

Rubrics and Teamwork Development in Online Higher Education Business Courses: Exploring the Connection

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Abstract

Effective teamwork is important in higher education business courses to prepare students for future professional contexts. Learning outcomes resulting from teamwork include motivation, knowledge retention, deep learning, critical thinking, and professional competency development. Effective teams typically work toward a common goal. When teams know what that goal is, they can collaborate and share their skills to achieve it. Instructors can assist in this process by making assignment goals clear through the use of rubrics that outline assignment expectations and by providing feedback to help students achieve the goals. This study examined the use of teamwork and rubrics in three different undergraduate courses in a school of business in an open admission regional public university to determine if rubrics improved the effectiveness of student teams. Findings indicate that in the course sections where rubrics were not used, students perceived greater effectiveness in three of the eight areas examined—understanding roles, dividing the work, and contributing equally, suggesting that rubrics may not have the impact expected.

Keywords: teamwork, schools of business, rubrics, learning outcomes

Teamwork is a common pedagogical practice in higher education business courses. As an increasing number of courses are being redesigned for online delivery, consideration must be given to facilitating effective teamwork in a virtual environment. Business educators recognize that effective teamwork, and particularly the ability to work with individuals different from oneself, is critical to professional success. These boundary-crossing skills are, in fact, highly valued by employers (Hart Research Associates, 2015).

Other boundary-crossing skills, or those that apply across disciplines and are essential to success in today's rapidly changing world, include written communication, oral communication, critical thinking, and the application of knowledge (Association of American Colleges and Universities [AAC&U], 2011; Breslow, 2015; Hart Research Associates, 2015). As such, higher education faculty members, regardless of their fields of expertise, should strive to emphasize these and other boundary-crossing learning outcomes.

Teamwork, as well as collaborative assignments, are recognized as a high impact practice, designed to encourage active, engaged, and deep learning (Kuh et al., 2017). High impact practices are characterized by elements such as appropriately high expectations, an investment of time and effort, interaction with diverse others, constructive feedback, reflection on learning, application of knowledge, and demonstration of competence (Kuh & O'Donnell, 2013). In business education, the evidence of positive learning outcomes resulting from teamwork are well-documented and similar to those for high impact practices generally. They include motivation, knowledge retention, deep learning, critical thinking, and professional competency development (Biggs & Tang, 2011; Hall et al., 2004; Ohl & Cates, 2006; Scott-Ladd & Chan, 2008; Volkov & Volkov, 2015; Wageman & Gordon, 2005).

Providing students with frequent, timely, and constructive feedback (an element of high impact practices) on team assignments may involve the use of a rubric, commonly defined as a scoring guide used to identify performance expectations and establish evaluation criteria. Rubrics improve objectivity in scoring and help instructors identify students' competencies and deficiencies (Garfalo et al., 2016; Smith, 2008; Mora & Ochoa, 2010; Petropoulou et al., 2011). For students, they offer guidelines, clarify expectations, and indicate areas for improvement (Bolton, 2006; Gibson, 2011; Mora & Ochoa, 2010; Rau, 2009; Smith, 2008). Rubrics can help focus faculty-student conversations on learning rather than on grades (Garfalo et al., 2016; Walvoord & Anderson, 1998).

Although considerable research has been conducted on the importance of teamwork in higher education business courses and the efficacy of rubrics, studies have generally not explored how rubric use for team assignments impacts team performance or the effectiveness of rubrics in an online environment. The focus of this study is to learn more about the influence of rubrics on teamwork in online business courses based on the premise that rubric standards will encourage effective teamwork. Specifically, students will focus on achieving goals related to the expectations identified in the rubrics; this may enhance accountability, commitment, and strategy use, thereby improving team and task performance (Katzenbach & Smith, 1993, 2015; Robbins & Judge, 2017). Rubrics may also enhance students' ability to be effective in an online environment as they provide additional structure in the absence of face-to-face time with an instructor. The broader goal of the study is to identify effective pedagogical practices leading to the development of teamwork skills in business education to prepare students for workplace success.

