The Use of Peer Review in Student Teams: An Impetus to Improved Performance?

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Collaborative assignments and projects, which invariably involve teamwork, are considered a high impact practice (HIP) in higher education. In spite of this, universities and academic programs within them, such as those in schools of business, may not emphasize or measure teamwork as part of required learning assessment plans for accreditation. Additionally, students may resist team assignments due to frustrations with social loafing, difficulties coordinating schedules, lack of confidence, or perceived inequalities in workload. This study examined the efficacy of peer performance reviews of teamwork. The purpose of these reviews was to encourage individual accountability, improved performance, and teamwork skill development. Findings demonstrated that performance ratings did not improve during the semester nor did participation in the review process. Also, students tended to give very high or very low scores. Implications suggest that refinements to the assignment are needed to encourage more effective feedback.

Keywords: high impact practices, teamwork, performance reviews, peer review

INTRODUCTION

Collaborative assignments and projects, which invariably involve teamwork, are considered a high impact practice (HIP) in higher education (Kuh, 2008; Kuh, & O'Donnell, 2013; Kuh, O'Donnell, & Schneider, 2017). HIPs engage students in purposeful, integrative learning aimed at developing essential learning outcomes such as communication, problem solving, teamwork, critical thinking, and quantitative and information literacy (Kuh, 2008). Studies show that students who participate in these practices, and particularly those who are historically underserved by higher education, improve their performance and have higher persistence and graduation rates (Finley & McNair, 2013; Kuh & Kinzie, 2018).

Employers across sectors have consistently ranked teamwork as a critical skill along with other essential learning outcomes such as written and oral communication, ethical decision making, critical thinking, and the application of knowledge (Association of American Colleges and Universities [AAC&U], 2011; Hart Research Associates, 2015). Collaborative assignments involve the development of teamwork skills as

students work together to solve problems and listen to diverse viewpoints to increase their understanding (Kuh, 2008).

In spite of this, universities and academic programs within them, such as those in schools of business, may not emphasize or measure teamwork as part of required learning assessment plans for accreditation. For example, in 2007, 42% of AACSB-accredited business schools evaluated teamwork (Martell, 2007). This decreased to 26.5% in 2010 (Kelley, Tong, & Choi, 2010). In 2015, no business schools reported measuring teamwork as part of their assessment plans (Wheeling, Miller, & Slocombe, 2015). The primary assessment methods reported were rubric-scored assignments, test questions, and standardized exams (Wheeling et al., 2015).

Certainly, students may resist team assignments due to frustrations with social loafing, difficulties coordinating schedules, lack of confidence, or perceived unfairness if some contribute more than others (Pfaff & Huddleson, 2003; Schultz, Wilson, & Hess, 2010). However, the benefits are extensive; they include deep learning (Ohl & Cates, 2006; Scott-Ladd & Chan, 2008; Volkov & Volkov, 2015; Wageman & Gordon, 2005), motivation, professional skill development (Volkov & Volkov, 2015), content understanding, critical thinking, learning retention (Biggs & Tang, 2011; Hall, Ramsay, & Raven, 2004), decreased work and anxiety, and improved deliverables (Schultz et al., 2010).

The use of HIPs in a university or program does not guarantee the outcomes with which they are associated. In other words, simply incorporating teamwork into a course does not translate into the development of teamwork skills. HIPs must be connected with specific goals at the program or institutional level (Kuh & Kinzie, 2018). As such, courses must be intentionally designed to help students develop desired behaviors. This study examined one such course element—peer performance reviews of teamwork. The purpose of these reviews was to encourage individual accountability, improved performance, and teamwork skill development. The research question for the study was—do peer reviews help students improve their performance on subsequent assignments (as measured by peer ratings)? The goal of this study was to explore the efficacy of peer review as a means to teamwork skill development and address some of the challenges associated with team assignments.

LITERATURE REVIEW

The literature review for this study focuses on two key areas. First, we briefly examine performance reviews—their purpose, challenges, and benefits, as well as approaches for conducting reviews. Second, we focus on the benefits of teamwork for students as well as logistics and evaluation methods that need to be considered when designing team assignments. The performance review literature informs peer review practices for student teams.

Performance Reviews

When done well, performance reviews can be an essential part of an employee's professional growth and development. Reviews typically provide an opportunity to identify strengths and weaknesses, inform promotion decisions, compare performance with job characteristics, provide coaching, set goals, and begin disciplinary processes if needed (Clark, 2013). Managers must know their employees well in order to accurately evaluate their performance (Schindler, 2013). This may entail gathering information from people with whom the employee interacts (Schindler, 2013). Managers must communicate both negative and positive aspects of performance and ensure that conversations are two-way (Schindler, 2013) to allow employees to respond to feedback (Bull Shaefer, 2018).

While performance reviews are a useful tool, they can be problematic if not conducted appropriately (Clark, 2013). Reviews often fail to change behaviors and dissatisfaction with them may result in dissatisfaction with the job (Dusterhoff, Cunningham, & MacGregor, 2012). Perspectives on reviews are influenced by the employee's perceptions of fairness and supervisor-employee relationships (Dusterhoff et al., 2012). Another issue is that managers may "avoid confrontation and limit criticism" (Fong & Li, 2016, p. 20; Bernardin and Buckley, 1981; McGregor, 1957; Prendergast, 1999), referred to as leniency bias (Holzbach, 1978). Spillover effect, in which an employee's current performance is evaluated on the basis

of past performance, may also be a problem (Bol & Smith, 2011). Managers need to be comfortable providing feedback on both positive and negative aspects of performance (Schindler, 2013). Assuring due process in which employees know what is expected, have time to prepare, and know the consequences of reviews is critical (Bull Schaefer, 2019). However, reviews are often limited in value due to the inability of managers to give effective feedback and associated employee stress; additionally, employees may not know what to do with the feedback (Bull Schaefer, 2018).

In recent years, dissatisfaction with performance reviews has increased (Alder et al., 2016; Wilkie, 2015). Annual reviews are often viewed as ineffective due to their infrequency and to the use of restrictive rating scales, and in some cases, have been replaced by coaching (Barry, Garr, & Liakopoulos, 2014; Rock & Jones, 2015). Although annual reviews are often required by company policy, the intent may be that coaching or performance checks occur on an on-going basis with the formal review serving as a conversation for goal setting (Clark, 2013). Having more frequent reviews, however, does not necessarily result in more effective reviews (Bull Schaefer, 2018). Due to the challenges associated with performance reviews, some organizations are discontinuing them (Bull Shaefer, 2018). By eliminating ratings and focusing on performance management, managers are able to align employee goals to organizational goals, set aside specific times to examine results, and eliminate barriers that employees feel prevent success (Alder, 2016).

