Student and Faculty Perception of Team Design Elements in the Classroom

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Studies which compare perceptions of students and faculty on team-based design elements are lacking in the literature. Understanding perception helps identify areas where agreement exists and explanation is needed. Q Methodology was used to compare student perceptions from Opatrny-Yazell and Houseworth (2018) to faculty perceptions on 29 team-based design elements. Participants indicated whether or not they were perceived as important to good team experiences in the classroom. This research identifies students and faculty viewpoints. Tenets of collaborative learning, along with three, evidence-based instructional practices, team-based learning (TBL); problem-based learning (PBL); and cooperative learning, emerged as important within the resultant viewpoints.

Keywords: teamwork, teams, perception, team-based learning, problem-based learning, cooperative learning, collaborative learning, Q methodology, team-based pedagogical platforms, education, team pedagogy, team experience, evidence-based instructional practices

INTRODUCTION

Studies which compare perceptions of students and faculty on team-based design elements are lacking in the team pedagogical literature. Recent studies have confirmed that when faculty help students understand why they are using particular elements in the team classroom, student perception of learning increases (Deslauriers, McCarty, Miller, Callaghan & Kestin, 2019). Understanding perception is the first step to identifying areas where agreement exists and where explanation is needed.

This study considers both faculty and student perception of team-based elements in the classroom. Only elements that faculty can control were considered; these are referred to by Kidder and Bowes-Sperry (2012) as team design decisions. There is no question that both faculty and students have varying understandings of teamwork in the classroom which are influenced by past experience (Rentsch, Heffner, & Duffy, 1994). Business graduates are expected to be prepared to work effectively with others, for example, as specified by AACSB Standard 9, "Interpersonal relations and teamwork (able to work effectively with others and in team environments)"; (see also, Crawford, Lang, Fink, Dalton & Fielitz, 2011). The NACE 2020 Job Outlook lists “teamwork/collaboration” as the second most essential career

readiness skill and the skill at which graduates are most proficient. Though the literature has evaluated various team elements, challenges, and benefits, for the most part, each element is considered separately. See Opatrny-Yazell and Houseworth (2018) for a review of this literature.

The goal of this research was to build on the study of Opatrny-Yazell and Houseworth (2018), which considered student perceptions of team elements. In their study, student participants rank-ordered 29 team-based elements which faculty can control or influence. These were then factor analyzed using Q Methodology. The demographics from the study by Opatrny-Yazell and Houseworth (2018) are shown in Table 1. Opatrny-Yazell and Houseworth (2018) did not address whether the faculty viewpoint differed from that of the students'. Thus, the current research compares student and faculty perceptions via Q Method. Faculty participants rank-ordered the same statements; the resultant faculty factors were compared with the eight student factors which resulted from Opatrny-Yazell and Houseworth's (2018) work.

TABLE 1
DEMOGRAPHICS OF SUBJECTS ON FACTORS 1-8

Factor #	# Subjects on Factor	Average Age	Age Range	Female	Male	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%

The results show four viewpoints or factors which appear to be in alignment with many of the tenets of team-based learning (TBL), problem-based learning (PBL) with self-determination underpinnings, collaborative learning, and cooperative learning. Though this research was not designed to test the alignment of factors with the various pedagogical methods, the emergence of the possible alignment in the factors was recognized in the analysis stage of the research rather than hypothesized prior to the research.

All four resultant factors (viewpoints) have strong agreement related to a few elements. The takeaways from the research indicate that there appear to be a few viewpoints which seem to align fairly closely with team-based pedagogical platforms. Three are evidence-based instructional practices (Davidson, Major, & Michaelsen, 2014): team-based learning (TBL), cooperative learning, and problem-based learning (PBL). Collaborative learning is research-based but has not been proven to increase learning outcomes (Davidson et al., 2014). Effectiveness of the methods has been evaluated in health professions education as well (e.g., Albanese & Dast, 2014; and Haidet, et al., 2012). The Journal on Excellence in College Teaching, 2014 Vol 25, Issue 3/4, focuses on PBL, TBL, cooperative learning and collaborative learning which are discussed and compared in great detail (see Davidson & Major; Savin-Baden; Marra, Jonassen, Palmer & Luft; Millis; Love, Dietrich, Fitzgerald & Gordon; Jones; Johnson, Johnson & Smith; Haidet, Kubitz & McCormack; Davidson, Major & Michaelsen). Michaelsen, Davidson & Major (2014) note commonalities and differences between TBL, PBL, and cooperative learning and provide a succinct summary table which compares the three.

Faculty should be relieved that, for the most part, students share many of the same views as faculty and share viewpoints which are in alignment with the team-based pedagogical platforms. However, because there are multiple viewpoints, it is critical that faculty explain why they are choosing to use the particular team-based pedagogical elements in the classroom to their students. This is supported by the

recent conclusions of Deslauriers, et al. (2019) and Tharayil et al. (2018) which suggest that student attitudes towards active learning can improve if active learning methodologies are explained and facilitated.