Literature Review

Teamwork is associated with a number of positive outcomes in the workplace, and as such, is a highly desirable skill. The presence of teams and team-oriented behaviors enhances performance and goal achievement (Boyt et al., 2005; Cohen & Bailey, 1997; Katzenbach & Smith, 1993, 2015; Marks et al., 2001). Teamwork leads to increased work engagement, commitment, participation in decision making, and feelings of organizational ownership (Rahman et al., 2017). Additionally, high-performing teams, or those characterized by common goals, commitment, ownership, and respect (McDonough, 2000), are associated with innovation and responsiveness to changing markets (Johnsson, 2017).

Few tasks in the workplace are accomplished by a single individual (Galbraith & Webb, 2013). Due to the positive outcomes of teams and their prevalence in the workplace, experience with teamwork in higher education contexts is needed to prepare students for their careers. The use of virtual teams is also increasingly common in the workplace. As such, students need to learn skills for communicating and collaborating in these environments. Online courses that require teamwork can be excellent preparation for this. Next, we briefly review issues and opportunities related to teamwork in higher education business courses, consider relevant team effectiveness theory, examine research on rubrics and their potential impact on student team effectiveness, and provide background information on virtual teams.

Teamwork in Higher Education Business Courses

Students may have had negative experiences with teamwork prior to enrollment in their business courses (where teamwork tends to be emphasized) due to lack of preparation, insufficient skills, inadequate structure, and limited scaffolding. “Good practices in teamwork are not simply learned by being part of a team” (Zarraga-Rodriguez et al., 2015, p. 275). Students have most likely experienced group work, or the “collection of individuals with a task to be concluded without much defined structure” (Scott et al., 2012, p. 190), rather than teamwork. Consequently, they may have established mental models governing their expectations for teamwork behaviors (Zarraga-Rodriguez et al., 2015), which cause them to doubt their abilities, expect social loafing, worry about scheduling problems (Pfaff & Huddleson, 2003; Schultz et al., 2010), anticipate frustration and excess work, be concerned about grades, practice groupthink behaviors, or become dysfunctional due to a controlling team member (Galbraith & Webb, 2013).

Students may not understand the difference between groups and teams, and therefore, not recognize that teams must be actively structured and managed (Scott et al., 2012) and that teamwork requires the development of a specific skill set to achieve goals. Even in schools of business in higher education institutions, unstructured group projects rather than those involving coaching and leadership skill development may be common (Scott et al., 2012). To address these issues, instructors must help

students understand that groups are characterized by sharing information, individual accountability, and varied skills while teams emphasize collective performance, a common purpose and working approach, mutual accountability, and complementary skills (Katzenbach & Smith, 1993, 2015; Robbins & Judge, 2017).

A number of strategies can help students overcome concerns with teamwork. These include introducing relevant concepts, requiring team charters or agreements, goal-setting, reflections on team performance, and the use of peer review or performance ratings (Breslow, 1998, 2005; Mueller, 2012). Other effective strategies include having instructors monitor team performance and provide evaluation criteria or rubric-based feedback to guide students (Andrade, 2019; Robbins & Finley, 2000; Schermerhorn et al., 2008; Zarraga-Rodriguez et al., 2015). Explaining the rationale for team assignments, connecting teamwork to course objectives, assigning students to take specific roles, providing training, and using class time to address workload concerns have also been proven effective (Hansen, 2006; Pfaff & Huddleston, 2003; Schultz et al., 2010; Zarraga-Rodriguez et al., 2015).

Instructors can introduce the stages of team formation to help students recognize the recursive nature of forming, norming, storming, performing, and adjourning, and that these stages are a necessary and normal part of team development (Tuckman, 1965; Tuckman & Jensen, 1977). In particular, students must learn that conflict (e.g., storming) can be beneficial (Mueller, 2012). They should be aware that their performance may decline during the storming stage but will improve in the norming phase. This is referred to as a performance curve (Katzenbach & Smith, 1993, 2015). Teams can also be encouraged to revisit their charters or agreements to re-establish their purpose, roles, and agreed-upon norms.

Team Effectiveness

Familiarizing students with the elements of effective teamwork can improve performance (Gonzalez-Roma & Hernandez, 2014; Hackman, 2002; Peralta et al., 2015; Stewart & Barrick, 2000; Thompson, 2000). Although a number of team effectiveness models have been proposed (e.g., the GRPI model; Rubin et al., 1977; the T7 model; Lombardo & Eichinger, 1995; the Five Dynamics of Team Work and Collaboration; LaFasto & Larson, 2001; the Hackman Model of Team Effectiveness; Hackman, 2002; the Five Dysfunctions of a Team model; Lencioni, 2005), the Katzenbach and Smith model (1993, 2005) is most relevant as a lens for understanding the potential impact of rubrics on team performance.