An alternative approach to traditional supervisor-centered performance reviews is obtaining feedback on performance from a variety of sources. Such is the basis of 360 degree feedback tools, which purport to "establish a culture of continuous learning and provide more global feedback for employees, which leads to improved performance" (Qureishi, 2020, p. 56). These tools entail self-evaluation as well as evaluation from colleagues or peers within and external to the organization, and from direct reports. The raters are selected by the employee and feedback is anonymous. These surveys can be used at any level of an organization to provide insights into how an employee interacts with others, particularly as supervisors are sometimes limited in their opportunities to observe employees. Obtaining multiple sources of feedback regarding one's performance can increase self-awareness, encourage dialogue about performance and behaviors, improve accountability, strengthen relationships, provide impetus for personal development, and enhance performance (Rogel, 2017).

Managers, and future managers enrolled in business and management courses, need to develop the competencies to perform, and respond to, performance reviews (Bull Schaefer, 2018). In educational contexts, midterm performance reviews provide students with the opportunity to build confidence for future work-related reviews through observation and practice (Bull Schaefer, 2018). They also address the challenge of students not paying attention to instructors' written comments on assignments. Instructor-student reviews should review goals that students set at the beginning of the semester and be based on multiple sources of assessment related to class performance. Following these individual reviews, instructors can hold a whole-class debriefing. Certainly, a number of different approaches to performance reviews can be adopted in business and in management courses both for purposes of evaluation and to help students develop the ability to give and receive feedback.

Student Teams

Teamwork is highly valued by employers (CPA, 2012; Hart Research Associates, 2015; Rhee, 2013). Because of this, faculty members are increasingly incorporating it into their courses in order to prepare students for their future careers. In educational contexts, teamwork has been shown to result in outcomes such as improved motivation and professional skill development (Rhee, 2013; Volkov & Volkov, 2015), deep learning as students take responsibility for and engage in coursework (Ohl & Cates, 2006; Scott-Ladd & Chan, 2008; Volkov & Volkov, 2015; Wageman & Gordon, 2005), and critical thinking, better subject matter mastery, and increased knowledge retention (Biggs & Tang, 2011; Hall et al., 2004). Teamwork provides an environment in which students can acquire new competencies, recognize their capabilities, and develop leadership skills as they collaborate with their peers to achieve their goals.

Typically, students need guidance and structure for teamwork to be successful. This might include helping them understand the characteristics of teams and how teams operate, particularly that leadership is

shared, decisions are made through discussion, members work together to solve problems, and teams have both individual and collective responsibility for assigned tasks and outcomes (Rico, Sanchez-Manzanares, Gil, & Gibson, 2008). Models for effective teamwork, such as Katzenbach and Smith's framework for high performing teams (1993, 2015), can be shared to illustrate that the desired outcomes of teamwork—work products, performance results, and personal growth—depend on the commitment, skills, and accountability of team members. In short, a team is ""a small number of people with complementary skills who are committed to a common purpose, set of performance goals, and approach for which they hold themselves mutually accountable" (Katzenback & Smith, 1993, p. 2). Students need to understand the value of having a common purpose; the benefits of conflict and different personality types; the need for roles, responsibilities, and processes; and the importance of performance feedback (Andrade, 2020).

Students resist teamwork for a variety of reasons such as the logistics of scheduling team meetings or problems with social loafing (Cheruvelil, De Palma-Dow, & Smith, 2020; Pfaff & Huddleson, 2003; Schultz et al., 2010). However, these concerns can be addressed by providing class time for teamwork, facilitating problem resolution, and ensuring that students have opportunities to give and receive feedback (Hansen, 2006; Pfaff & Huddleston, 2003; Schultz et al., 2010). Instructors should include a learning objective related to teamwork in the syllabus, engage students in activities that teach them the benefits of teamwork and effective teamwork practices (e.g., norms and behaviors), and require individual and team reflections in order to encourage positive attitudes toward teamwork (Cheruvelil et al., 2020). Although students may initially resist teamwork, as they engage in it, they begin to recognize its value. They realize that collaborative projects can result in less work and better deliverables due to the diverse ideas and skill sets of their team members (Schultz et al., 2010).

Logistics

In addition to helping students understand the rationale for teamwork and the characteristics of effective teams, faculty members who incorporate teamwork in their courses have a number of decisions to make regarding logistics such as team size and team formation. Teams should be small enough to allow for meetings to be set up conveniently and for ease of communication (Katzenbach & Smith, 1993, 2015). They must also be large enough to increase the likelihood that members will have all the skills needed to perform their assigned tasks and have a variety of ideas for approaching tasks and solving problems. If team members do not have adequate skills, they should to be willing to develop them (Katzenbach & Smith, 1993, 2015). Students may complain if they perceive that their teams are too large or too small and it may be difficult for faculty members to divide the class into teams of equal and ideal size due to the unpredictability of students adding and dropping the class. It can also be a challenge if a team lacks a needed ability such as good writing skills or technology expertise; however, students can learn and improve these skills. Instructors need to consider that smaller teams may not have the needed skill sets, but larger teams may be difficult to organize (Andrade, 2020).

Students may prefer to select their own team members, particularly if they know other students in the class. Teams who do select their own members, as opposed instructor-established teams, have been shown to meet more frequently outside of class (Post, Barrett, Williams, & Scarff, 2020). However, instructor-established teams whose members were matched according to their academic performance achieved higher team grades (Post et al., 2020). In both conditions, students were equally likely to form new friendships. Also, in both cases, from midterm to the end of the course, students became less concerned over grades, less focused on tasks, less likely to immediately start work in meetings; they also met more often outside of class and less often reported doing work for teammates. In another study, in a business course in which student teams worked on a startup venture project, those with an equal gender mix had better performance than male-dominated teams (Hoogendoorn, 2013).

Generally, research on random assignment of team members by the instructor compared to self-selection by students has had mixed results (Chapman, Meuter, Toy, & Wright, 2006; Matta et al., 2010; Pociask et al., 2017). A drawback of random assignment is that teams may not have all the needed skills (Bacon, Steward, & Anderson, 2001; Chapman et al., 2006) unless faculty members collect information about the students or know them well enough to strategically create teams with the requisite skills and an

appropriate mix or personalities. A disadvantage of self-selection is that this may create feelings of isolation if students choose their friends and others are left out or do not know anyone in the class. In a large scale empirical study, self-selected teams reported better communication, enthusiasm, conflict resolution, friendship formation, value, pride in work, and other positive outcomes, but instructor-formed teams were more task-focused due to less socializing. (Chapman et al., 2006).

