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Understanding Student Perceptions of Teamwork

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Understanding student perceptions of the elements that affect positive team experiences helps inform faculty about their use of teams in the classroom. Using Q Methodology (Stephenson, 1935), students evaluated a large set of teamwork elements. The results indicate both areas of student agreement as well as significant differences in perceptions of elements that affect positive team experiences.

Introduction

Student learning can be significantly enhanced when students work in teams. Students' past team experiences and differing faculty interpretations of what constitutes a team and teamwork can contribute to strong biases related to teamwork. The purpose of this research is to help faculty understand students' perceptions of teamwork and to use the information to inform their own classroom preparation as they introduce the use of teams. Therefore, the researchers sought to understand the student perspective: Which elements of teamwork do students consider important to positive team experiences in the classroom?

Literature Review

The vast literature on teams directs instructors on how to use teams effectively in the classroom. The literature includes analyses of attitudes, fairness, slacking, social loafing, procedural justice, the use of peer evaluations and students' "voices" in evaluating team behavior, forming teams,

guiding teams, ensuring contribution, assigning team members, and grading procedures. Nearly all authors agree that allocating class time for team projects eliminates some undesirable team behaviors (Feichtner & Davis, 1984; Pfaff & Huddleston, 2003; Siciliano, 1999). Debate surrounds the question of whether teams should receive training in the classroom (Barker & Franzak, 1997; Bolton, 1999; Chen, Donahue, & Klimoski, 2004; Goltz, Hietapelto, Reinsch, & Tyrell, 2008; Hirschfeld, Jordan, Feild, Giles, & Armenakis, 2006; Scott-Ladd & Chan, 2008).

There is also disagreement about how teams should be formed (Lau & Murninghan, 2005; Pearce & Herbik, 2004; Rentsch & Klimoski, 2001). Whether teams are formed by the instructor or are student-assigned, the array of team formation strategies include homogenous or heterogeneous composition, simple random or stratified random assignment (Hilton & Phillips, 2008), and, recently, an innovative approach involving genetic algorithms (Moreno, Ovalle, & Vacari, 2012). Disagreement exists as to whether teams should be perpetual or changed frequently throughout the course term (Johnson, Johnson, & Smith, 2014; Michaelsen, Sweet, & Parmalee, 2008).

Considerable research exists on the differences and similarities between various pedagogical schools of thought with regard to the use of teams (see, for example, the special issue of the *Journal on Excellence in College Teaching* on "Small-Group Learning in Higher Education: Cooperative, Collaborative, Problem-Based, and Team-Based Learning" [vol. 25, nos. 3&4, 2014]). The literature does not address the student perspective on a set of elements relative to each other with regard to their perceived importance to positive team experiences in the classroom. In particular, there does not appear to be any research that aligns the ranking of the elements and the results to a specific pedagogical theory for group work.

Q Methodology

This research seeks to understand student perceptions of elements that affect positive team experiences in the classroom, specifically, those that can be controlled or influenced by faculty. The authors chose Q Methodology, often described as mixed method, which allows for the consideration of subjective viewpoints with a more quantitative factor analysis (Newman & Ramlo, 2010). For example, Nicholas and Trost (2015) used Q Methodology to assess students' viewpoints on changes in STEM class delivery modes. Originally developed by Stephenson (1935), Q Methodology is used in this research as presented and interpreted by Stephenson (1977, 1935, 1953), Brown (1980, 1986), and McKeown and Thomas (1988, 2013).

This methodology allows for the analysis of subjective perceptions of the most and least important elements in a set of items under consideration (McKeown & Thomas, 1988). Sources for Q Methodology include, for example, books by Brown (1980) and McKeown and Thomas (1988, 2013); the journal *Operant Subjectivity;* QMethod.org, a website for Q Methodology research; the annual Q Methodology conference, and software such as PCQ Method (http://schmolck.userweb.mwn.de/qmethod/). Mathematically, Q Methodology is not significantly different from factor analysis; the difference is what is measured.