LITERATURE REVIEW

Teams in the Classroom

The focus of this research is student and faculty perceptions of various team elements in the classroom. The literature focuses on attitudes and perceptions of one or a few team elements rather than many simultaneously. While not exhaustive, the following gives examples of recent literature which considers the perception of attitudes of team learning, team formation methodologies, peer evaluations, social loafing, use of class time for teams, student-managed teams, teaching team roles, learning styles, etc. Thompson, Anitsal, and Barrett (2008) consider attitudes towards teamwork in a comparison of secular vs. religious-based universities. Pociask, Gross, and Shih (2017) consider whether team formation affects several factors, including student attitude within a collaborative learning environment. Siha and Campbell considered student perception related to methods for forming teams (2015). Wright, Michaelsen, and McCord (2014) considered team formation for students with previous team-based learning (TBL) experience. Troisi (2015) considers students' feelings of autonomy when student-managed teams are used in the classroom. Mentzer, Laux, Zissimopoulos, and Richards (2017) investigate the impact of formative peer evaluations as used in collaborative learning with a grounding in self-determination theory. Jassawalla and Sashittal (2017) consider student perception of peer evaluations when those evaluations are highly consequential. McClure, Webber and Clark (2015) explored differing student and faculty perceptions of peer evaluations. Jassawalla, Sashittal, and Malshe (2009) consider students' perception of social loafing. Kidder and Bowes-Sperry (2012) consider the effect of team project design decisions on student perception and faculty evaluations. Ott, et al. (2018) consider students' perception of assigned roles in teams. Barnes and Jacobsen (2015) identify millennial's perception of and preference for learning environments. Deslauriers, et al., (2019) and Tharayil et al. (2018) indicate that faculty should explain why they are using an active learning pedagogical methodology to improve the perception of learning.

There is scant literature related to the perceptions of both students and faculty on multiple dimensions of team design decisions. One exception is Opatrny-Yazell and Houseworth (2018). They identify areas of student agreement and "significant differences in student perceptions of elements that affect positive team experiences" (Opatrny-Yazell and Houseworth, 2018, p. 43). The authors were unable to find other research which considers student or faculty perception of multiple teamwork elements in the classroom and which forces the subjects to rank order the important elements, versus, for example, Likert Scale for a few elements.

As noted in Opatrny-Yazell and Houseworth (2018), "the authors embarked on a study to understand the student perspective on which elements of teamwork are important to good team experiences in the classroom. Analyzing factors using Q Methodology uses 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)" (Opatrny-Yazell and Houseworth, 2018, p.48-49).

Q Methodology

Opatrny-Yazell and Houseworth (2018) chose Q Methodology, often described as mixed-method, which allows consideration of subjective viewpoints which are analyzed quantitatively via factor analysis (Newman & Ramlo, 2010). Q Methodology, initially developed by Stephenson, is used in this research as presented and interpreted by Stephenson (1935, 1953, 1977), Brown (1980, 1986), McKeown and Thomas (1988, 2013) and Watts and Stenner (2012). Q Methodology allows an analysis of subjective perceptions of the most and least important elements; in this case, those related to the positive use of teams in the classroom (McKeown & Thomas, 1988). Mathematically, Q Method is not significantly

different from factor analysis; the difference is what is measured. A full explanation can be found in Brown (1980), McKeown and Thomas (1988; 2013), Watts and Stenner (2012), The journal Operant Subjectivity, and QMethod.org are also useful references.

Mathematically, Q Method works in the same way as factor analysis. The difference is in the interpretation. "Q studies, from conception to completion, adhere to the methodological axiom that subjectivity is always self-referent and can be demonstrated to have structure and form" (McKeown &Thomas, 2013, pp. 2-3; from Brown, 1986). "In Q Methodology, the observer and the observed are identical; only the individual can measure his or her subjectivity. The methodology seeks to reveal these subjectivities without confounding them with operational measurements" (McKeown & Thomas, 2013). Q Methodology is particularly robust with regard to the number of participants needed; it only requires enough subjects to establish the existence of a factor for purposes of comparing one factor with another (Brown, 1980; Benedict 1946). Watts and Stenner (2012) suggest that an appropriate number of participants is one participant for every two Q statements. This research has 29 Q statements, also referred to as the Q sample, thus approximately 15 faculty participants is appropriate in this study.

METHODOLOGY

The Q Sample (Statements)

Q Methodology is unique in its ability to both require the user to rank the elements (statements) in terms of their own importance and their importance with respect to other elements. This research uses the same research protocol as Opatrny-Yazell and Houseworth (2018) including the 29 statements which were the result of a discursive approach to identify themes related to teamwork. The Q sample is the set of statements which are ranked against each other by each subject. The Q sample is shown in the first column of Table 2. McKeown and Thomas (2013) explain this 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 platform in a grounded and cohesive manner, rather than drawing connections across multiple pedagogical theories, as shown in Table 2. TBL was chosen by Opatrny-Yazell and Houseworth (2018) because it is the team-based platform utilized by the authors. Opatrny-Yazell and Houseworth (2018) do not attempt to convince readers of the merits of various team-based pedagogical platforms. The Journal on Excellence in College Teaching (2014, vol. 25, Issues 3 & 4) provides comprehensive reviews and comparisons of TBL, PBL, cooperative learning, and collaborative learning.

TABLE 2
Q STATEMENTS CATEGORIZED

	TBL: Pro, Anti, Neutral	Type	Team Process	Forming Teams	Classroom	Roles	Contribution	Assignments	Teaching	Grading	Equity
01.Teams should be very diverse (race, major, gender, etc.).	P	T		x							
02.Teams should be formed by the course instructor	P	T		x							
03.Teams should be encouraged to choose a leader	A	T	x								
04.Teams should largely consist of people who know each other	A	T		x							
05.Faculty who lecture and use teams create the best environment	A	O							x		
06.The classroom should be constructed in a way as to support team interaction	P	O			x						
07.Team work should be done in the classroom, enough class time should be given for team work	P	O						x	x		
08.Groups should sit together every day	P	O			x				x		
09.Team members should make sure everyone participates and understands	P	O	x								x
10.Everyone should do their fair share	A	O	x				x				x
11.Team members should divide work equally	A	O	x				x				x
12.Team members should rotate who does which assignment	A	O	x			x	x				
13.Roles of team members should be clearly defined	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	P	G						x			
15.Team assignments should generate a high level of interaction	P	G						x			
16.Teams should create something that can be readily compared across teams	P	G						x			
17.Assignments must promote both learning and team development	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	A	G						x			x
19.Peer evaluations should affect grades	P	G								x	x
20.Teams should complete both small projects & assignments as well as bigger projects	N	G						x			
21.Individual members should be responsible for pre-class individual preparation	P	G						x			x
22.Students should have both individual and team grades assigned	P	G						x		x	x
23.Grades should be based on each member's contribution to the team	N	G					x			x	x
24.Teams should include people on a similar schedule so they can meet outside of class	A	T		x							
25.Teams should be encouraged to adopt a formal decision-making process	A	T	x								
26.Teams should include of people with similar motivation levels	A	T		x							
27.Team members should be switched frequently	A	T		x							
28.Teams should be formed by students	A	T		x							
29.Teams should include people with similar personality types	A	T		x							