Katzenbach and Smith's (1993, 2005) model emphasizes three deliverables—collective work products, performance results, and personal growth. To achieve these, certain behaviors must be present. These are presented in three categories. The first is commitment, evidenced by a meaningful purpose, common approach, and specific goals. The next is skills, specifically the problem-solving, technical, and interpersonal skills of team members. The third component is accountability, consisting of mutual

accountability, individual accountability, and team size. As such, teams are defined as “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” (Katzenbach & Smith, 1993, para. 11).

Further, teams should consider the following questions – “Is the size of the team appropriate? Do members have sufficient complementary skills? Is the purpose of the team truly meaningful and understood? Are there team-oriented goals – are they clear, realistic, and measurable? Does the team have a well thought-out, articulated working approach? Is there a sense of mutual accountability?” (De Meuse, 2009, p. 8). In the context of student teams, these questions are useful to both instructors and students.

The Role of Rubrics

As established in the introduction, rubrics, or scoring guides that identify assignment expectations and assessment standards, have proven effective in higher education contexts. Benefits include helping instructors score student work consistently and objectively and identify strengths and weaknesses in students’ learning and skills (Garfalo et al., 2016; Mora & Ochoa, 2010; Petropoulou et al., 2011; Smith, 2008;). Rubrics help students understand what instructors are looking for, and after assessment occurs, where they lost points and what they can do to improve (Bolton, 2006; Gibson, 2011; Mora & Ochoa, 2010; Rau, 2009; Smith, 2008). Ideally, rubrics should be discussed with students and connected to course objectives (Gibson, 2011; Rau, 2009). Student input should be sought in developing and refining rubrics so that they are clearly understood and valued (Rau, 2009). Rubrics help both faculty and departments identify needed changes in course or program-wide curricula to address learning gaps (Bennett et al., 2017; Calma, 2013; Mora & Ochoa, 2010; Rau, 2009). Challenges associated with rubric use include the time needed to create and refine them, rubric quality, and rater training and experience (Bennett et al., 2017; Garfalo et al., 2016; Mok & Toh, 2015).

The use of rubrics for team assignments in online courses is potentially related to the behaviors identified in Katzenbach and Smith’s (1993, 2005) team effectiveness framework in order to achieve the outcomes of collective assignment completion, academic performance, and personal growth. The commitment element entails students understanding the *purpose* of the assignment (which could be indicated in a rubric), determining a *common approach* for working together (processes, norms, and expectations indicated in a team charter, for example), and setting *goals* (based on expectations in the rubric and as the result of rubric-based feedback).

Rubrics are relevant to the accountability aspect of the model as teams establish *individual* and *mutual accountability* for work quality and quantity; they may have individual and team responsibilities, and

assign, perform, and rotate team roles which involve different tasks. Rules of conduct can be established to support accountability. These could be related to meeting attendance, communication methods, discussion protocols, expectations for equal contributions, and deadlines. Feedback from a rubric can inform students of areas for improvement on these elements as well.

Finally, various skills are critical to success on team assignments. Teamwork helps students recognize and appreciate the different abilities and perspectives that team members contribute to a task. These may include *technical skills* that could be noted on a rubric such as formatting, the use of graphics, data analysis, or writing and editing. Students improve their *interpersonal skills* as they communicate and *solve problems* together. Rubric-based feedback helps them note where improvements are needed related to these skills so that they can further problem-solve to make improvements.

The current study explores the degree to which rubric-based feedback helps teams in higher education business courses achieve learning outcomes. The feedback can indicate areas for improvement. This encourages students to set goals, establish effective processes, take responsibility, work interdependently, collectively utilize their skills, solve problems together, and develop interpersonal skills. The desired result is building commitment to each other and the task, and ultimately, producing quality work while developing personally and professionally. Studies exploring how teamwork might be enhanced using rubrics, and particularly in an online environment, is a current research gap.