Factor analysis is defined as follows:

> A method of expressing data linearly in terms of factors that are of special relevance so far as the construction of appropriate models is concerned. For example, the scores of *n* individuals obtained on *K* tests may be related linearly to such relevant factors as arithmetic or verbal facility. (Freund & Williams, 1966, p. 38)

In Q Methodology, on the other hand, a factor analysis is also conducted. However, in Q Method the data for the factor analysis are statements which are sorted or ranked by the respondent in a modified rank-ordering procedure. These statements are the Q sample. Then,

> respondents are asked to model their opinions with these items in a modified rank-ordering procedure in which they produce a *Q Sort*. . . .
>
> The *N* Q sorts are correlated, one with another, producing an *N x N* correlation matrix. . . . The final set of factors, the number and nature of which could hardly be anticipated on hypothetico-deductive grounds, are thus "generalizations" in both statistical and subjective respects. Finally, to probe more fully the character of these viewpoints, a set of factor scores is computed for each, thereby producing a "composite Q sort." One for each factor. (McKeown & Thomas, 2013, pp. 3-4).

Q Methodology is unique in its ability to require the user to rank the elements (the Q sample, shown in Appendix A) in terms of both their own importance and their importance with respect to other elements. Furthermore, Q Methodology requires only enough subjects to establish the existence of a factor (Benedict, 1946; Brown, 1980). The method and Q sample (statements) do not require a pre-test or validation (McKeown & Thomas, 2013).

The Statements

A discursive approach was used in a prior semester to find themes from student self-reflections after completion of a major team project. These themes were then turned into the 29 statements for the Q sample. This practice is in keeping with McKeown and Thomas (2013) and is a structured method for creating a hybrid Q sample. Each statement was then linked to the team-based learning (TBL) literature (Michaelsen, Knight, & Fink, 2004). While this particular research is not a study of TBL, the authors found it useful to tie the Q sample to one pedagogical theory in a grounded and cohesive manner, rather than drawing connections to several different theories.

The purpose of this research is not to convince readers of the merits of various instructional strategies. It is not an analysis of TBL versus cooperative learning (CL) or other pedagogies. The aforementioned issue of the *Journal on Excellence in College Teaching*, especially Michaelsen, Davidson, and Major (2014), provides a comprehensive review and comparison of TBL, CL, and problem-based learning (PBL).

Appendix B shows each statement and its relationship to the TBL literature. Each statement was identified as being either in agreement with TBL (pro-TBL), in disagreement with TBL (anti-TBL), or neutral relative to TBL. The statements were also identified as belonging to one of three types: those related to forming teams (T); those related to teaching, grading, and assignments (G); and other statements, such as those about team processes, the classroom space, member roles, and contributions (O). Finally, the Q statements were categorized at the micro level as either team processes, forming of teams, the classroom space, member roles, contribution, assignments, teaching, and/or grading, as shown in Table 1 and Appendix B.

Because not all faculty subscribe to the TBL instructional strategy, a relevant comparison, such as the one by Michaelsen et al. (2004) or by Davidson, Major, and Michaelsen (2014) summarize differences and similarities between TBL and cooperative learning.

Data Collection

Both authors are employed as faculty in a department of management within a business school. Both teach courses that are required for all Bachelor of Science in Business Administration (BSBA) majors. During the period in which the data were collected, the first author taught two sections each semester of a junior level supply chain and operations

Table 1
Summary of Q Sample Categories and TBL Stances

		Macro Category			*Micro Category*							
TBL Stance	*Overall*	**G**	**T**	**O**	**Team Process**	**Forming Teams**	**Class-room**	**Member Roles**	**Member Contri-bution**	**Assign-ments**	**Teaching**	**Grading**
Pro	13	7	2	4	1	2	2	0	0	7	2	2
Anti	14	1	8	5	6	6	0	2	4	1	1	0
Neutral	2	2	0	0	0	0	0	0	1	1	0	1

management course (SCOM), and the second author taught three sections of a junior-level business communication course (BC). The consent, instruments, and methodology were approved by the authors' institutional human subjects review board. Data collection in all five of the sections occurred during the first week of classes. The survey and Q sort took approximately 30 minutes to complete. The 99 male and 68 female subjects were all enrolled in courses taught by the authors. Students who were enrolled in the courses of both instructors completed the Q sort only once.