Teamwork Evaluation

A particularly important logistic for setting up teams and team assignments is how to fairly evaluate both individual and collective contributions. Students may feel it is inequitable if some team members do more work than others, yet all receive the same grade. As such, evaluation approaches must be carefully considered. A common method is peer review, which can take many forms.

Various scales and rubrics have been developed for the purpose of both self and peer evaluation such as the CATME (Loughry, Ohland, & Moore, 2007) and CATME-B (a shortened form of the CATEM) (Ohland et al., 2012) as well as the VALUE rubric (Rhodes, 2009). The CATME has five dimensions: "contributing to the team's work, interacting with teammates, keeping the team on track, expecting quality, and having relevant KSAs [knowledge, skills, and abilities]" (CATME, 2020, para. 1) with students identifying behaviors that best represent themselves and their team members. The VALUE rubric is designed to assess team members on the following: "contributes to team meetings, faciliates the contributions of team members, individual contributions made outside of team meetings, fosters a constructive team climate, responds to conflict" (AAC&U, 2009). The rubric has a rating scale of 1-4 with descriptors for each category and numerical rating.

Both instruments present opportunities for self-reflection, team reflection, and peer evaluation. One study showed that when team members provided feedback to their team leader by means of the CATME part way through a class project, their perceptions of team effectiveness increased (Campbell, 2019), showing that the act of providing feedback may have value in itself. The VALUE rubric focuses on team member behaviors and processes, specifically the "effort they put into team tasks, interactions with others, and the quantity and quality of contributions they make to team discussions" (AAC&U, 2009, para. 2). As such, it provides opportunities for teams to openly consider and discuss their own and others' performance.

Another peer evaluation approach is to give students a certain number of points (e.g., 50 or 100) to distribute among team members (Erez, LePine, & Elms, 2002; Michaelsen, Knight, & Fink, 2004). They must also provide rationale for the points they award. This prevents them from giving all team members the same number of points, forces them to make a judgment, and to consider reasons for their judgments. Faculty members can also have students create their own criteria based on what they feel is important (Thomas, Martin, & Pleasants, 2011). Reflection papers to measure one's own performance and offer formative or summative assessments of teammates are additional possibilities (Fellenz, 2006). To be effective, points for reviews should count toward students' grades (Fellenz, 2006; Fink, n.d.).

Another consideration is the frequency of reviews—feedback at midterm is a formative way to allow students to make needed changes and avoid surprises at the end of the semester, particularly when points assigned by team members count toward grades. Points can be awarded for team contributions at both midterm and at the end of the semester. In one study, MBA project team members evaluated themselves and their teammates on leadership characteristics three different times during their degree program; participants' self-ratings decreased after receiving this peer feedback (Mayo, Kakarika, Pastor, & Brutus, 2012), suggesting that the feedback helped them see their performance from a different perspective, causing them to alter their self-appraisals.

Personality and ability (as measured by GPA) can impact peer evaluations. A multidisciplinary study showed that students with higher levels of emotional stability (e.g., tendency to be calm or not easily distressed) were less likely to feel that all group members shared equal responsibility (Rhee, 2013). Students with higher GPAs tended to report more team conflict, but GPA had little impact on perceptions of performance. Teams high on agreeableness (e.g., being open to new experiences and having a warm personality) reported less conflict. Instructors scored teams with extraverted members higher on written reports and oral presentations.

Similar to performance reviews in the workplace where managers may be reticent to provide negative feedback, lack confidence in their ability to conduct effective reviews, or simply want to avoid conflict, students may also be subject to these limitations, primarily because they do not have the sufficient skill or training to conduct accurate reviews (Kruger & Dunning, 1999; Jassawalla, Sashittal, & Malshe, 2009; Walker, 2001). To address this, faculty members should review the purpose for the assignment, the criteria or scale being used, and provide examples of what constitutes different points on the scale. They can also engage students in a discussion of what students feel is most important, relevant, and fair.

Performance Reviews in Context

Approaches to performance reviews in both professional and educational contexts are varied and have both strengths and weaknesses. As discussed, in professional contexts, alternate forms of performance reviews that entail multiple sources of feedback, self-reflection, and goal setting are increasing being used and replacing traditional top-down managerial evaluations. The same is true of performance reviews for student teams and team assignments. The traditional practice of the faculty member providing feedback needs to be supplemented with peer review as well as team and individual reflection to improve accountability and enhance the development of teamwork skills.

As students engage in teamwork, they practice the managerial functions of planning, organizing, leading, and controlling, known as POLC, based on the work of Henri Fayol in 1916. Previous research has found that teamwork results in the development of skills related to these managerial functions, thus preparing students for the world of work (Andrade, 2019; Andrade, Miller, & Ogden, 2020). However, different approaches exist for encouraging individual and team accountability. Peer review is one of these approaches. A number of variations exist for effective peer review. Based on the generally accepted value of peer review and criticisms of single, annual evaluations, as shown in this research review, the primary hypothesis for the current study is that formative, on-going peer review throughout the semester will help students improve their performance on subsequent tasks.

METHODS

In this study, students in an introduction to organizational behavior course completed performance reviews of their team members after each team assignment. There were five team assignments in the course. The first four involved students discussing and resolving a management challenge by applying the organizational behavior theories and concepts they were studying. The fifth assignment was a consulting project wherein students connected with an organization in the local community to identify an organizational behavior problem, collect data related to the problem, and make recommendations based on theories. All of these assignments were compiled into a team ePortfolio, also a high impact practice (Watson, Kuh, Rhodes, Light, & Chen, 2016). The course is required for all business and information systems majors at the university where the study occurred and is a recommended elective for several other areas of study.

The performance reviews were set up in a Google form that was embedded into the peer performance review assignment in the learning management system for the course. Team members assigned a score to each of their teammates accompanied by a brief rationale. Scores were then averaged for each team member and entered as a grade for the assignment in the learning management system along with the rationale for the scores. The student teams also completed a performance review halfway through the course where they discussed what was working and what was not and what they could do to make needed changes. They were encouraged to discuss the value of the peer reviews and how these could be improved if needed. It should be noted that students did not get points for doing the peer reviews; their assignment grade reflected only the average of the points from their teammates.

Specifics for the assignment are provided in Figure 1. The suggested criteria for the reviews was informed by the VALUE rubric (described in the literature review) but primarily designed to address issues that class teams typically experience as identified in end-of-semester individual student reflections. The

criteria were provided to encourage consistency in ratings of team members but also allow for students to bring in factors they felt were relevant.