Virtual Teams

Virtual teams are increasingly common in global business contexts. Disadvantages traditionally identified in the workplace include a lack of contextual clues, such as tone of voice, posture, facial clues, and eye contact, as well as timing of responses (Driskell et al., 2003), decreased group cohesiveness (Straus, 1997; Warkentin et al., 1997), difficulty with team development and establishing relationships (Driskell et al., 2003), and increased pressure to conform (Mullen et al., 1989). These factors are impacted by the type of team, team tasks and goals, and the type of technology used to connect members. Video conferencing, commonly used today, can address many former limitations by allowing team members to connect with high quality audio and video, interact face-to-face, share and discuss documents in real-time, and build relationships.

Student teams operating in an online environment have expressed concerns with communication difficulties due to the inability to detect facial and verbal nuances when video conferencing was absent; however, they demonstrated similar outcomes in terms of leadership, task commitment, and task ownership as face-to-face teams (Saghafian & O'Neill, 2017). Social interaction in online courses creates community and increases retention in some contexts (Williams et al., 2006); teamwork has the potential

to do the same. Interestingly, however, only 28% of chief online officers surveyed indicated that group projects were required or very common in online courses (Garrett & Legon, 2019).

Online enrollments in U.S. higher education institutions are increasing with nearly 32% of students taking one or more distance courses; however, 50% of these enrollments are concentrated in only 5% of institutions (Seaman et al., 2018). Although higher education faculty are often concerned with the workload associated with developing and teaching online courses (Hew & Cheung, 2014; Santilli & Beck, 2005; Tomei, 2006) and with their quality (Ciabocchi et al., 2016), online courses have been demonstrated to be effective in terms of collaborative learning and learning gains (Redpath, 2012). As such, “attitudinal biases that assume face-to-face interaction and the physical presence of the instructor necessarily constitute a superior method of delivery are simply no longer valid” (Redpath, 2012, p. 136). In fact, according to chief online officers in American higher education institutions, in 81% of regional, public, 4-year institutions, online student performance is comparable to that of face-to-face students; only in two-year colleges did online students fare worse than their on-ground counterparts (Seaman et al., 2018).

Methods

The study involved students enrolled in online courses in three business school disciplines—marketing, organizational behavior, and legal studies. The students were undergraduate business majors in their third or fourth year of study in their respective bachelor degree programs. The university at which the study occurred is a large, regional university in the United States with undergraduate and limited master’s degree programs. It is open admission although students majoring in business must meet certain grade requirements in prerequisite courses in order to pursue studies in the school of business.

Three instructors participated in the study. Each taught two sections of an online courses in marketing, organizational behavior, and legal studies. Each instructor implemented two online teamwork assignments in both sections of their courses. Section 1 of each class was designated as the control section and Section 2 as the experimental section. In the control section, the instructors provided basic instructions for the team assignments. In the experimental section, they provided basic instructions as well as rubrics. Different rubrics were used in the courses as appropriate for the respective assignments and focused on assignment expectations. (See Appendix B for examples.) Given the advantages of rubrics as evidenced by the literature review and the need to provide students with effective structure to be successful in an online environment, the expectation was that the use of rubrics would result in the development of teamwork skills.

The instructors divided the students into teams of 5-7 persons in their respective courses. The impact and efficacy of team dynamics for online teams was evaluated through an online survey distributed to students in both the control and the experimental groups through Canvas, the university’s learning management system. See Appendix A for the survey instrument. Students were recruited through instructor emails and course announcements and gave their consent. The study and the survey were approved by the university’s institutional research board. The study was set up as follows with no rubric being used in the control group. Students took the survey after completing each of the assignments. The

control group consisted of 155 participants and the experimental group had 191 although not every participant answered every question.

- Team Learning Survey 1 Section X01 No Rubric (control group)
- Team Learning Survey 1 Section X02 Rubric (experimental group)
- Team Learning Survey 2 Section X01 Rubric (experimental group)
- Team Learning Survey 2 Section X02 No Rubric (control group)

Data Collection and Analysis

Survey data were collected from January–April, 2020. The survey questions utilized a 5-point Likert scale with a score of 1 indicating strongly disagree and a score of 5 indicating strongly agree. The purpose of the survey was to measure the impact of rubrics on team dynamics. Items were created to reflect the Katzenbach and Smith model (1993), which entails three categories of behaviors—skills, accountability, and commitment—in order to achieve the following deliverables: collective work products, performance results, and personal growth. See Table 1 for an explanation of how the survey statements reflected the components of the model.