The instrument consisted of a short demographic survey (see Appendix C), a Q sort (Appendix D), and directions accompanied by 29 small cards each printed with one Q statement (see Appendix A). Subjects were instructed in accordance with "a condition of instruction" as described in McKeown and Thomas (2013) (see Appendix D).

Analysis

The Q sort data along with the subject number were entered into a downloaded version of PQ Method Release 2.35 (available from http://schmolck.userweb.mwn.de/qmethod/). After the data were entered, a principal component factor analysis (QPCA command) was conducted, and a varimax rotation (QVARIMAX) was then conducted. The first 8 factors were used (the maximum number of factors allowable by this version of Q Method software). The eignevalues for the 8 factors are shown in Table 2.

In addition to demographic questions, students were asked whether they had completed a particular 12-credit integrative TBL course block. The authors thought this might be relevant to the students' perceptions of teams because of the strong use of TBL in the block. Of interest is that almost 73% of the subjects on Factor 1 had completed this particular block. Table 3 shows the number of subjects on each factor and several demographics, including whether the 12-credit block was completed.

Eight factors were found using varimax rotation. Table 4 shows the ranking of each statement for each factor. For example, statement 1 for Factor 1 received a rank of 4 (the most important element). Additionally any distinguishing statements are denoted with bold font and underlined for each factor in Table 4.

Analysis of Factor Commonalities

The authors embarked on a study to understand the student perspective on which elements of teamwork are important to positive team

Table 2
Eigenvalues for Factors 1-8

Factor	*Eigenvalues*	*As Percentages*	*Cumulative Percentages*
1	49.0799	29.3891	29.3891
2	10.2041	6.1103	35.4994
3	9.2464	5.5368	41.0362
4	8.3531	5.0019	46.0380
5	7.7784	4.6577	50.6958
6	7.2531	4.3432	55.0390
7	6.4194	3.8439	58.0829
8	5.9273	3.5493	62.4322

experiences in the classroom. Analyzing factors using Q Methodology involves the contextuality principle, as explained by Lasswell (1948). The researcher focuses on the patterns of meaning within the context of the factor array and, as appropriate, to the relevance of patterns presented in particular theories (McKeown & Thomas, 2013). Commonalities across most or all of the factors will be examined; then, each of the eight factors will be considered.

Overall, reasonable agreement was present for 9 of the 29 statements. Understanding the commonalities can help faculty discern students' common positive and negative perceptions about working in teams. This knowledge can also assist faculty in anticipating students' apprehensions about team learning as well as help them understand why faculty choose particular team pedagogical practices.

(T) Forming Teams

One consideration in using teams is the means by which teams are formed. The majority of the factors loaded negatively on statements 4, 27, 28, and 29, which means that the factors do not believe that those practices create positive team experiences in the classroom. Students understand that faculty should form permanent teams, which are not based on personality or familiarity, for the duration of the course.

Table 3
Demographics of Subjects on Factors 1-8

Factor No.	*No. of Subjects on Factor*	*Average Age*	*Age Range*	*Female*	*Male*	*No. Took 12-Credit Block*	*% Took 12-Credit Block*
1	11	26.27	21-41	2	9	8	72.73%
2	9	22.00	19-27	4	5	3	33.33%
3	9	22.89	20-31	3	6	4	44.44%
4	13	21.38	20-25	6	6	3	23.07%
5	11	23.45	20-37	4	7	3	27.27%
6	5	21.40	20-25	2	3	2	40.00%
7	2	21.00	21-21	0	2	1	50.00%
8	5	21.40	21-22	1	4	2	40.00%

Table 4
Factor Ranking of Statements for Factors 1-8

Statement	*Factor 1*	*Factor 2*	*Factor 3*	*Factor 4*	*Factor 5*	*Factor 6*	*Factor 7*	*Factor 8*
1	**4**	-2	-1	-1	1	**-4**	2	-3
2	-1	-2	-2	1	-3	0	**3**	-1
3	1	0	1	-1	-1	0	**-4**	2
4	-3	-3	**1**	-3	-2	-2	-3	-3
5	0	**-2**	0	-2	0	2	-1	1
6	1	-1	2	2	-1	4	-2	0
7	-1	0	**3**	0	1	-2	2	-1
8	2	-1	1	2	**-4**	-1	0	-1
9	**3**	1	**4**	1	2	1	-1	1