FIGURE 1
PERFORMANCE REVIEW ASSIGNMENT

Instructions
Complete the form to rate the performance of yourself and your team members on this task. This rating is important in helping each other develop team skills and helping your team be effective. Be open and honest but also encouraging. Help each other be successful. Below are some criteria you might consider when determining your ratings. Also below is a scoring guide.

Criteria
Class/meeting attendance.
Participation in generating ideas and decision-making.
Completion of work in a timely manner and by agreed-upon due date.
Timely and effective communication with other team members.
Overall contribution to the assignment.

Scoring Guide
0 = no participation
6 = weak performance
7 = satisfactory performance
8 = good performance
9 = excellent performance
10 = exceptional performance

Please submit a score as well as comments related to the criteria and anything else you feel is pertinent. Your ratings will be kept anonymous. Team ratings count for 4% of the final grade.

The total number of participants in the study was 142. Students were in four sections of the course; two sections were delivered in a blended modality and two were completely online. Team size ranged from 4-8 with an average pf 6. Team sizes differed due to students adding and dropping the course at various times.

The analysis of the data was conducted using Python software and Microsoft Excel. The data was collected from Google Sheets that were set up in a way that they automatically collected information from the Google forms where students entered their performance reviews. Python was used to transform and analyze the data as well as visualize it as needed. Excel was used mainly for data organization and formatting.

The first step was to clean up and combine the data in the Google Sheets because it was split by class section, team, and performance review. Utilizing the Pandas library in Python, data cleaning and transformation were conducted so that the data frame had columns such as student name, score given, justification (comments), and performance review. Thereafter, the analysis was carried out by taking descriptive statistics, aggregating the data by groups, and summarizing the count and frequency of the data for each performance review.

The sentiment label on students' comments was manually reviewed by going through each comment and labeling it into one of the three categories: positive, neutral, and negative. For the analysis of these comments, the frequency of each comment type was calculated grouped by students and performance reviews. In order to see the impact that the sentiment of these comments had, the students' score trends were compared with the frequency of each comment type.

RESULTS

The research question for this study was to determine if on-going peer performance reviews would help students improve their contributions to their teams and ultimately help them enhance their teamwork skills. In addition to determining any score improvements, analyses were performed to provide further insights into the effectiveness of the peer review assignment. These included examining the range of scores students assigned, level of participation in the assignment, and the types of comments students provided to either commend their teammates or encourage improvement.

Score Improvement

More and more students had a decrease in scores towards the end of the semester. For example, from performance review 1 to performance review 2, 28% of all students had a decrease in their scores. From performance review 4 to performance review 5, scores of 44% of the students has declined (See Table 1). Overall, it appears that students did not improve their scores, but many had ups and downs depending on the particular performance review. Thus, the hypothesis that timely, on-going peer review throughout the semester would help students improve their performance on subsequent assignments was not supported.

TABLE 1
SCORE IMPROVEMENT BETWEEN PERFORMANCE REVIEWS

Performance Review	1 - 2	2 - 3	3 - 4	4 - 5
Score Increased or Stayed the same	71.7%	63.9%	62.5%	56.3%
Score Decreased	28.3%	36.1%	37.5%	43.8%

Score Range

As shown in Table 2, the scores students gave each other all tended to be high with a mean score of over 8.5 in each performance review. Most scores were 10, which comprised over 66% of all scores. However, it is interesting that the score of 0 is the 4th most given score. Students were rarely given scores of 1~6 (see Table 2 and Figures 2 and 3). Students tended to award high scores unless teammates did very poorly.

TABLE 2
SCORE RANGE TREND BY PERFORMANCE REVIEW

Performance Review	mean	std	min	max
1	8.5	2.3	0.2	10
2	9.2	1.3	1.2	10
3	8.9	2	0	10
4	8.7	2	0	10
5	8.5	2.2	0	10

TABLE 3
OVERALL INDIVIDUAL SCORE RANGE, COUNT AND RELATIVE FREQUENCIES

mean	std	min	max
8.8	2.5	0	10

FIGURE 2
COUNT FREQUENCIES

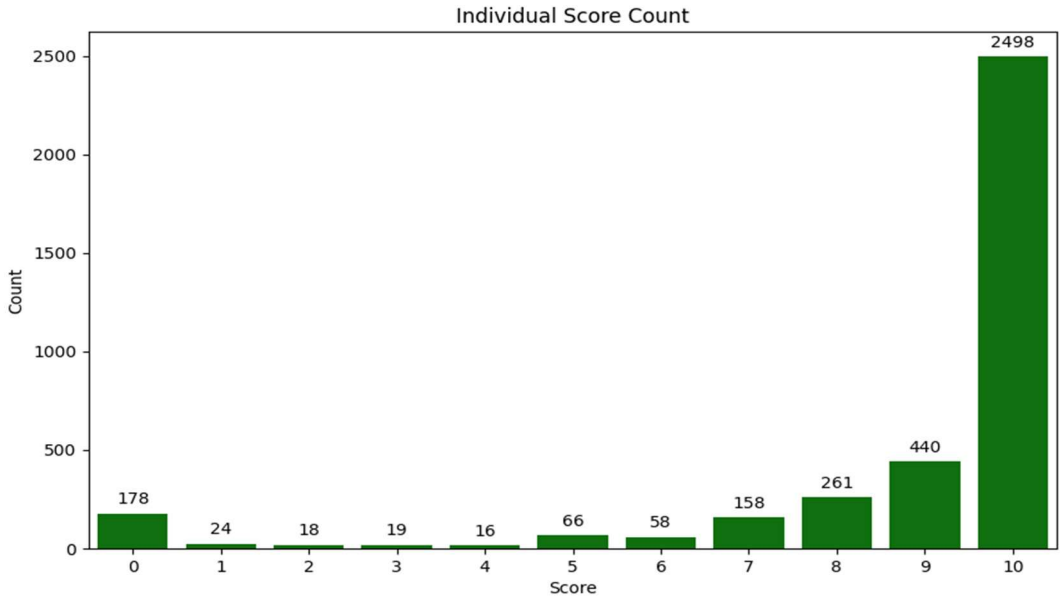
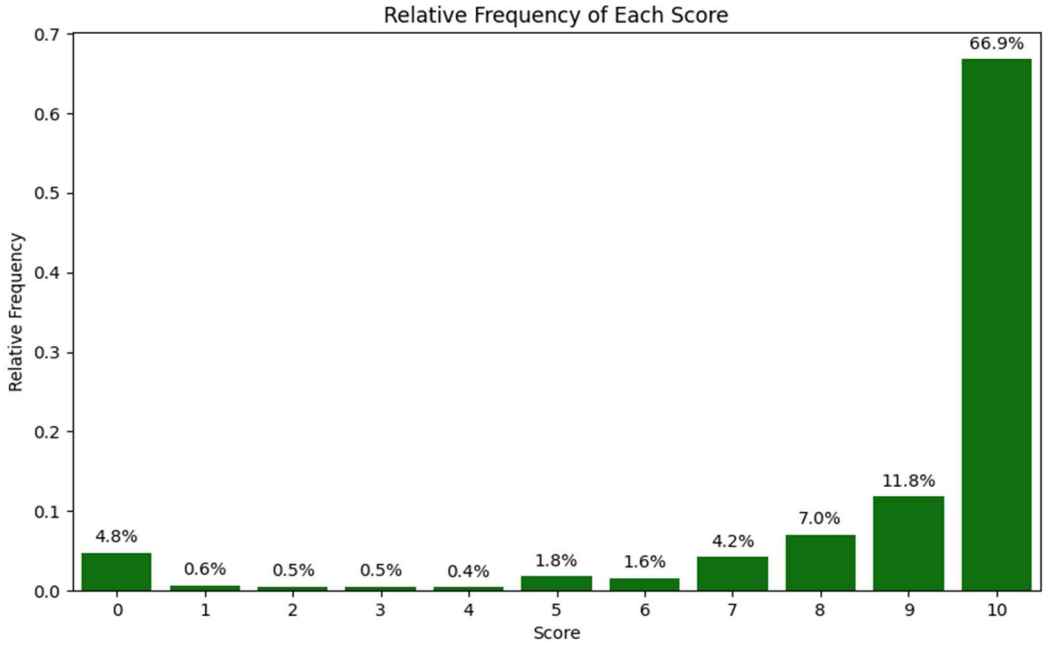