Table 2 shows each statement and its relationship to the TBL literature, as identified by Opatrny-Yazell and Houseworth (2018). Each statement was identified as either in agreement with TBL (pro-TBL), in disagreement with TBL (anti-TBL) or neutral relative to TBL. The statements were also identified as related to forming teams (T); related to teaching, grading, and assignments (G); and other statements such as those about team processes, the classroom space, member roles, and contributions (O). Lastly, the Q statements were categorized at a micro-level as either team processes, forming teams, the classroom space, member roles, contribution, assignments, teaching, grading, and/or equity.

Data Collection and Factor Analysis

In the original study of student perceptions by Opatrny-Yazell and Houseworth (2018), the instrument consisted of a short survey and a Q sort with directions, shown in Appendices 1a and 1b, accompanied by 29 small cards each printed with one Q statement as listed in the first column of Table 2. This particular research seeks to extend their study by incorporating the viewpoints of faculty. The first author, a student of Brown decades ago, corresponded with Brown (2019) with respect to the question of how to compare the student and faculty factors. He indicated that one strategy for this comparison is "a second-order analysis…Brown 1976 (p. 111) and on pp. 66, 168 of Political Subjectivity (Brown, 1980). This consists of entering the factor-score arrays from the factors in study 1 [student] along with the factor-score arrays from the factors in study 2 [faculty] and then factor analyzing the factors to determine which …[are] comparable" (Brown, 2019).

The data from the original study of student perceptions by Opatrny-Yazell and Houseworth (2018) are utilized for comparison with faculty perceptions using the same methodology. Prior to the Management and Organizational Teaching Society (MOBTS) conference in June 2019, the authors used the MOBTS listserv to ask for faculty volunteers to participate in the study. The MOBTS focuses on teaching whereas other academic management organizations focus both on research and teaching, for

example. Thus, the expectation was that MOBTS faculty would be inclined to participate and be more likely to utilize teams in the classroom. Demographics of the respondents are shown in Table 4. McKeown and Thomas (2013) note "No special effort is made to ensure complete representativeness across respondent characteristics… since the purpose is to explore the attitudes of a population (p. 32)." Faculty volunteers completed the survey in Appendix 2a and the Q sort as directed in Appendix 2b.

TABLE 3
FACTORS, EIGENVALUES AND LOADINGS

	Factor (F1)	Factor (F2)	Factor (F3)	Factor (F4)
Eigenvalue	4.2423	1.6246	1.2507	1.0299
% Explanatory Variable	35.3528	13.5387	10.4223	8.5823
Cumulative %	35.3528	48.8915	59.3138	67.8961
StuF1	67.67%			
StuF2	51.42%			
StuF3		89.94%		
StuF4	63.79%			
StuF5		53.74%		
StuF7			86.38%	
StuF8				83.35%
FacF2			-67.94%	
FacF4				71.78%

*StuF6, FacF1 and FacF3 did not load on a factor in the comparison study.

The Q sorts from the seventeen MOBTS participants were analyzed with the PQ Method Release 2.35 (http://schmolck.userweb.mwn.de/qmethod/) software following the same protocol as the original student study. After the data were entered, factor analysis was conducted, varimax rotation was then conducted resulting in 4 significant faculty factors. Following the advice of Brown (2019), the Q sorts of the eight student factors (i.e., StuF1 – StuF8) and the four faculty factors (i.e., FacF1-FacF4) were again input into PQ Method 2.35 for factor analysis and varimax rotation.

There were four significant resultant factors. Table 3 shows the eigenvalues and factor loadings for each of the four factors (i.e., F1-F4). "The most common practice is to employ the eigenvalue criterion, whereby a factor's significance (importance) is estimated by the sum of its squared factor loadings…by convention, factors with eigenvalues greater than 1.00 are considered significant (McKeown & Thomas, 2013, p. 53)." "Factor loadings are in effect correlation coefficients (McKeown and Thomas, 2013, p 53)" and, for example, StuF1 which represents the first student factor from the original study by Opatrny-Yazell and Houseworth (2018), represents a 67.67% correlation on F1 which is the first factor in this comparison study.

TABLE 4
DEMOGRAPHICS OF MOBTS FACULTY PARTICIPANTS

	# undergrad	# graduate	# years taught	Type of institution		Primary Faculty Role	
Mean	7,389	1747	17	Public	7	Teaching	12
Minimum	300	0	6	Private	8	Research	1
Maximum	13,000	7000	45	Not reported	2	Exec. Coach	1
Not reported	5	4	2			Dept. Chair	1
						Not reported	2

The four significant resultant factor arrays, shown in Table 5, for F1 through F4 are each a composite Q sort of all the Q sorts on that particular factor. The final step, as described by McKeown and Thomas "is the task of distilling the core meanings…achieved in terms of consensual and divergent subjectivity, with a special emphasis on the contextuality principle given succinct expression by Lasswell (1948): 'The meaning of any detail depends on its relationship to the whole context of which it is a part' (p.215)… an effort is made to examine the patterns of meaning within the broader contextual constellation provided by a given factor array, with attention given to the relevance of such patterns to existing or emerging theories or propositions" (2013, p. 6). As shown in Appendices 1b and 2b, a rank of +4 indicates the element that is most important to good team experiences in the classroom. Likewise, a rank of -4 is the least important. Statement rankings which are in bold italics font indicate a distinguishing statement at p,.05 and those in underlined bold font indicate a distinguishing statement at p <.01. The results of the factor analysis are discussed by comparing the commonalities and differences among the factors in the next sections.