Table 4 (*continued*)
Factor Ranking of Statements for Factors 1-8

Statement	*Factor 1*	*Factor 2*	*Factor 3*	*Factor 4*	*Factor 5*	*Factor 6*	*Factor 7*	*Factor 8*
10	2	3	3	**4**	2	2	1	2
11	0	0	**2**	3	3	0	-1	2
12	-2	-3	-1	1	0	-1	1	0
13	2	3	2	0	2	2	1	3
14	0	0	0	0	1	1	0	**2**
15	1	1	0	1	1	2	1	**-1**
16	-1	-2	0	-1	-2	1	**3**	1
17	3	2	1	0	4	3	2	**-2**
18	-1	0	1	0	1	-1	-2	**3**
19	0	1	-4	2	0	-3	-2	-2

20	1	-1	-1	-2	-1	-1	0	0
21	2	2	0	-1	2	1	-1	0
22	1	2	**-3**	1	0	0	-1	0
23	-2	2	-1	3	3	3	0	**-4**
24	-2	1	-2	2	0	0	2	1
25	0	1	**-2**	-1	-1	1	1	**4**
26	**-2**	**4**	**2**	-2	-2	-2	**0**	-1
27	-4	-4	-3	-4	-2	-3	**4**	-2
28	-1	-1	-1	-3	-1	-2	-3	-2
29	-3	-1	-2	-2	-3	-1	-2	1

(G) Teaching, Grading and Assignments

Assignments are also an important consideration for team effectiveness. As Michaelsen et al. (2004) describe it,

> The most fundamental aspect of designing effective team assignments is ensuring that they truly require group interaction. In most cases, team assignments will generate a high level of interaction if they require teams to use course concepts to make decisions that involve a complex set of issues, and enable teams to report their decisions in a simple form. (p. 33)

As reported by the large agreement among the factors, students seem to understand the relationship between the type of assignment (that is, the task) and the effectiveness of the team. All factors except Factor 8 recognize the importance of assignments as they relate to team learning, interaction, and development. Specifically statements 15 and 17 were ranked positively by six of the eight factors, while one factor ranked these in the neutral (0) position. Interestingly, the other 5 pro-TBL assignment-related statements were not ranked similarly by the factors. This indicates that faculty need to offer students better explanations of why their assignments contribute to team effectiveness.

(O) Other: Team Processes, Classroom Space, Member Roles, and Contributions

The final three statements that had very strong agreement across the factors fall into the "other" category. The factors are in nearly complete agreement that equity is important for effective team experiences. This includes everyone participating and doing his or her fair share. All factors rated statement 10 positively, and all but Factor 7 rated statement 9 positively. Lastly, clearly defining roles, in which is more in keeping with cooperative learning than TBL instructional strategies, was rated positively by all but Factor 4, which rated this task as neutral.

Analysis of Factors

Despite commonalities across many of the factors, much can also be gained by considering the perception of each factor, as shown by the rankings in Table 4. Q Method analysis is both scientific and subjective. For each statement, the z-score and rank is known as the factor eigenvalue. In the subjective analysis, one must take a macro view of the ranking of the statements relative to each other to determine patterns and meaning.

Factor 1

Factor 1 is the strongest of the eight, with an extremely high eigenvalue, and it most closely matches the recommendations of TBL instructional strategies. Nearly all of the anti-TBL statements are at 0 or lower, and all of the pro-TBL statements are -1 or higher. The exception to this factor's agreement with TBL lies in its placement of statements 3, 10, and 13, which are process-focused practices that are discouraged by TBL (Michaelsen et al., 2004).

Factor 2

Factor 2 focuses on equity and individual responsibility while recognizing that all team members need to be involved. Statement 26 is a distinguishing statement and has the highest rank for the factor (+4). However, all other factors ranked this statement at -2 to +2. This placement, when considered with the other statements, implies that the students on this factor believe that motivation of their teammates will solve the individual responsibility issues.

Factor 3

Factor 3 wants the team to work effectively and has a reasonable understanding of how this can occur, as exhibited by highly ranked statements 7 (D) and ٩ (D). This factor attributes equity issues as the solution via statements 10, 11 (D), 13, and 26 (D).