Table 1
Question Map

Explanation	Survey Statements
<i>Commitment</i> behaviors such as having a meaningful purpose, understanding assignment goals, and having a common working approach (e.g., dividing the work) is thought to impact the deliverables of collective work products and personal growth.	Our team members had a shared purpose. (commitment - purpose) Our team members understood the goals of the assignment. (commitment - goals) Our team members divided the work for the assignment. (commitment - approach) Our team members were passionate about the assignments. (accountability and commitment)
<i>Accountability</i> behaviors such as mutual and collective responsibility (e.g., individual roles and equal contributions) and appropriate team size (set by the instructors) is theorized to impact performance results and personal growth.	The associated survey questions were as follows: Our team members understood their roles on the team. (accountability - individual) Our team members contributed equally to the assignment. (accountability - collective) Our team members were passionate about the assignments. (accountability and commitment)
<i>Skills</i> such as technology and interpersonal skills (e.g., having fun) are theorized to impact collective work products and performance results.	The associated survey questions were as follows: Our team members had the technical skills to complete the assignment. (technical/functional skills) Our team had fun. (interpersonal skills)

It should be noted that in this study, the Katzenbach and Smith (1993) deliverables were not measured. The framework guided the development of the survey in order to determine if rubrics encouraged student teams to develop effective teamwork behaviors. The survey also included two demographic questions (gender, age). The average age of participants overall was 24. The oldest was 51 years old and the youngest was 17; 53% were female and 43% were male, with the remaining participants preferring not to indicate gender.

Results

Descriptive results were run to identify any differences between the control and experimental groups. Results are indicated in Table 2. The control group showed higher ratings on all eight items. Further statistical analyses were performed with the results shown in in Table 3 and Figures 1-3.

Table 2
Group Descriptive Statistics

	Group	N	Mean	Median	SD	SE
Understood roles	Control	151	2.01	2.00	1.105	0.0899
	Exp	191	1.73	2.00	0.933	0.0675
Divided the work	Control	146	1.81	1.00	1.141	0.0944
	Exp	189	1.56	1.00	0.883	0.0642
Contributed equally	Control	146	2.23	2.00	1.329	0.1100
	Exp	189	1.90	2.00	1.121	0.0815
Understood goals	Control	145	1.90	2.00	1.132	0.0940
	Exp	189	1.73	1.00	1.040	0.0756
Shared purpose	Control	144	1.77	1.00	1.015	0.0846
	Exp	188	1.68	1.00	0.950	0.0693
Technical skills	Control	145	1.56	1.00	0.927	0.0770
	Exp	188	1.45	1.00	0.822	0.0600
Passionate about assignment	Control	144	2.44	2.00	1.199	0.0999
	Exp	188	2.32	2.00	1.221	0.0891
Had fun	Control	144	2.60	3.00	1.142	0.0952
	Exp	188	2.42	2.00	1.201	0.0876

Welch's t-tests, which do not assume equal variances (e.g., see Ruxton, 2006), were run to compare the control and experimental conditions for the eight questions (see Appendix A). To control for multiple t-tests, the correction advised by Benjamini and Hochberg (1995) is used. The results are in Table 3, where both the original (p) and the corrected p -values p_{BH} are shown.