TABLE 5
FACTOR ARRAYS

	Factor 1 (F1)	Factor 2 (F2)	Factor 3 (F3)	Factor 4 (F4)
01.Teams should be very diverse (race, major, gender, etc.).	1	-1	2	-3
02.Teams should be formed by the course instructor	-1	-2	3	-1
03.Teams should be encouraged to choose a leader	0	1	-4	2
04.Teams should largely consist of people who know each other	-3	1	-2	-4
05.Faculty who lecture and use teams create the best environment	-2	0	-1	-1
06.The classroom should be constructed in a way as to support team interaction	1	2	-2	1
07.Team work should be done in the classroom, enough class time should be given for team work	-1	3	3	-2
08.Groups should sit together every day	2	1	0	-2
09.Team members should make sure everyone participates and understands	3	4	-2	2
10.Everyone should do their fair share	4	3	1	3
11.Team members should divide work equally	2	2	0	1
12.Team members should rotate who does which assignment	-2	-1	2	0
13.Roles of team members should be clearly defined	2	2	0	2
14.Team assignments should require teams to use course concepts to make decisions and report those decisions in a simple form comparable across teams	0	0	1	3
15.Team assignments should generate a high level of interaction	1	0	1	0

16.Teams should create something that can be readily compared across teams	-2	0	2	0
17.Assignments must promote both learning and team development	3	1	1	-1
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	-1	1	-2	2
19.Peer evaluations should affect grades	1	-4	-3	0
20.Teams should complete both small projects & assignments as well as bigger projects	-1	-1	-1	1
21.Individual members should be responsible for pre-class individual preparation	1	0	-1	1
22.Students should have both individual and team grades assigned	2	-3	-1	-1
23.Grades should be based on each member's contribution to the team	0	-1	0	-3
24.Teams should include people on a similar schedule so they can meet outside of class	0	-2	1	0
25.Teams should be encouraged to adopt a formal decision making process	0	-2	2	4
26.Teams should include of people with similar motivation levels	-1	2	0	-1
27.Team members should be switched frequently	-4	-3	4	-2
28.Teams should be formed by students	-2	-1	-3	-2
29.Teams should include people with similar personality types	-3	-2	-1	1

RESULTS

Consensus

In Q, those statements which are ranked in a similar way by the resultant factors are called consensus statements. Six of the Q statements are consensus statements in this study and are shown in Table 6. Those marked with an asterisk (*) are non-significant at $p > .05$ while those not marked are non-significant at $p > .01$. As is shown in Table 6, statements 5 and 28 have negative factor loadings on the factor arrays. Thus, the consensus view is that working in teams is not suited to a lecture environment and that students should not form teams themselves. The factors agree with statement 13 as indicated by the positive factor loadings in Table 5; team roles should be clearly defined.

TABLE 6
CONSENSUS Q STATEMENTS

5* Faculty who lecture and use teams create the best environment
13 Roles of team members should be clearly defined
15 Team assignments should generate a high level of interaction
20* Teams should complete both small projects & assignments as well as bigger projects
21 Individual members should be responsible for pre-class individual preparation
28 Teams should be formed by students

In addition, the consensus statements suggest that faculty should implement a course design that nurtures the early stages of team development, including norm-setting and role identification. Clarifying roles early in the team process allows for coordinated skills development (McIntyre & Salas, 1995) and corresponds directly with consensus statement 13. Development of team norms helps students identify core values, coordinate team activities, and define appropriate behavior (Feldman, 1984). While statements 15, 20 and 21 are consensus statements, these are ranked in a neutral zone which indicates that these elements are perceived as neither the most nor least important to good team experiences in the

classroom. Thus, the consensus is that it is of moderate importance to set early expectations for values and behaviors that will allow members of student teams to have clear expectations of regarding team interactions and classroom preparation.

Factors 1, 2, 3 (positive loading), and 4 are all in agreement that students should not form teams. While there is clear support for student formed teams as discussed for the negative loading faculty on Factor 3, there is also clear support for the formation of teams by other methods. Michaelsen et al. (2004) indicated that diverse teams would spread assets and liabilities more evenly across teams. Pociask et al. (2017) tested three different team formations: random, student formed, and instructor formed. Their results indicated that instructor formed teams were more diverse, but student performance was no better than their peers using the other two formation methods. Wright et al. (2014) found that students with previous team-based learning (TBL) experience earned higher peer evaluations and thus would suggest that diverse faculty-formed teams are appropriate when some of the students have had prior TBL experiences. Thus, as stated earlier, faculty should, at the very least, clearly communicate the reasons certain team formation decisions have been made in their classrooms.

Analysis of Factors

Factor 1 (F1)

As shown in Table 3, StuF1, StuF2, and StuF4 load on F1 with the factor array in Table 5. This factor seems to align most closely with the Team-Based Learning (TBL) viewpoint (e.g., Michaelsen, et al., 2004) as exhibited by the majority of "P" or pro-TBL practices which are present in the top dozen ranked items in the F1 factor array. This alignment is not surprising. The research of Opatrny-Yazell and Houseworth (2018) was conducted within a business school at a university where the founder of TBL taught. Some of the faculty with whom the student subjects may have had a previous class use TBL in the classroom. However, as is pointed out in other research studies, results have shown that prior classroom team experiences have led to both positive and negative viewpoints by students (Rentsh, et al., 1994).

This factor clearly believes that faculty formed teams which are not switched and are formed without concern for previous relationships, personality or motivation levels are important. This factor wants a classroom and assignments conducive to interactive teamwork where peer evaluations can affect grades and team members are responsible for preparation outside of class where both individual and team grades are assigned.