Factor 3 has more distinguishing statements than any of the other factors, although Factor 8 is a close runner-up with 6 distinguishing statements. Interestingly, the two highest-ranked statements (7 and 9) address some of the most important tactical issues facing teamwork in classes. Many times, teams are expected to find a way to work together outside of the classroom. TBL instructional strategies advocate that this approach only exacerbates the free rider problem. Statements 7 (D) and 9 (D) as well as statement 6 show basic understanding of the elements necessary for effective teams, including physical classroom attributes. However, this factor is still stuck in the idea that equity must be ensured via team members with similar motivations, that is, they divide work equally and have clearly defined roles (statements 10, 26 (D), 11 (D) and 13). This belief may stem from past team experiences, which could not readily be measured by this instrument.

Factor 4

Of the 29 statements, a total of 9 statements categorized as O (other) encompass workload, roles, environment, and leadership. For factor 4, not only is statement 10 distinguishing, but six of the nine O statements are ranked positively on this factor. Interestingly, both statements considered anti-TBL and pro-TBL are ranked positively. Furthermore, all three of the grading and assignments statements (G), both pro- and anti-TBL, are positively ranked by this factor (statements 19, 22, and 23). The most interesting observation is that this factor loads negatively on all of the anti-TBL statements that are not related to grading and equity. In other words, students on this factor agree with the TBL instructional strategies concerning team formation and participation in decision making—as shown by statements 3, 4, 5, 25, 26, 27, 28, and 29 are all being ranked negatively. Nearly every pro-TBL statement of all three types sits in the middle of the Q sort distribution.

Factor 5

Every anti-TBL team formation statement is ranked at 0 or lower (0 to -3) for factor 5. The students on this factor clearly understand that formation of teams is critical. Statement 8, the only distinguishing statement for this factor, is ranked lowest in terms of importance (-4). All statements ranked +2 and + 3 are focused on fair share, equity, and grading contributions (that is, statements 9, 10, 11, 13, 21, and 23); thus, the students do not fully understand that with the appropriate assignments and interactions, most of the team problems they have experienced in the past should no longer occur.

Factor 6

Factor 6 appears to have had positive experiences with lecture and out-of-class group projects in homogenous groups. Statement 5 is ranked +2 for this factor (all other factors ranked this statement at +1 to -2). The factor understands that faculty should form the permanent teams, as indicated by the low ranking of statements 4, 26, 27, and 28. However, it appears that this factor believes that tasks and grading will "fix" the team problems. This factor has the lowest ranking of statement 7 (-2). This placement, in combination with a focus on lecture (statement 5, +2), indicates consistency in the factor. Based on the unimportance of statement 18, this factor seems to believe that everyone will work together well outside of class.

Factor 7

The most simplistic summary is that Factor 7 does not want teams; this factor wants groups. This factor is probably most closely aligned with the casual use of team practices described by Michaelsen et al. (2004). The ranking of statements on this factor shows that there is a clear lack of student understanding of the power of effective teams. This is the only factor with statement 27 (D) ranked at + 4. Statement 27 was ranked at -2 or lower by all other factors. The factor also had high ranking for assignments/interaction statements (statements 7, 15, 16, and 17) and process statements (statements 10, 12, 13, 24, and 25). This factor wants to meet outside of class (statement 24) but to be given enough time in class for teamwork (statement 7). It wants diversity in the teams, roles that are defined and rotated, formal decision-making processes, assignments that promote learning and interaction, and teams that switch frequently (statements 1, 13, 12, 25, 17, 15, and 27, respectively).