FIGURE 3
RELATIVE FREQUENCIES



Assignment Participation

As the peer review data was collected and scores and comments distributed to students, it became apparent that some students were not submitting reviews; thus, this aspect of the peer review assignment was also examined. Performance reviews 4, 3 and 2 were the performance reviews that students missed submitting the most frequently (See Table 3). Students tended to participate less in the middle of the semester than in the beginning and at the end. Students may have had a fresh start at the beginning of the semester and also tried to finish up with a good note at the end. It appears that students became busy with other responsibilities in the middle of the semester and missed performance review submissions. Also, it is interesting that quite a few students missed all of the performance reviews—a total of 3.5%.

TABLE 4
PERFORMANCE REVIEWS NOT SUBMITTED – TOP 5

Performance Review Missed	Count	Relative Frequency
4	11	7.6%
3	10	6.9%
2	6	4.2%
1, 2, 3, 4, 5	5	3.5%
1, 3	4	2.8%

Comments

The comments students provided, designed to help team members develop effective team skills, and consequently, improve the functioning of the team, were also analyzed. As expected, the majority of comments were positive (see Table 4). This aligns with the result that most of the numeric ratings were scores of 10. Except for performance review 1 in Table 4, the overall trend is consistent with the trend shown in Tables 1 and 2, showing a decrease in students' scores. Figure 4 shows that the percentage of positive comments also decreased, and the percentage of negative comments increased towards the end of semester. As to if the sentiment of comments that students made had any impact on their performance in the next challenge, no strong relationship was found in the data.

However, a negative sentiment seemed to have a moderately strong impact on students' scores in the following assignment, meaning that if a student received a negative comment from his or her peers, he/she would receive an increase in score in the next challenge. Although the data showed some association between the sentiment of the comments and the increase in students' scores in the following challenge as Table 5 shows, it should be noted that none of the correlation values were particularly strong. One of the reasons for why positive comments did not show much correlation is possibly that students who performed well continued to perform well throughout the semester.

TABLE 5
PROPORTION OF POSITIVE, NEUTRAL, AND NEGATIVE COMMENTS

Performance Review	positive	neutral	negative
1	78.8%	11.6%	9.7%
2	91.7%	4.5%	3.7%
3	90.5%	3.8%	5.6%

4	87.2%	4.0%	8.8%
5	82.3%	6.1%	11.6%
Avg	86.1%	6.0%	7.9%

FIGURE 4
PEARSON'S CORRELATION ON THE INCREASE IN SCORE BETWEEN PERFORMANCE REVIEWS AND THE RELATIVE FREQUENCY OF EACH COMMENT TYPE