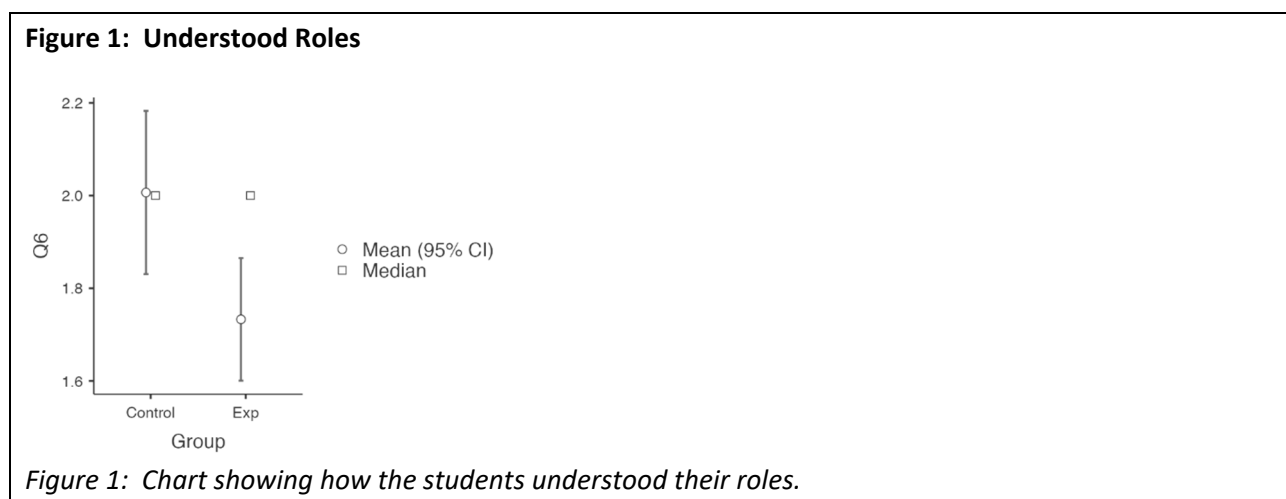
Table 3
Independent Samples T-Test

		Statistic	df	p/p _{BH}	Mean difference	SE difference	Effect Size
Understood roles	Welch's t	2.434	293	0.016/0.034*	0.2736	0.1124	Cohen's d 0.2677
Divided the work	Welch's t	2.167	266	0.031/0.041*	0.2474	0.1142	Cohen's d 0.2425
Contributed equally	Welch's t	2.396	282	0.017/0.034*	0.3281	0.1369	Cohen's d 0.2669
Understood the goals	Welch's t	1.436	296	0.152/0.275	0.1733	0.1207	Cohen's d 0.1594
Shared purpose	Welch's t	0.823	297	0.411/0.411	0.0900	0.1094	Cohen's d 0.0915
Technical skills	Welch's t	1.146	290	0.253/0.337	0.1118	0.0976	Cohen's d 0.1276
Passionate	Welch's t	0.884	311	0.377/0.411	0.1184	0.1338	Cohen's d 0.0978
Had fun	Welch's t	1.368	315	0.172/0.275	0.1770	0.1294	Cohen's d 0.1510

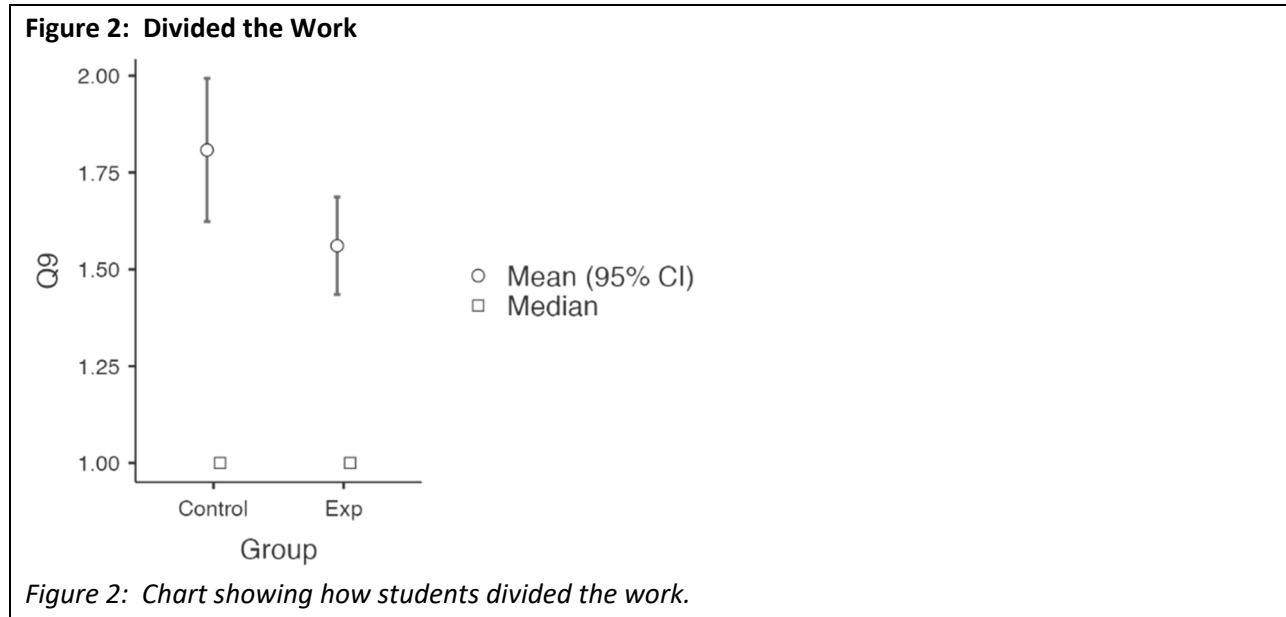
*one-tailed

Results indicate that three items (team members understood their roles on the team, divided the work for the assignment, and contributed equally to the assignment) were statistically different when comparing the control and experimental conditions, with all other comparisons being nonsignificant. These results are further clarified in Figures 1-3.