Factor 8

Of the top 7-ranked statements for Factor 8**,** five of them are process oriented (statements 3, 10, 11, 13, and 25). Statement 25 (D, +4) focuses on the adoption of a formal decision-making process; however, all other factors rank statement 25 at +1 or lower. Several other distinguishing statements add to the clear focus of dividing up work and putting the work together before handing it in: statements 18 (+3), 15 (-1), and 17 (-2). Factor 8 has the fewest pro-TBL statements in the top seven positions, followed by Factors 7 and 1, with five of seven anti-TBL statements. Statement 23 (D), ranked at -4, indicates that the students on this factor believe that everyone on the team should get the same grade on team assignments and that the processes will work. No other factor ranked statement 23 this low, nor was this statement distinguishing for any other factor. Statement 23 is probably the biggest difference between factors 6 and 8. Factor 6 wants grades to be different based on contribution (statement 23), but factor 8 wants everyone to receive the same grade. Factor 8 is consistent on the grading issue with statement 19 (-2), consistent on not working together during class with statements 7 and 8 (both at -1), and consistent on meeting outside of class with lecture in class with statements 24 and 5 (both at +1). Factor 8 might best be described as expressing the following student viewpoint: "If you lecture to us, we will divide the work up, meet outside of class, and should all receive the same grade."

Limitations and Future Research

There are limitations to this research. For example, only juniors at a mid-sized regional public AACSB accredited institution were subjects of the study. In addition, while Q Method has validity for the 29 statements chosen, many other factors could affect student perceptions of team effectiveness. Furthermore, the subjects of this research had varying team experiences from previous coursework prior to their participation in this research that could not be captured in the data. There are several opportunities for future research. Pre- and post-tests could be administered to students using Q Method to measure their team experience during a class. This particular study could be replicated to study team experiences of student populations beyond the undergraduate level, and from several different academic disciplines. The researchers also expect to move beyond student populations with this particular research, focusing their efforts on studying team experiences of industry professionals from a variety of different fields.

Conclusions

Most of the empirical research related to the effectiveness of teams focuses on only one or two elements of teams within any particular study. There does not appear, however, to be any literature that specifically considers how students rank a large set of elements with regard to their perceived importance to good team experiences. Students need to know why faculty do what they do. Most students understand that faculty should form diverse, permanent-term teams that are not based on the personalities or familiarity of team members. Students also seem to understand that the assignment matters—that it should be complex and generate high levels of interaction as well as promote learning and team development. Faculty should not spend too much time explaining team formation. Instead, they should spend time designing assignments that engage all team members meaningfully.

The challenge for faculty seems to be related to issues of process and grading—both of which are related to perceived equity. Faculty who use TBL instructional strategies will need to spend more time explaining why there is not a focus on process (see, for example, Chapter 1 of Michaelsen et al., 2004). Cooperative learning typically does include class time for teaching group processes. Whether faculty use TBL or CL, they may need to explain their inclusion or non-inclusion of peer evaluations in course grades.

Consideration of each factor individually can be even more overwhelming when a faculty member processes the results of this research. One way to understand students' preconceptions about these issues is to have them complete a short survey prior to the beginning of class or during the first week of class asking them to identify their concerns related to working with teams—for example, "You are likely to have worked in teams in previous courses. Explain the conditions that you believe lead to good experiences with teams in the classroom." Posing such a question, whether in class or in an on-line pre-course survey, will allow faculty quickly to understand the viewpoint of the students and match them to one of the factors. Regardless of the instructional methodologies or strategies adopted, all students need faculty to help them understand faculty members' efforts to create positive team experiences.

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Appendix A **The Q Statements (Concourse)**					
1. Teams should be very diverse (race, major, gender, etc.).	2. Teams should be formed by the course instructor.	3. Teams should be encouraged to choose a leader	4. Teams should largely consist of people who know each other.	5. Faculty who lecture and use teams create the best environment.	6. The classroom should be constructed in a way as to support team interaction.
7. Teamwork should be done in the classroom; enough time should be given for team work.	8. Teams should sit together every day.	9. Team members should make sure everyone participates and understands.	10. Everyone should do their fair share.	11. Team members should divide work equally.	12. Team members should rotate who does which assignment.
13. Roles of team members should be clearly defined.	14. Team assignments should require teams to use course concepts to make decisions & report those decisions in a simple form comparable across teams.	15. Team assignments should generate a high level of interaction.	16. Teams should create something that can be readily compared across teams.	17. Assignments must promote both learning and team development.	18 Assignments should be structured such that each person can do his/her own part, and then the team can combine their efforts before the assignment is due.