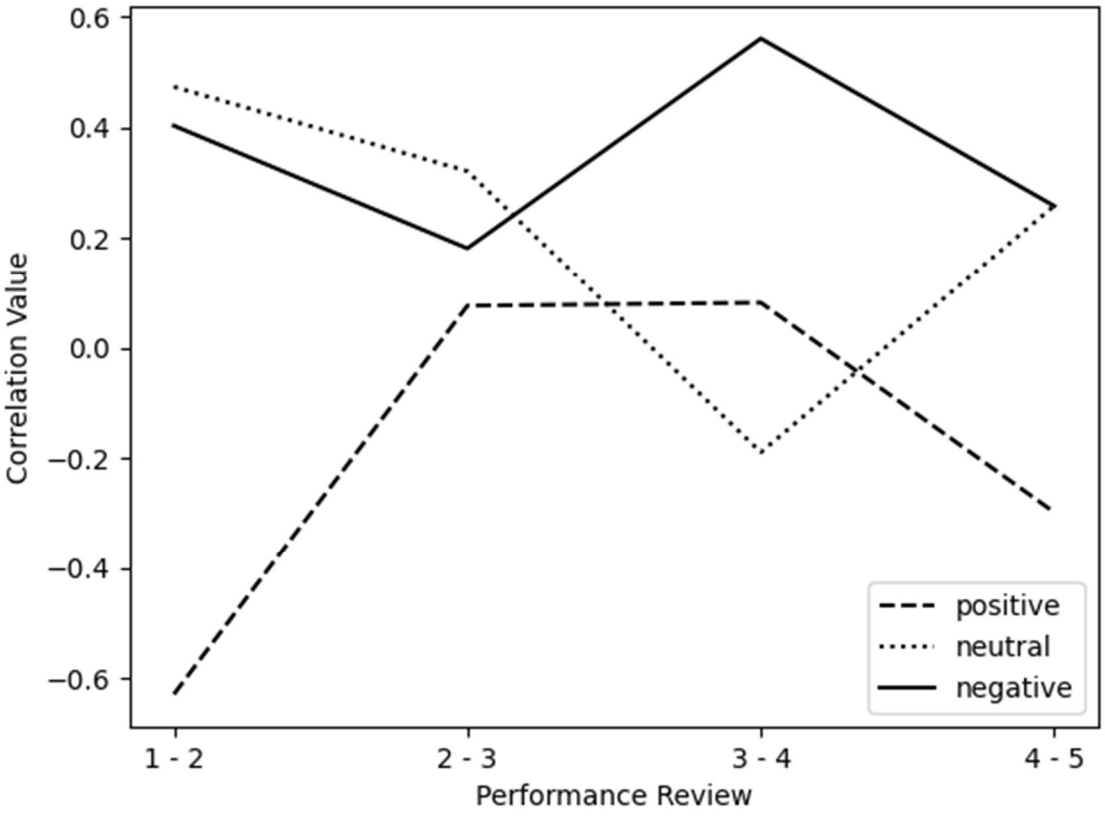


TABLE 6
RELATIVE FREQUENCY OF EACH COMMENT TYPE

Performance Review	positive	neutral	negative
1 - 2	-0.63	0.47	0.40
2 - 3	0.08	0.32	0.18
3 - 4	0.08	-0.19	0.56
4 - 5	-0.30	0.26	0.26
Avg	-0.19	0.22	0.35

DISCUSSION AND IMPLICATIONS

Although information from multiple sources to understand how employees, or in this case students, interact with others and how they are perceived by others is of value in encouraging improved performance (Schindler, 2013), there was little evidence of this in the current study. The observation that more frequent reviews does not necessarily mean more effective reviews (Bull Schaefer, 2018) was found to be true. Also evident was that individuals may not give effective reviews and recipients of performance reviews may not know how to act on the information (Bull Schaefer, 2018). A number of actions are next suggested to address the structure of the peer review process in order to improve outcomes.

One recommendation is to give a description for each score. As mentioned earlier, students tended not to give scores that did not have a description such as scores of 1~6, but quite a few students gave the score of 0, which is the only lower end score that had a description in the performance review assignment guide (see Figure 1). It might be that students were not sure how to score their peers who were performing poorly because there were no descriptions associated with the lower scores. Also, it is possible that students might not have felt comfortable giving low scores to their peers unless they performed very poorly; this resulted in a lot of 0s and 10s. If the instructor provided a description label for each score, students might be clearer about what the scores represented, and this would result in score variation reflective of different levels of performance.

There may be other factors accounting for this scoring pattern as well. The practice of giving mostly positive reviews or very low scores when students did not participate at all is similar to the weaknesss noted of performance reviews in general. Managers often have difficulty with transparency in discussing both strengths and weaknesses in an employee's performance (Fong & Li, 2016) and rating scales are often viewed as problematic (Alder et al., 2016; Wilkie, 2015). Leniency bias may have also been a factor (Holzbach, 1978). Similar to real-world performance reviews, the student peer reviews had a limited impact on changing behaviors (Dusterhoff et al., 2012), possibly because students were not graded on their reviews or did not see the reviews as making much of a difference in behaviors. Similar to many managers, the students may have felt inadequate or unprepared to provide helpful reviews (Kruger & Dunning, 1999; Jassawalla et al., 2009; Walker, 2001).

To address this, another change to consider would be to modify how students give their peers comments on their performance. It may be possible to create a list of predefined sentences that students could choose from to express their sentiments about their peers' performance. In this way, the sentiment analysis of students' comments would be less biased in the sense of relying on the analyst to interpret and categorize the comments. This would also depersonalize the feedback and ensure that is it worded constructively. Also, by having students choose from given options, they would feel more at ease submitting their performance reviews because it may take less time than writing their own comments. This could result in increased assignment completion, more effective feedback, and improved performance.

Additionally, the rating scale could be more specific to encourage students to use the full range of points. One possibility is provided in Figure 2. This scale is based out of 50 points and focuses students' attention on teamwork skills. It also demonstrates how the points translate to percentages so that students recognize how scores will affect grades. Training could be provided to help students calibrate their scores based on the scale and develop the skill of providing effective feedback (e.g., see Kruger & Dunning, 1999; Jassawalla et al., 2009; Walker, 2001). This would help prepare them for real-life performance reviews and address the issue of managers' inability to provide employees with effective feedback (Bull Schaefer, 2018). Training would involve having students examine examples of effective and ineffective feedback, or as mentioned earlier, given them options from which to select.

FIGURE 2
EXAMPLE RATING SCALE

Rate yourself and each of your team members with a score out of 50 based on the following criteria:

Participation in generating ideas, organizing tasks, and decision-making.
Completion of work in a timely manner and by agreed-upon due date.
Timely and effective communication with other team members.
Quality of contributions.
Overall contribution to the team.

0-10 (0-20%) = minimal or no participation
30-34.5 (60-69%) = weak performance; very little demonstration of teamwork skill
35-39.5 (70-79%) = somewhat satisfactory performance; still developing teamwork skills
40-44.5 (80-89%) = good performance; several teamwork competencies demonstrated
45-46.5 (90-93%) = strong performance; competent in most aspects of teamwork
47-50 (94-100%) = exemplary performance; strong and fully contributing team member

Please submit a score for yourself out of 50 points and for each team member as well as comments related to the criteria and other information your feel is pertinent. Your ratings will be confidential.

In the current study, students were given guiding questions in their midterm team evaluation assignment to assist them in discussing the effectiveness of the peer performance reviews. Even though they were asked to discuss the scores and feedback they were receiving as part of this reflection, it may be that they were reticent to do so. This could be strengthened by assigning points specifically to this aspect of the assignment. Students could also be asked to individually report on how they used the feedback to encourage accountability.

The assignment could also be set up so that students receive points for evaluating each other and as well as the scores from their team members. This would likely involve two different assignments. For the first assignment, the instructor would need to identify the students who submitted each week and examine the quality of their responses and assign scores accordingly. The second assignment would consist of the averages of the peer scores accompanied by comments as occurred in the current study. This modification would motivate more students to submit scores for their team members.

The peer performance approach described was work intensive for the instructor in terms of setting up review forms for each team with the names of each team member, creating spreadsheets to calculate the average points for individual students, and transferring the scores and comments into the learning management system. This had to be done for each of the five team assignments. The help of a student teaching assistant is recommended. Additionally, the learning management system could not accommodate the assignment design; thus, Google forms were used to collect the data. Also, if two separate assignments are incorporated—one for doing the review and another for the point averages, this involves an additional step to examine students' comments for quality.