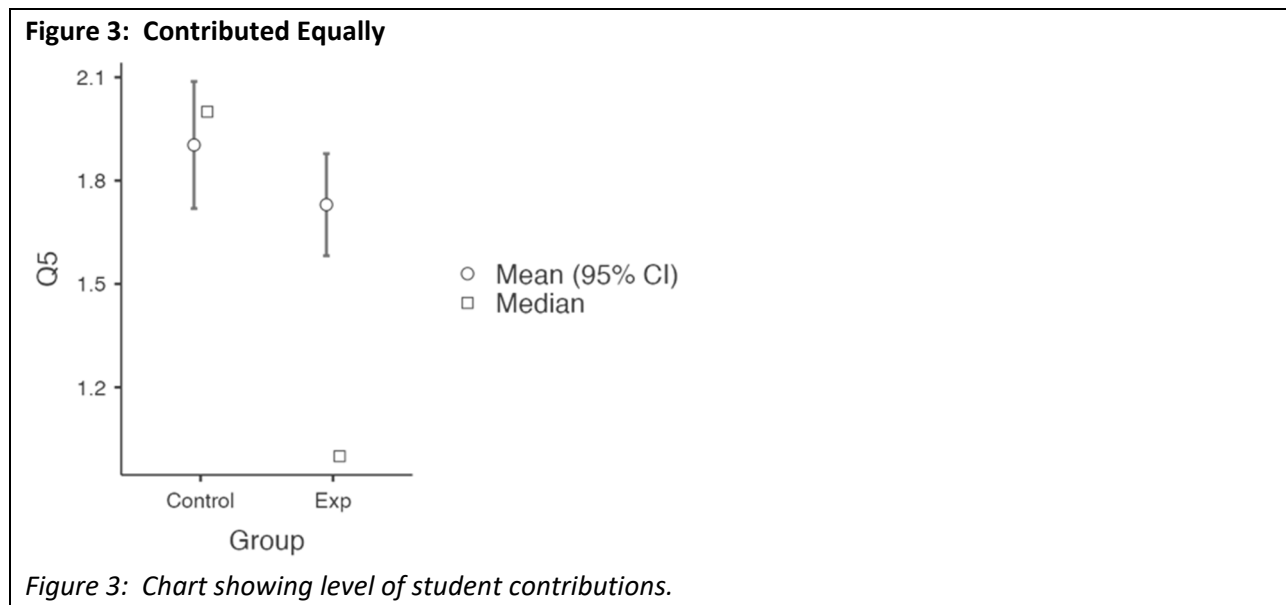
For the question examining if team members in either group better understood their roles, the control group (no rubric) indicated higher ratings. See Figure 1.



For the question on dividing the work, the control group (no rubric) indicated higher ratings on being effective at dividing their work. See Figure 2.



For the question on contributing equally, the control group (no rubric) indicated slightly higher ratings on contributing equally. See Figure 3.



Discussion and Implications

The results indicate that students in the control group (no rubrics) perceived themselves as better able to understand their roles. They also reported being more skilled at dividing the work and contributing equally to the tasks than students who received guidance and feedback by means of a rubric. The findings indicate that overall, the use of rubrics did not improve the development of teamwork skills as expected. These results were similar across all courses, which represented different disciplines and different rubrics. The study did not examine if the instructors evaluated students' teamwork skills or if they observed any performance differences in the two groups of students.

Perhaps one explanation for the findings is that the rubrics were focused on assignment expectations rather than expectations for teamwork and students did not see a connection between the two. Another explanation may be that since the control group teams did not have a rubric to lean on, they developed their own understanding of what they perceived as the best approach to assignments and proceeded forward. In this way, they demonstrated the ability to work independently and, also perhaps, a better understanding of what is entailed in effective teamwork than the teams that had rubrics on which to rely.