19. Peer evaluations should affect grades.	20. Teams should complete both small projects and assignments as well as bigger projects.	21. Individual members should be responsible for pre-class individual preparation.	22. Students should have both individual and team grades assigned.	23. Grades should be based on each member's contribution to the team.	24. Teams should include people on a similar schedule so they can meet outside of class.
25. Teams should be encouraged to adopt a formal decision-making process.	26. Teams should include people with similar motivation levels.	27. Team members should be switched frequently.	28. Teams should be formed by students.	29. Teams should include people with similar personality types.	

Appendix B
Statements With Categories and References

Statements	*Michaelsen et al. (2004) page reference*	*TBL: Pro, Anti, or Neutral*	*Type*	*Team Process*	*Forming Teams*	*Classroom*	*Roles*	*Contribution*	*Assignments*	*Teaching*	*Grading*
1.Teams should be very diverse (race, major, gender, etc.).	29, 75	P	T		x						
2.Teams should be formed by the course instructor	30	P	T		x						
3.Teams should be encouraged to choose a leader.	20, 21	A	T	x							
4.Teams should largely consist of people who know each other.	29	A	T		x						
5.Faculty who lecture and use teams create the best environment.	28	A	O							x	
6.The classroom should be constructed in a way as to support team interaction.	56, 156	P	O			x					

7.Team work should be done in the classroom, enough class time should be given for team work.	13, 57	P	O					x	x
8.Groups should sit together every day.	156	P	O		x				x
9.Team members should make sure everyone participates and understands.	12	P	O	x					
10.Everyone should do their fair share.	14-17	A	O	x			x		
11.Team members should divide work equally.	53, 54	A	O	x			x		
12.Team members should rotate who does which assignment.	8, 13, 15	A	O	x		x	x		
13.Roles of team members should be clearly defined.	14-16	A	O	x		x	x		
14.Team assignments should require teams to use course concepts to make decisions and report those decisions in a simple form comparable across teams.	33, 62	P	G					x	
15.Team assignments should generate a high level of interaction.	33	P	G					x	

Appendix B (*continued*)
Statements With Categories and References

Statements	*Michaelsen et al. () page reference*	*TBL: Pro, Anti, or Neutral*	*Type*	*Team Process*	*Forming Teams*	*Classroom*	*Roles*	*Contribution*	*Assignments*	*Teaching*	*Grading*
16.Teams should create something that can be readily compared across teams.	32	P	G						x		
17.Assignments must promote both learning and team development.	28	P	G						x		
18.Assignments should be structured such that each person can do his/her own part and then the team can combine their efforts before the assignment is due.	53	A	G						x		
19.Peer evaluations should affect grades.	31	P	G								x
20.Teams should complete both small projects & assignments as well as bigger projects.	57, 58	N	G						x		
21.Individual members should be responsible for pre-class individual preparation.	31	P	G						x		

22.Students should have both individual and team grades assigned.	28, 30, 32	P	G				x	x
23.Grades should be based on each member's contribution to the team.	App. B, 32	N	G			x		x
24.Teams should include people on a similar schedule so they can meet outside of class.	13, 57	A	T		x			
25.Teams should be encouraged to adopt a formal decision-making process.	17, 20, 21	A	T	x				
26.Teams should include of people with similar motivation levels.	15	A	T		x			
27.Team members should be switched frequently.	30	A	T		x			
28.Teams should be formed by students.	28	A	T		x			
29.Teams should include people with similar personality types.	28	A	T		x			

Appendix C
Survey Instrument

(Pre-test) Questionnaire/Survey

Please answer the following questions:

What is your name (*note:* this will be used to match pre & post results; then names will be deleted)?

What is your age today?

What is your gender (circle)? male female

Are you a US citizen? yes no

What is your major (circle all that apply)?