Factor 2 (F2)

Johnson et al. (1998) identify five key cooperative learning elements. Of those, three are evident in this factor. Face-to-face promotive interaction is present in the placement of statements 7, 6, 8, and 15. Individual and group accountability relate to statements 13, 3, and 7. Lastly, the development of teamwork skills is connected with statement 21. All are ranked at 0 or higher and are therefore of importance to good team experiences for this factor. As noted by Davidson and Major, "the main idea in all cooperative learning approaches is that students work and learn together actively in small groups to accomplish a common goal in a mutually helpful manner (2014, p.14)."

Interestingly, despite concern about everyone doing their fair share and dividing work equally, this factor does not want peer evaluations nor member contributions to affect grades nor to be assigned individual and team grades. This does coincide as peer evaluations are not necessarily included in cooperative learning approaches.

Only student factors (i.e., StuF3 and StuF5) load on this factor. An alternative explanation may be that this factor represents the social loafer or slacker viewpoint because of the very low ranking of statements 19, 22, and 23 (Boren & Morales, 2018).

Factor 3 (F3)

This factor is different than the others because it consists of one student factor (StuF7) from the original study, which has an 86.38% correlation and a faculty factor (FacF2). The student factor loads in agreement with the factor array, F3, as shown in Table 4. However, the faculty factor loads negatively (-

69.74%) on this factor. This means that the faculty factor has a viewpoint which is opposite of the factor array for F3. From an interpretation standpoint, the student viewpoint (StuF7) ranks statement 27 as the most important element of team experiences in the classroom with a +4 ranking. FacF2 on Factor 3 believes that statement 27 is the least important element. Thus, the two viewpoints are discussed separately.

The faculty factor (FacF2) which [negatively] loaded on this factor consisted of faculty who taught upper-level undergraduate organizational behavior courses. Reported class size varied from 5 to 50. The commonality across the courses was that an organizational behavior-related project for an external client was completed by student teams and resulted in a report written by the team as well as a presentation to the client. The assignment and faculty involvement align most closely with PBL (Davidson & Major, 2014). The ranking of some of the statements (e.g., statement 18) on the faculty negatively loaded factor are explainable because of the deliverable.

One of the more interesting statements for the [negative] faculty viewpoint on Factor 3 is the placement of statement 28 "teams should be formed by students." This statement is the second-highest ranked for the negative array of the factor. Every other factor ranked it in an opposite fashion. This factor also values choosing a leader and using peer evaluations to affect grades via the placement of statements 19 and 3: every other factor placed relatively low importance on these.

This viewpoint may be explainable with Self-Determination Theory; the concept that a student's motivation determines their effort and focus on learning (Cole, Field & Harris, 2004). Allowing students to form their own teams is related to the autonomy need (Deci, Connell & Ryan, 1989) and therefore increased engagement (Gagne & Deci, 2005). When faculty form teams, this can be used as a reason to blame others for performance issues (Ryan & Connell, 1989).

Less interesting is the student viewpoint represented by the positive Factor 3 array. The positively loaded [student] viewpoint is that the instructor should form diverse teams which are switched frequently. Team members should do their fair share but should also rotate who does which assignment and establish a formal decision-making process. There is a fair amount of focus on the assignment itself. However, this factor seems to want both enough time in class to complete team assignments and a similar schedule to meet outside of class; the ranking of these two statements seem at odds with each other. While this [positive] factor wants to rotate who does which assignment, the low ranking of statement 18, which relates to each person doing their own part of the assignment before it is due, again seems at odds with this desire. The [positive] array for F3 does not seem to align with a team-based pedagogical platform.

Factor 4 (F4)

Factor 4 consists of one student factor and one faculty factor, both of which loaded positively and indicates one shared viewpoint. The faculty on this factor reported using collaborative learning in graduate courses with 10-25 students. Collaborate, according to Davidson and Major (2014), "means to labor with each other towards the same end, but not necessarily cooperatively on the same task (p20)." They continue by noting "in collaborative learning, the focus is on working with each other (but not necessarily interdependently) toward the same goal (Davidson & Major, 2014, p.21)." This factor array indicates concern for equity, each person doing their own part and equal division of work. The placement of statements 18 and 11 in the factor array for F4 indicate that students are working to the same end but not necessarily on the same task. Davidson and Major note that in a collaborative project, "students could divide up the task and assemble the individual parts in order to accomplish the common goal (2014, p.21-22)." Student talking in small groups is central to collaborative learning (Barnes, 2008) which aligns with the placement of statements 9 and 6.

Additionally, F4 also believes that the team should receive one grade for team projects which is based neither on peer evaluations nor contribution (statements 9, 10, 11, 18, 21) and low importance to peer evaluations and grading related to contribution to the team (statements 19, 22 and 23). The focus on team processes such as establishing a leader, clearly defining roles and decision-making processes is also evident. There is little importance on the means by which teams are formed. One might conclude that this

factor believes that the right processes will create both a strong team regardless of formation methodology and which does not need to evaluate the work of the individual separately from the team.

DISCUSSION

Analysis

We can feel comfort in knowing that there are some team learning practices that appear have general agreement between faculty and students. These include the general agreement that students should not form teams, that the roles of team members should be clearly defined, and that faculty lecture does not create an environment for teamwork.

As noted by Davidson and Major in reference to communication with M. E. Weimer, "Most often, what students are doing in groups are blends of cooperative learning, collaborative learning and PBL, or some form of group work that is unique and only peripherally illustrative of these major forms (2014, p. 8)." Thus, it is clear both from this comment and our own experiences that most faculty use, and students experience, parts of many team-based pedagogical platforms. In this study, no factor represented a purist view of any of the four team-based pedagogies platforms (i.e., TBL, PBL, collaborative learning, cooperative learning).

