open-Ended Question Response

We focused on how students answered a single open-ended question in the dataset: “How does your group work in this class compare to your past experiences with group work?” The sample of 68 students provided 116 codable responses (see Table 2). In other words, many students provided more than one codable response. We evaluated student responses on two dimensions. First, we coded students’ overall responses in terms of whether they believed their group experiences in the TBL class were positive, negative, the same or similar, or neutral compared to their previous group work experiences. Overwhelmingly (110 out of 116 responses), students’ responses indicated that they perceived their group work in TBL to be a positive experience compared to their previous group work experiences. No students reported a negative experience with group work in the TBL course compared to previous group work, one student reported a neutral experience, and five students reported an experience that was the same as or similar to previous group work experiences.

Table 2. Percentage of Participant Responses Within Each Theme by Response Type

Response Type	Account.	Collab.	Group Quality	Other Themes	No Theme	Total
Positive	36 (33%)	22 (20%)	20 (18%)	13 (12%)	19 (17%)	110
Negative	0	0	0	0	0	0
Same-Similar	1	0	0	0	4	5
Neutral	0	0	0	1	0	1
Total	37	22	20	14	23	116

Note. Response Types were based on how the present group work experience compared to past group work experiences.

Second, we coded for specific themes that students reported. We identified three main themes based on students’ responses. One theme that emerged was accountability, which involved responses that indicated that teammates came to class prepared, that teammates’ preparation helped the success of the team, and that teammates contributed to the work equally (i.e., no one teammate did all of the work). Examples of responses coded under this theme include “This is the first time I’ve felt like group members have actually shared the workload” and “My group did a great job of being prepared.” Another theme was collaboration, which focused less on evaluating students’ individual preparation and effort than on their work with the actual team as a whole. Collaboration involved responses that indicated that the team worked well together, that they were cooperative, and that teammates participated. Examples of student

responses include “I feel like everyone contributed” and “My group worked really well together and shared the work evenly.” The theme of quality of group included responses that described the characteristics of team members or the team as a whole. For example, the motivation of teammates was included in this theme, such as “We had respect for each other and wanted to do the best for the group” or “[We were] all motivated to do well.”

We originally coded for other themes, including responses related to communication among teammates (“[TBL] was more interactive and discussion driven”), the long-term duration of the team (one student stating “Nothing long term like this”), and learning and education (“I felt like I learned a lot from the practical exercise”), but we had relatively few responses in these themes. These themes are grouped as other themes in Table 2. Finally, we established a no theme category for responses that did not fit with the other themes or address the open-ended question. The category covered a wide array of responses, from one-word answers such as “Better” or “Great” to responses such as “My group actually does work” and “Best group ever!” Thirty-seven responses (32%) were coded as the accountability theme, 22 (19%) of responses were coded as the collaboration theme, 20 (17%) were coded as the quality of group theme, 14 (12%) were coded as other themes, and 23 (20%) were coded as no theme when rounding percentages.

Discussion

Generally speaking, students indicated that they liked working in groups and had positive experiences with working in their groups. Students began the TBL class already having positive perceptions of group work in the classroom, and many of these positive attitudes toward group work did not change over the course of the semester. For example, students felt that working in groups helps them learn about others’ perspectives and develop new skills and knowledge, and that working in groups to solve problems is an effective way to learn. Students felt that collaborating with others is necessary for them to be successful as students and that group work prepares them for their future careers.

Students changed their views on two aspects of group work. At the end of the semester, students agreed less that group work results in one person doing all of the work, and students agreed more that working in a group makes them feel like part of a learning community. When students feel valued as a member of a learning community, they become more self-motivated learners (Davis & Murrell, 1993). Notably, the themes that emerged from the open-ended question about how students’ group work experiences in this class compared

to their group work experiences in other classes largely mapped on to where we saw the changes in their quantitative answers. Over half of the qualitative responses we coded were related to the accountability and collaboration themes.