CONCLUSION

Course design and pedagogy are iterative processes. As university faculty members strive to help students develop essential learning outcomes through the use of HIPs in order prepare them for the world of work, they invest extensive creativity in designing assignments that will motivate students, have face validity, and result in improved skill development and performance. Typically, these innovations require refinement as they are piloted, and results and student feedback are examined. The current study is no exception. Rather, it illustrates the importance of trial and error and weighing the advantages and disadvantages of various approaches to promoting content and skill development. In this case, the workload

was fairly extensive, and the benefits did not fully meet the goal for the assignment. With refinement, however, such as those indicated in the discussion, the range of scores and value of comments could be improved to be more helpful in terms of providing formative peer feedback.

REFERENCES

Alder, S., Campion, M., Colquitt, A., Grubb, A., Murphy, K., Colander-Krane, R., Pulakos, E.D. (2016). Getting rid of performance ratings: Genius or folly? A debate. *Society for Industrial and Organizational Psychology*, *9*(2), 219-252. DOI:10.1017/iop.2015.106

Andrade, M.S. (2019). Developing management skills – Team ePortfolios. *International Journal of Management and Business*, *10*(Special Edition), 104-119. http://iamb.org/journal-ijmb/journals/volume-10-s/

Andrade, M.S. (2020). *Organizational behavior in practice* (2nd ed.). Dubuque, IA: Great River Learning.

Andrade, M.S., Miller, R.M., & Ogden, M. (2020). Teamwork for business majors – Peer evaluation and high impact practices. *e-Journal of Business Education & Scholarship of Teaching*, *14*(2), 1-18.

Association of American Colleges and Universities. (2009). *Teamwork VALUE Rubric*. Retrieved from https://www.aacu.org/value/rubrics/teamwork

Association of American Colleges and Universities. (2011). *The LEAP vision for learning: Outcomes, practices, impact, and employers' views*. Washington, DC. Retrieved from https://www.aacu.org/sites/default/files/files/LEAP/leap_vision_summary.pdf

Bacon, D.R., Steward, K.A., & Anderson, E.S. (2001). Methods of assigning players to teams: A review and novel approach. *Simulation & Gaming*, *32*(1), 6-17.

Barry, L., Garr, S., & Liakopoulos, A. (2014, March 4). *Performance management is broken: Replace "rank and yank" with coaching and development*. Retrieved from https://dupress.deloitte.com/dup-us-en/focus/human-capital-trends/2014/hc-trends-2014-performancemanagement.html

Bernardin, J.H., & Buckley, R.M. (1981). Strategies in rater training. *Academy of Management Review*, *6*(2), 205-212.

Biggs, J.B., & Tang, C. (2011). *Teaching for quality learning at university* (94th ed.). Open University Press, Buckingham.

Bol, J.C. (2011). The determinants and performance effects of managers' performance evaluation biases. *The Accounting Review*, *86*(5), 1549-1575.

Bull Schaefer, R.A. (2018). Conducting midterm performance reviews: An exercise for teaching performance management. *Management Teaching Review*, *3*(1) 7-19. https://doi.org/10.1177/2379298117728023

Campbell, K.S. & Lam, C. (2019). Effect of leader rapport-management feedback on leader-member relationship quality and perceived group effectiveness in student Teams. *IEEE Transactions on Professional Communication*, *6*(23), 253-262. doi:10.1109/TPC.2019.2913238

CATME. (2020). *Welcome to CATME*. Retrieved from https://info.catme.org/

Chapman, K.J., Meuter, M., Toy, D., & Wright, L. (2006). Can't we pick out own groups? The influence of group selection method on group dynamics and outcomes. *Journal of Management Education*, *30*(4), 557-569.

Cheruvelil, K.S., De Palma-Dow, A., & Smith, K.A. (2020). Strategies to promote effective student research teams in undergraduate biology labs. *National Association of Biology Teachers*, *82*(1), 18-27.

Clark, R.J. (2013). Performance reviews: A saving grace or the devil. *Air Medical Journal*, *32*(3), 115-117. http://dx.doi.org/10.1016/j.amj.2013.02.005

CPA. (2012). *Professional accreditation guidelines for higher education programs*. The institute of chartered accountants in Australia and CPA Australia. Sydney.

Dusterhoff, C., Cunningham, J.B., MacGregor, J.N. (2012). The effects of performance rating, leader–member exchange, perceived utility, and organizational justice on performance appraisal satisfaction: Applying a moral judgment perspective. *Journal of Business Ethics*, *119*(2), 265-273. cdoi:10.1007/s10551-013-1634-1

Erez, A., LePine, J.A., & Elms, H. (2002). Effects of rotated leadership and peer evaluation on the functioning and effectiveness of self-managed teams: A quasi-experiment. *Personnel Psychology*, *55*(4), 929–248.

Fayol, H. (1916). *General and industrial management*. Institute of Electrical and Electronics Engineering.

Fellenz, M.R. (2006). Toward fairness in assessing student groupwork: A protocol for peer evaluation of individual contributions. *Journal of Management Education*, *30*(4), 570-591.

Fink, L.D. (n.d.). *Team-based learning: Two methods for calculating peer evaluation scores*. Retrieved from http://tblc.roundtablelive.org/Resources/Documents/TBL%20-%202%20methods_peer%20eval%20scores.pdf

Finlay, A., & Brown McNair, T. (2013). *Assessing underserved students' engagement in high-impact practices*. Washington, DC: Association of American Colleges and Universities. Retrieved from https://www.aacu.org/assessinghips/report

Fong, Y.F., & Li, J. (2016). Information revelation in relational contracts. *Review of Economic Studies*, *84*, 1-27. Retrieved from http://www.restud.com/wp-content/uploads/2016/06/MS14720manuscript.pdf

Hall, M., Ramsay, A., & Raven, J. (2004). Changing the learning environment to promote deep learning approaches in first year accounting students. *Accounting Education: An International Journal*, *13*(4), 489-505.

Hart Research Associates (2015, January). *Falling short? College learning and career success*. Washington, DC: Association of American Colleges and Universities. Retrieved from https://www.aacu.org/sites/default/files/files/LEAP/2015employerstudentsurvey.pdf

Holzbach, R.L. (1979). Moral hazard and observability. *The Bell Journal of Economics*, *10*(1), 74-91.

Hoogendoorn, S., Oosterbeek, H., & van Praag, M. (2013). The impact of gender diversity on the performance of business teams: Evidence from a field experiment. *Management Science*, *59*(7), 1514-1528. http://dx.doi.org/10.1287/mnsc.1120.1674

Jassawalla, A., Sashittal, H., & Malshe, A. (2009). Students' perceptions of social loafing: It's antecedents and consequences in undergraduate business classroom teams. *Academy of Management Learning and Education*, *8*(1), 42–54.