BSBA Accounting BSBA Computer Information Systems

BSBA Economics BSBA Entrepreneurship and Social Enterprise

BSBA Finance BSBA Hospitality

BS Hotel & Restaurant Administration BSBA Marketing

BS Aviation BS Graphic Design BSBA Management

BSBA Individualized major (list):

Other (list):

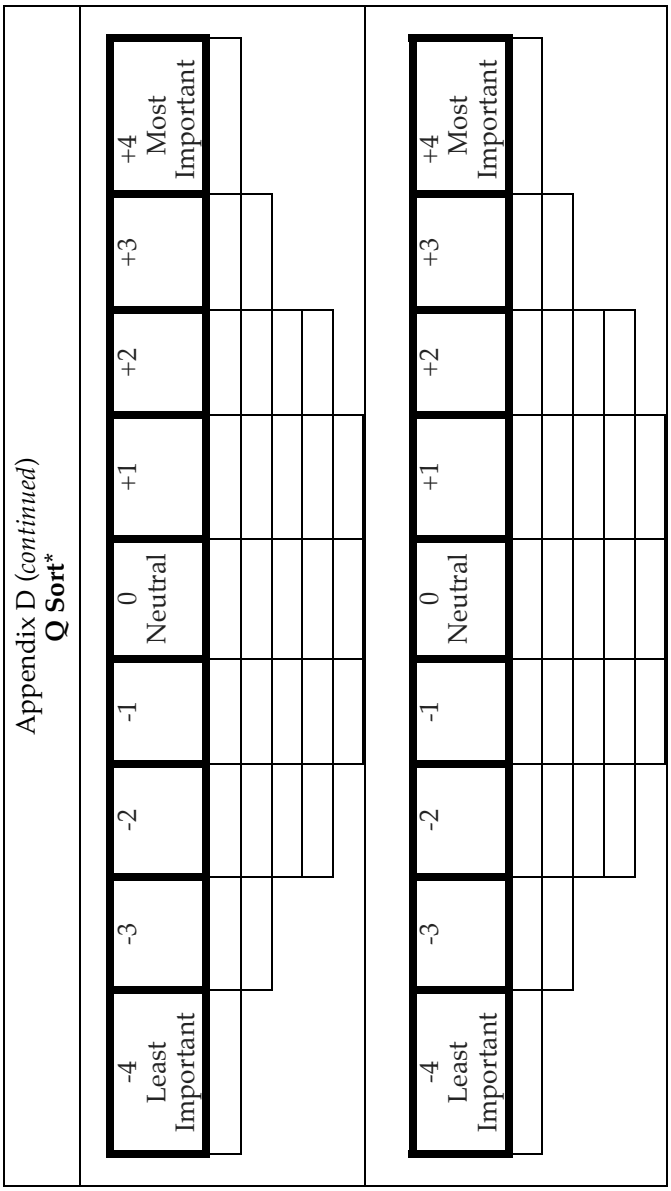
Did you take the 12-credit integrative block of classes?* Yes No

Please turn the paper over and continue to follow the directions.

Appendix D
Q Sort*

The next task is a bit unusual. You have been given 29 statements on small slips of paper (they are clipped to this paper). You should arrange those slips of paper on the diagram at the top of the page, and then write the number from each statement into the diagram at the bottom of the page using the following directions.

Your directions: As you consider each statement on each slip of paper, you should think about whether or not you think that **the particular statement describes something that is or is not important to good team experiences in the classroom**. Then, arrange the statement slips of paper onto the top diagram in the shape of a normal distribution as shown. Place the statement that you think is most important to good team experiences in the classroom on the far right top row of the chart (under +4). The statement you think is the least important to a good team experience in the classroom should be placed on the far left of the chart (under -4). Continue arranging the statement slips of paper until the chart is full. Then write the number of each statement as you sorted them on to the diagram at the bottom of the page.


Appendix D (*continued*)
Q Sort*
-4 Least Important
-3
-2
-1
0 Neutral
+1
+2
+3
+4 Most Important
-4 Least Important
-3
-2
-1
0 Neutral
+1
+2
+3
+4 Most Important

Record the numbers on the statement slips that you sorted above on the chart below. Now, collect the statement slips, clip them back together, put the slips and this paper into the envelope provided, and seal the envelope. Then hand in all materials. Note that your name will be used only to match your results to the survey in the database; then all identifying information will be deleted. Also, the instructor will NOT see your results; a third party will process all results and provide raw data to the instructor.
**Note*. Each subject was given a consent form, a short demographic survey, an 11"x17" version of Appendix A, with each statement already cut out to an approximately 1.5"x2" size, and an envelope. The subjects' instructions were in keeping with "a condition of instruction" as described in McKeown and Thomas (2013, p. 26).