The positive shifts evident in both the quantitative and qualitative data may be a function of the structure and components of TBL. Working in permanent teams for the duration of the semester may increase feelings of connectedness and as members of a learning community, which previous studies show decrease social loafing (Jassawalla et al., 2009; Springer et al., 1999). Having permanent teams may facilitate students getting to know each other and how to communicate effectively (Huckman & Staats, 2013), which is difficult to do if teams change throughout the semester. Additionally, the decreased perceptions of social loafing may be a result of the built-in accountability for team members to come to class prepared prior to participating in team work. Individual preparation also likely contributes to positive team experiences during the application exercises because everyone should be on the same page in terms of content knowledge by the time students work on the application exercises. Individual accountability coupled with accountability through team evaluations may have also decreased perceptions of social loafing, and is consistent with previous literature that evaluations are effective (e.g., Karau & Hart, 1998).

Although the literature is mixed in terms of the effectiveness of TBL for content mastery (e.g., Carmichael, 2009; Jakobsen & Daniel, 2019; Jakobsen et al., 2014; Travis et al., 2016; Zingone et al., 2010), TBL's structure may provide value above and beyond this goal. For example, it provides opportunities for students to practice valuable transferable skills that are necessary in the workforce and allows students the chance to build a better understanding of themselves and others. In a 2018 survey of employers on student learning objectives, a majority of employers indicated that individual accountability, teamwork, communication, and problem-solving skills are all very important (Hart Research Associates, 2018). The TBL structure places emphasis on building these skills.

Limitations and Future Directions

Students had good perceptions of working in teams coming into the semester, so there was not much room for them to improve their perception. Many students in the psychology major have access to other classes in which they have to prepare individually prior to working with others during class, which may have provided students with positive experiences before coming to

this class. Students with less experience with group work (or with less positive group experiences) may come into a TBL class with less positive perceptions of group work and may therefore show positive changes in perception of group work after participating in a group work structure within the TBL context. However, we did see that students' perceptions improved on two important dimensions—social loafing and being members of a learning community—which is promising evidence that the structure of TBL can help mitigate concerns of working in teams.

Another limitation of our data is that it is quasi-experimental. While we were able to show changes in student perception within a TBL class from pre-test to post-test, further research is needed to demonstrate that the positive changes in group work were due to TBL specifically and not group work in general or other variables. A replication of this study with the addition of a control group would strengthen the design and provide further evidence. Future research should also explore other factors that may impact students' perceptions of group work. Individuals with diverse cultural backgrounds, personality traits, and genders may have very different experiences working in groups (Myers et al., 2009; Šerić & Praničević, 2018). For example, students who score higher on introversion may experience group work in a different way than students who score higher on extroversion (Persky et al., 2015), and their peer evaluation scores may be negative because face-to-face interactions may be challenging for them (Voorn & Kommers, 2013). The existing literature on the relationship between introversion, extroversion, and group work in higher education is limited (e.g., Watson et al., 2010).

While restructuring an entire class to use TBL may be daunting, the principles of team work that provide positive experiences for students can be incorporated into almost any class. Ensuring individual accountability prior to team work, using permanent teams, and having students complete team work during class may be achieved in many courses, no matter their structure or content; even online environments can have synchronous meetings that facilitate teams working together at the same time. These learning settings can provide opportunities for further research that examines the intersections between individual students' quantitative and qualitative responses to TBL.

Authors' Note



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Lauren Ferry ('19) graduated summa cum laude with a degree in Psychology and a minor in Philosophy. She is currently in the Clinical Psychology doctoral program at Xavier University. She hopes to work as a therapist with children and adolescents. Lauren thanks Dr. Krisztina

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Phillip J. Wong ('19) graduated with a degree in Psychology and a minor in Sociology. He hopes to earn his master's degree in Library and Information Science in pursuit of a career as an archivist. His interests include cooking, reading, playing piano, and working in academic

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Kathryn Hogan

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