Katzenbach, J.R., & Smith, D.K. (1993, March/April). The discipline of teams. *Harvard Business Review*. Retrieved from https://hbr.org/1993/03/the-discipline-of-teams-2

Katzenbach, J.R., & Smith, D.K. (2015). *The wisdom of teams: Creating the high-performance organization*. Harvard Business Press

Kelley, C., Tong, P., & Choi, B.J. (2010). A review of assessment of student learning programs at AACSB schools: A dean's perspective. *Journal of Education for Business*, *85*(5), 299-306. doi: 10.1080/08832320903449519

Kruger, J., & Dunning, D. (1999). Unskilled and unaware of it: How difficulties in recognizing one's own incompetence lead to inflated self-assessments. *Journal of Personality and Social Psychology*, *77*(6), 1121–1134.

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. Retrieved from https://www.aacu.org/leap/hips

Kuh, G.D., & Kinzie, J. (2018, May 1). *What really makes a 'high-impact' practice high impact?* Inside HigherEd. Retrieved from https://www.insidehighered.com/views/2018/05/01/kuh-and-kinzie-respond-essay-questioning-high-impact-practices-opinion

Kuh, G.D., & O'Donnell, K. (2013). *Ensuring quality and taking high-impact practices to scale*. Washington, DC: Association of American Colleges and Universities Retrieved from

https://www.aacu.org/publications-research/publications/ensuring-quality-taking-high-impact-practices-scale for purchse
Kuh, G.D., O'Donnell, K., & Schneider, C.G. (2017). HIPs at ten. *Change: The Magazine of Higher Learning*, *49*(5), 8-16. doi: 10.1080/00091383.2017.1366805
Loughry, M.L., Ohland, M.W., & Moore, D.D. (2007). Development of a theory-based assessment of team member effectiveness. *Educational Psychological Measurement*, *67*(3), 505–524.
Martell, K. (2007). Assessing student learning: Are business schools making the grade? *Journal of Education for Business*, *82*(4), 189–195.
Mayo, M., Kakarika, M., Pastor, J.C., & Brutus, S. (2012). Aligning or inflating your leadership self-image? A longitudinal study of responses to peer feedback in MBA teams. *Academy of Management Learning & Education*, *11*(4), 631-652. http://dx.doi.org/10.5465/amle.2010.0069
McGregor, D.M. (1957). An uneasy look at performance appraisal. *Harvard Business Review*, *35*(3), 89-94.
Michaelsen, L.K., Knight, A.B., & Fink, L.D. (Eds.). (2004). *Teambased learning: A transformative use of small groups in college teaching*. Sterling, VA: Stylus Publishing.
Ohl, T., & Cates, W. (2006). The nature of groups: implications for learning design. *Journal of Interactive Learning Research*, *17*(1), 71-89.
Pfaff, E., & Huddleston, P. (2003). Does it matter if I hate teamwork? What impacts student attitudes toward teamwork. *Journal of Marketing Education*, *25*(1), 37–45.
Post, M.L., Barret, A., Williams, M., & Sharff, L. (2020). Impact of team formation method on student performance, attitudes, and behaviors. *Journal of the Scholarship of Teaching and Learning*, *20*(1), 1-21. Retrieved from https://files.eric.ed.gov/fulltext/EJ1254305.pdf
Prendergast, C. (1999). The provision of incentives in firms. *Journal of Economic Literature*, *37*(1), 7-63.
Qureishi, H. (2020). 360 degree performance effects on employee attitude, professional effectiveness and general work performance. *Research Review International Journal of Multidisciplinary*, *5*(4), 56-69.
Rhee, J., Parent, D., & Basu, A. (2013). The influence of personality and ability on undergraduate teamwork and team performance. *SpringerPlus*, *2*(16). Retrieved from https://doi.org/10.1186/2193-1801-2-16
Rhodes, T. (2009). *Assessing outcomes and improving achievement: Tips and tools for using rubrics*. Washington, DC: Association of American Colleges and Universities.
Rico, R., Sanchez-Manzanares, M., Gil, F., & Gibson, C. (2008). Team implicit coordination processes: A team knowledge-based approach. *Academy of Management Review*, *33*(1), 163–184. https://doi.org/10.5465/amr.2008.27751276
Rock, D., & Jones, B. (2015, September 8). *Why more and more companies are ditching performance ratings*. Retrieved from https://hbr.org/2015/09/why-more-and-more-companiesare-ditching-performance-ratings
Rogel, C. (2017). *8 benefits of 360 degree feedback*. Decision Wise. Retrieved from https://www.decision-wise.com/benefits-of-360-degree-feedback/
Schindler, F. (2013). Performance reviews. *IEEE Microwave Magazine*, *14*(2), 12-14. doi:10.1109/MMM.2012.2234355
Schultz, J.L., Wilson, J.R., & Hess, K.C. (2010). Team-based classroom pedagogy reframed: the student perspective. *American Journal of Business Education*, *3*(7), 17–24.
Scott-Ladd, B., & Chan, C.C.A. (2008). Using action research to teach students to manage team learning and improve teamwork satisfaction. *Active Learning in Higher Education*, *9*(3), 231-248.
Thomas, G., Martin, D., & Pleasants, K. (2011). Using self- and peer-assessment to enhance students' future-learning in higher education. *Journal of University Teaching & Learning Practice*, *8*(1). Retrieved from https://ro.uow.edu.au/jutlp/vol8/iss1/5
Volkov, A., & Volkov, M. (2015). Teamwork benefits in tertiary education. *Education + Training*, *57*(3), 262-278.

Wageman, R., & Gordon, F.M. (2005). As the twig is bent: How group values shape emergent task interdependence in groups. *Organization Science*, *16*(6), 687-722.
Walker, A. (2001). British psychology students' perceptions of group-work and peer assessment. *Psychology Learning and Teaching*, *1*(1), 28–36.
Watson, C.E., Kuh, G.D., Rhodes, T., Light, T.P., & Chen, H. L. (2016). Editorial: ePortfolios—The eleventh high impact practice. *International Journal of ePortfolio*, *6*(2), 65-69.
Wheeling, B.M., Miller, D.S., & Slocombe, T.E. (2015). Assessment at AACSB schools: A survey of deans. *Journal of Education for Business*, *90*(1), 44-49. DOI: 10.1080/08832323.2014.973824
Wilkie, D. (2015, August 19). *Is the annual performance review dead?* Retrieved from https://www.shrm.org/resourcesandtools/hr-topics/employee-relations/pages/performancereviews-are-dead.aspx