Rubrics were expected to positively impact the *commitment* behaviors of teams, as described in Katzenbach and Smith's (1993) model, such as having a meaningful purpose, understanding assignment goals, and having a common working approach (see Table 1). However, the teams that did not have rubrics for their assignments reported more success in determining an effective working approach (roles, division of work, equal contributions) than did their counterparts. This finding is in contrast to previous research demonstrating the efficacy of rubrics in helping learners clarify expectations (e.g., goals) and learn from feedback (Bolton, 2006; Gibson, 2011; Mora & Ochoa, 2010; Rau, 2009; Smith, 2008).

The *accountability* behaviors of teamwork (e.g., individual roles, equal contributions, and appropriate team size; see Table 1) were also expected to be positively impacted by rubric use in keeping with research, indicating that rubrics help students identify competencies and deficiencies (Garfolo et al., 2016; Mora & Ochoa, 2010; Petropoulou et al., 2011; Smith, 2008). However, the teams in the course sections that were not given a rubric perceived that they were better able to connect with each other, determine what needed to be done and how to do it, and commit themselves better to their tasks than those guided by a rubric. This suggests that factors other than rubrics impacted teamwork effectiveness, and perhaps that not having a rubric contributed to the need for students to take more responsibility on their own and be creative in how they approached tasks.

The *skills* component in the model (e.g., technology, interpersonal skills; see Table 1) reflects the assumption that teams will be strategically formed so that they possess the needed skills and diversity of perspectives to accomplish the assigned work. In other words, this aspect of the model is based on the premise that team members will possess appropriate skills and talents and a willingness and commitment to contribute. This impacts the work product. However, randomly assigned virtual teams may be less likely to possess all the skills needed to complete assignments effectively and team members may choose to not focus on the standards provided (e.g. rubric) to guide their work. In spite of this, however, teams in

the control group reported that they were able to identify the roles needed to carry out their tasks and contribute equally to their work products.

A broader goal of the study was to identify effective pedagogical practices leading to the development of teamwork skills in business education to prepare students for workplace success. The findings suggested that educators should carefully consider the purpose of rubrics and not simply assume that they will clarify goals and enhance learning. They also illustrated that assignment instructions were just as effective, and even more effective in several instances, according to the descriptive statistics, than instructions combined with rubrics in encouraging the development of desired teamwork skills. Teams that did not have the guidance of a rubric were, based on self-reports, more effective in establishing roles, distributing work, and contributing equally than those with rubrics. Not having a rubric perhaps encouraged team independence, problem-solving, and conscientiousness.

Future research needs to explore if and how assignment rubrics, which are typically used to identify goals and expectations and provide formative feedback, impact teamwork skill development. Although one would assume that feedback by means of a rubric would encourage both individual learners and teams to monitor their performance and make needed adjustments in their processes, this did not appear to be the case in this study. Teams in the experimental group were neither asked about the extent to which they used the rubrics provided or found them helpful, nor did the study examine learning outcomes or the quality of the work produced by either group. It also did not examine the type or extent of feedback the instructors provided. These are limitations that should be addressed in future research. Future research might also examine instructor perspectives on students' teamwork skills and grade or score comparisons on assignments with and without rubrics.

Conclusion

This study explored how rubric use for team assignments in three university level business education courses impacted team performance. It also addressed the effectiveness of teamwork and rubrics in an online environment. Rubrics were expected to guide virtual student teams and encourage them to develop commitment, accountability, and skill behaviors (Katzenbach & Smith, 1993, 2015). However, outcomes of this study suggest that assignment instructions may be sufficient to guide students, and that not using rubrics may encourage self-governing behaviors.

The findings did not support the value of rubrics as previously established although no prior studies have explored possible links between rubrics and their impact on teamwork skill development. As such, instructors should not assume that rubrics that set expectations for assignments and provide feedback on students' work will provide the needed guidance for improvement, particularly to team practices. Although rubrics have been used extensively in both face-to-face and online delivery modalities in university level business education courses, additional factors need to be examined to account for how students develop teamwork skills in virtual learning environments and how educators can effectively

encourage this development. These might include variables such as training, team size, communication, team charter effectiveness, or even personal factors impacting team member commitment.

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