Because we, as a faculty subscribe to different 'best practices' which may be influenced by factors like content, student ability, etc., students are likely to have experienced a variety of team methodologies by which they were influenced either negatively or positively. As a result, students do not have a shared viewpoint of best practices. Faculty must focus on many of their own behaviors and explanations early in the semester and explain and reinforce why we have chosen to facilitate teamwork within a particular course which should help students accept and understand choices made by faculty (Tharayil et al., 2018; Deslauriers et al., 2019).

CONCLUSIONS AND FURTHER RESEARCH

All student subjects were upper-level predominately business majors at one mid-west mid-sized public university learning in a face-to-face environment. The faculty respondents were all members of the MOBTS list-serv and as such have interest in a society with a mission to "enhance the quality of teaching and learning across the management disciplines (cite MOBTS website https://mobts.org/mission/)." The reported class size, teaching load, and institutional size reported by MOBTS faculty participants would indicate that they are probably not at "Research 1" institutions. The faculty and student subjects in this research may not be representative of the business faculty and student population.

As stated earlier, Q Methodology is particularly robust with regard to the number of participants needed; it only requires enough subjects to establish the existence of a factor for purposes of comparing one factor with another (Brown, 1980, p. 191-192; Benedict 1946, p. 16). All the factors represented in this study are valid viewpoints. McKeown and Thomas note that "the exclusive use of statistical criteria [eigenvalue] may lead one to overlook a factor, that although unimportant in terms of the proportion of the variance explained, nevertheless may hold special theoretical interest (2013, p.54)." While Q Method allows for investigation of any factor, the authors did not consider those with an eigenvalue below 1.0. Thus, there are viewpoints which are not represented in this study which could have included the faculty and student factors which did not load on the four factors discussed in this research.

Opatrny-Yazell and Houseworth (2018) categorized the 29 Q statements as they related to TBL. Thus, the statements did not include many of the tenets of PBL, cooperative learning, nor collaborative learning. The authors realized, after conducting the faculty portion of the study, that there seemed to be a connection of factors two, three, and four to PBL, self-determination theory, collaborative learning and cooperative learning. This study was not designed to test the alignment of factors with the various team-based pedagogical platforms; this possibility was recognized in the analysis stage, rather than hypothesized prior to the research.

Though faculty did not load on F1 and F2, we cannot conclude that faculty don't also share this viewpoint. The findings are preliminary due to the small number of Q statements which can be linked to these three team-based pedagogical platforms which were not part of the original research design (i.e., PBL, cooperative learning, collaborative learning). Future research opportunities include a confirmatory study with students and faculty, which incorporates more statements from all four team-based pedagogical platforms.

This research, however, does have clear implications for faculty. Agreement on some team practices does exist both for practices which are important to good team experience and those which are not. This research indicates that there is agreement between faculty and students on establishing team roles and team formation. Course design should include norm-setting and role identification early in the course. Students should not form teams unless there is a significantly sufficient reason for doing so, as discussed for F3. Faculty should clearly convey to students who will form teams and why. There is evidence that students do have an understanding of the various team-based pedagogical platforms. Faculty should evaluate their own team-based design decisions to ensure that their use can be explained to students. Then, faculty must help students understand which team design decisions they have made and why to gain student acceptance. This was recently underscored by Deslauriers et al. (2019) and Tharayil et al. (2018) who also note the importance of such actions.

REFERENCES

AACSB. Retrieved from https://www.aacsb.edu/accreditation/standards/business

Albanese, M. A., & Dast, L. (2014). Problem-Based Learning: Outcomes evidence from the health professions. *Journal on Excellence in College Teaching*, 25(3-4), 239-252.

Barnes, D. (2008). The value of exploratory talk. In Mercer, N. & Hodgkinson, S. (Eds.), *Exploring talk in school* (pp. 1-15). Los Angeles, CA: Sage.

Barnes, N. J., & Jacobsen, S. (2015). Meet the new class, same as the old class? Millennials and their surprising learning preferences. *Journal of Higher Education Theory and Practice*, 15(7), 24-30.

Benedict R. (1946). *The chrysanthemum and the sword: Patterns of Japanese culture*. Boston: Houghton Mifflin.

Boren, A. E., & Morales, S. (2018, April). Celebrities and slackers: A grounded theory of the dynamics of social loafing on student teams. *Journal of Leadership Education*, 42-59.

Brown, S. R., & Rothenberg, A. (1976). The analysis of group episodes. *Small Group Behavior*, 7, 287-306.

Brown S. R. (1980). *Political subjectivity, applications of Q methodology in political science*. New Haven, CT: Yale University Press.

Brown, S. R. (1986). Q technique and method. In Berry, W. D. & Lewis-Beck, M. S. (eds.). *New tools for social scientists: Advances and applications in research methods* (pp. 57-76). Beverly Hills , CA: Sage.

Brown, S. R. (2019, January 10). *Re: Q Method Question*. Received by Opatrny-Yazell.

Coke, J. G., & Brown, S. R. (1976). Public attitudes about land use policy and their impact on state policy-makers. *Publius, The States as Keystones: A Bicentennial Reassessment*, 6, 97-134.

Cole, M. S., Field, H. S., & Harris, S. G. (2004). Student learning motivation and psychological hardiness: Interactive effects on students' reactions to a management class. *Academy of Management Learning and Education*, 3, 64-85.

Crawford, P., Lang, S., Fink, W., Dalton, R., & Fielitz, L. (2011). *Comparative analysis of soft skills: What is important for new graduates?* Washington, DC: Association of Public and Land-grant Universities.

Davidson, N., Major, C. H., & Michaelsen L. K. (2014). Small-Group Learning in Higher Education--Cooperative, Collaborative, Problem-Based, and Team-Based Learning: An Introduction by the Guest Editors. *Journal on Excellence in College Teaching*, 25(3-4), 1-6.

Davidson, N., & Major, C. H. (2014) Boundary Crossings: Cooperative Learning, Collaborative Learning, and Problem-Based Learning. *Journal on Excellence in College Teaching*, 25(3-4), 7-55.

Deci, E. L., Connell, J.P., & Ryan, R. M. (1989). Self-determination in a work organization. *Journal of Applied Psychology*, 74, 580-590.

Deslauriers, L., McCarty, L. S., Miller, K., Callaghan, K., & Kestin, G., (2019). *Measuring actual learning versus feeling of learning in response to being actively engaged in the classroom*. Proceedings of the National Academy of Sciences,

Feldman, D. (1984). The development and enforcement of group norms. *The Academy of Management Review*, 9, 47-53.

Gagné, M., & Deci, E. L. (2005). Self-Determination theory and work motivation. *Journal of Organizational Behavior*, 26, 331-362.

Haidet, P., Levine, R. E., Parmalee, D. X., Crow, S., Kelly, P.A., Perkowski, L., . . . & Richards, B. E. (2012). Guidelines for reporting team-based learning activities in the medical and health sciences education literature. *Academic Medicine*, 87, 292-299.

Haidet, P., Kubitz, K., & McCormack, W. T. (2014). Analysis of the Team-Based Learning Literature: TBL Comes of Age. *Journal on Excellence in College Teaching*, 25(3-4), 303-333.

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

Jassawalla, A. R., & Sashittal, H. C. (2017). What students think and do in classroom teams when peer evaluations are highly consequential: A two-stage study. *Decision Sciences Journal of Innovative Education*, 15, 219-247.

Johnson, D. W., Johnson, R. T., & Smith, K. (2014). Cooperative learning: Improving university instruction by basing practice on validated theory. *Journal on Excellence in College Teaching*, 25(3-4), 85-118.

Jones, E. (2014). Examining the influence of structured collaborative learning experiences for graduate students. *Journal on Excellence in College Teaching*, 25(3-4), 163-175.

Kidder, D. L., & Bowes-Sperry, L. (2012). Examining the influence of team project design decisions on student perceptions and evaluations of instructors. *Academy of Management Learning & Education*, 11, 69-81.

Lasswell, H.D. (1948). *Power and personality*. New York, NY: WW Norton.

Love, A. G., Dietrich, A., Fitzgerald, J., & Gordon, D. (2014). Integrating collaborative learning inside and outside of the classroom. *Journal on Excellence in College Teaching*, 25(3-4), 177-196.

Marra, R. M., Jonassen, D. H., Palmer, B., & Luft, S. (2014). Why problem-based learning works: Theoretical foundations. *Journal on Excellence in College Teaching*, 25(3-4), 221-238.

Millis, B. J. (2014). Using cooperative structures to promote deep learning. *Journal on Excellence in College Teaching*, 25(3-4), 139-148.

McClure, C., Webber, A., Clark, G. L. (2015). Peer evaluation in team projects: What a major disconnect between students and business instructors. *Journal of Higher Education Theory and Practice*, 15(5), 27-35.

McIntyre, R., & Salas, E. (1995). Measuring and managing team performance: Lessons from complex environments. In R. Guzzo & E. Salas (Eds.), *Team effectiveness and decision making in organizations* (pp. 9-45). San Francisco, CA: Jossey-Bass.

McKeown, B., & Thomas, D. B. (1988). *Q methodology*. Newbury Park, CA: Sage Publications.

McKeown, B., & Thomas, D. B. (2013). *Q methodology* (2nd ed.). Thousand Oaks, CA.: Sage Publications.

Mentzer, N., Laux, D., Zissimopoulos, A., Andrew, D., & Richards, R. (2017). Peer evaluation of team member effectiveness as a formative educational intervention. *Journal of Technology Education*, 28(2), 53-82.

Michaelsen, L. K., Davidson, N., & Major, C. (2014). Team-based learning practices and principles in comparison with cooperative learning and problem-based learning. *Journal on Excellence in College Teaching*, 25(3-4), 57-84.

Michaelsen, L. K., Knight, A. B., & Fink, L. D. (2004). *Team-based learning: A transformative use of small groups in college teaching.* Sterling, VA: Stylus.

NACE. (2019). Job Outlook 2020. Bethlehem, PA: National Association of Colleges and Employers.

Newman, I., & Ramlo, S. (2010). Using Q-Methodology and Q factor analysis in mixed method research. In Tashakkori, A. & Teddlic, C. (Eds.), *Handbook of mixed methods in social and behavioral research* (2nd ed.) (pp.505-530). Thousand Oaks, CA: SAGE Publications.

Opatrny-Yazell, C., & Houseworth, M. (2018). Teamwork: Understanding Student Perceptions. *Journal on Excellence in College Teaching*, 29(2).

Ott, L. E., Kephart, K., Stolle-McAllister, K., & LaCourse, W. R. (2018). Students' understanding and perceptions of assigned team roles in a classroom laboratory environment. *Journal of College Science Teaching*, 47(4), 83-91.

Pociask, S., Gross, D., & Shih, M. (2017). Does team formation impact student performance, effort and attitudes in a college course employing collaborative learning? *Journal of the Scholarship of Teaching and Learning*, 17(3), 19-33.

Rentsch, J. R., Heffner, T. S., & Duffy L. T. (1994). What you know is what you get from experience: Team experience related to teamwork schemas. *Group and Organization Management*, 19, 450-474.

Ryan, R. M., & Connell, J. P. (1989). Perceived locus of causality and internalization: Examining reasons for acting in two domains. *Journal of Personality and Social Psychology*, 57, 749-761.

Savin-Baden, M. (2014). Using problem-based learning: New constellations for the 21st century. *Journal on Excellence in College Teaching*, 25(3-4), 197-219.

Siha, S., & Campbell, S. M. (2015). *Teamwork: Faculty and student experiences*. Unpublished manuscript, Kennesaw State University, Kennesaw, GA.

Stephenson W. (1935). Technique of factor analysis. *Nature*, 136, 297.

Stephenson W. (1953). *The study of behavior: Q-technique and its methodology*. Chicago, Ill.: University of Chicago Press.

Stephenson W. (1977). Factors as operant subjectivity. *Operant Subjectivity*, 1, 3-16.

Tharayil, S., Borrego, M., Prince, M., Nguyen, K. A., Shekhar, P., Finelli, C. J., & Waters, C. (2018). Strategies to mitigate student resistance to active learning. *International Journal of STEM Education*, 5(7), 1-16.

Thompson, D., Anitsal, I., & Barrett, H. (2008). Attitudes toward teamwork in higher education: A comparative study of religiously affiliated universities and secular-based universities. Allied Academies International Conference. *Proceedings of the Academy of Educational Leadership*, 13(2), 86-98.

Troisi, J. D. (2015). Student management teams increase college students' feelings of autonomy in the classroom. *College Teaching*, 63(2), 83-89.

Watts, S., & Stenner, P. (2012). *Doing Q Methodological Research: Theory, Method and Interpretation*. London: SAGE Publications, Ltd.

Wright, C., Michaelsen, L. K., & McCord, M. (2014) Can Transferable Team Skills be taught? A longitudinal study. *Academy of Educational Leadership Journal*, 18(2), 85-96.

APPENDIX 1A. SURVEY FOR STUDENTS

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? Circle your gender male female
Are you a US citizen? Yes No
What is your major (circle all that apply)?

BSBA Management	BSBA Finance
BSBA Entrepreneurship and Social Enterprise	BSBA Economics
BSBA Hospitality	BSBA Marketing
BS Hotel & Restaurant Administration	BSBA Accounting
BSBA Computer Information Systems	BS Aviation
BS Graphic Design	
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 1B. SORT INSTRUCTIONS FOR STUDENTS

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 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 which is important to good team experiences in the classroom or not. 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.

-4 Least Important	-3	-2	-1	0 Neutral	+1	+2	+3	+4 Most Important

Record the numbers on the statement slips which 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 only be used 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.

*Each subject was given a consent form, a short demographic survey, a 11"x17" version of Appendix 1, each statement already cut out to an approximately 1.5"x2" size and an envelope. Subjects instructions were in keeping with "a condition of instruction" as described in McKeown and Thomas (2013, pp 5-6).

APPENDIX 2A. SURVEY FOR FACULTY

Thank you for volunteering to participate. Please answer the following questions before completing the Q sort on the other side of this paper.

1. Approximately how many undergraduates are enrolled at the institution where you teach
2. Approximately how many graduate students are enrolled at the institution where you teach
3. At which type of institution do you teach? Private Public
4. Is your primary role teaching at a college or university? Yes No
   If no, describe your primary role?
5. In which discipline do you primarily teach?
6. In which discipline was your highest level degree earned?
7. How many years have you been teaching at the college/university level?
8. How many classes do you teach during a regular academic semester? This research uses Q

Q Methodology, often described as mixed-method, which allows consideration of subjective viewpoints which are analyzed quantitatively via factor analysis. Q Methodology allows analysis of subjective perceptions of the most and least important elements, in this case those related to positive use of teams in the classroom. We assume that you, the participant, teach more than one course and thus, it is important for us to understand your frame of reference as you complete the Q sort for which there are instructions on the back of this page. We would like you to keep in mind only one course which you teach and which utilizes teams as a significant element within the course as you complete the Q sort. Before you do this, we'd like you to tell us a few things about the course which you'll be keeping in mind as you complete the Q sort.

What is the title of the course?
How many students are typically in one section?
At which level is the course taught (e.g., undergrad/junior, graduate, etc.)?
Number of credit hours?
By which mode is this course taught (e.g., face to face, online, hybrid, if "other" please explain)?
Which team approach is most closely associated with your use of teams for the course you will keep in mind as you are completing the Q sort (e.g., Team-based learning, Collaborative learning, Discovery learning, Problem-based learning, etc.) Please name or describe the approach?
Please describe one of the main deliverables for which teams are responsible in the course (e.g., the assignment or other deliverable)?
Lastly, describe the manner in which the classroom you most typically use to teach this course organized (e.g., stadium style, pods, movable tables, etc.)?

Thank you. Please follow the directions on the other side of the paper.

APPENDIX 2B. Q SORT INSTRUCTIONS FOR FACULTY

Your instructions: You have been given 29 statements on small slips of paper (they were included in the envelop you received in the mail). As you consider each statement on each slip of paper, keep in mind only one course which you teach and which utilizes teams as a significant element within the course. This should be the course you described on the other side of this paper. Then consider each statement and determine whether, for your course, it describes something which is important to good team experiences

in this particular course or not. Then, arrange the statement slips of paper onto a flat surface in front of you in the shape of the distribution shown below. 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 you have sorted the statements into the shape below. Then write the number of each statement as you sorted them on to the diagram below for example, if statement 1 is the most important you would write the number 1 under +4, if statement 2 was the least important you would write the number 2 under -4, etc.

-4 Least Important	-3	-2	-1	0 Neutral	+1	+2	+3	+4 Most Important

You can now discard the slips of paper with the statements on them. To return your results please do one of the following:

1) Email an image of the signed consent form and the front and back of this paper to the primary author. She will confirm receipt and she will then print out your results and delete your email so that the results cannot be associated with you.
2) Return via mail, the signed consent form and this piece of paper in the self-addressed stamped envelope.

By returning your results in either of the two manners listed above, you are giving consent to participate in this study. The consent form was included in the envelope you received. If you wish to withdraw consent please do not return your materials. Questions should be directed to the primary author. Thank you so much for your participation in this study, we look forward to seeing you at OBTC and sharing our results.