

Training: Promoting Effective Teamwork in the College Classroom

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Abstract

The purpose of this study was the exploration relationships between student and faculty team training perceptions and student attitudes and behaviors. Faculty and students enrolled in interior design programs were selected to participate in the study and participants responded to a questionnaire administered. The findings suggest that team training is positively related to teamwork attitudes and team oriented behaviors. Findings also suggest that leadership training does not play a significant role. Helping students learn to be good followers and teammates may have a stronger influence on both attitudes and behaviors in the classroom. The findings related to instruction and team behaviors indicates that instructors should be very deliberate in their development of instructional objectives. When training is provided in a specific area, then a corresponding behavior increases in use.

Introduction

Can instructors help teams deal with issues in goal setting, decision making, problem solving, conflict management, power and leadership, and communication skills? Bento (1997) asks these questions in the development of a teamwork model. More importantly, perhaps, instructors should ask themselves why they do not teach teamwork skills in courses where collaborative projects are required. We do not expect students to appear in our classrooms already having mastered discipline specific knowledge. Teamwork can be just as, if not more, elusive.

Collaborative experiences are dictated by accreditation boards and recommended by professional advisory groups. However, if anecdotal accounts are to be believed, successful team experiences are more difficult to achieve than successful individual projects. Accounts of teams that have “fired” members or resolved differences via fistfights are certainly among the more colorful stories and most all university faculty members have his or her favorite story. Lawrence Halprin (1989, p. 128) proposes “that the techniques and processes that are required to lead or participate in a successful and rewarding collaboration be taught as part of our professional education and should become an integral part of our profession....throwing groups of people together and hoping

that enthusiasm alone will succeed is not enough.”

The purpose of this study was the exploration of several relationships concerning student and faculty team training perceptions. There are three objectives for this project: 1) compare student and faculty perceptions concerning the provision of classroom team training; 2) investigate the relationship between students' reported team training levels and students' reported team attitudes; and 3) investigate the relationship between students' reported team training levels to students' reported team behaviors.

Background

There is an extensive body of literature that addresses team work, collaboration, and cooperative learning in education and in professional practice. These studies address the general need for training, the impact of team training on student outcomes, time needed for effective training, and the role of process in training.

Existing literature indicates that training is a necessary component of teamwork. Bolton (1999) found that students indicated higher levels of satisfaction when team training was provided in class. Researchers investigating a variety of case study scenarios have concluded that team training activities are necessary (McCorkle et al., 1999; Berge, 1998; Lewis, 1997; Goodwin, 1999). Bangert (2001) and Cheng and Warren (2000) determined that careful training is necessary for peer assessments to be applied consistently and in an unbiased manner. These studies, among others, recommend preliminary training and continued coaching through all phases of team development and work progress.

Additional support for the need of team training is related to student outcomes. Significantly higher levels of perceived personal support and a more positive attitude was found for those with team training and experiences (Karsch, 2001). Students have reported more equitable share of work and higher perceived levels of team skills following a course in team building (Peterson, 1996). Students reported more time completing homework and almost half reported greater motivation as a function of the team training and process (Phipps, et al., 2001). These studies suggest student performance and attitudes are enhanced through team training.

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Training

Other researchers have established the importance of time spent in team development, training, and reinforcement in relation to successful team projects. Feichtner and Davis (1985) discovered that increasing the number of group projects throughout the semester led to more team cohesion and greater student satisfaction. Reinforcement activities and regular progress reports have enhanced student team performance (Dickson, 1997). Busseri (2000) found that midpoint evaluations addressing team behaviors from peers and instructor enhanced team processes and final outcomes. A study of a university faculty team indicates that time for the team to develop fully is necessary to success (Amey, 2000). The life cycle of a team, "forming, storming, and norming" (Robbins, 1995), has formed the foundation for other studies. Lewis (1997) states that knowledge of team stages and individual work styles can promote success. A transition from weekend projects to semester long projects allowed students to more successfully weather the stages of collaborative processes (Russ and Dickinson, 1999). Trust, shared vision, common language, and an understanding of individuals strengths and weaknesses contribute to a successful team; training and project timelines should facilitate this development.

The role of process in training and outcomes has been documented in a number of studies. Hillburn and Humphrey (2002) used a software program that forced teams into creating structure, goals, and a project plan. A project plan including schedules, individual responsibilities, and timelines has also proven effective (Dickson, 1997). Lerner (1995) uses personality profiles in class which prompts student groups to plan and develop team expectations. Conversely, students indicated that they wanted the instructor to provide project guidelines and due dates as well as team structure (Alexander and Stone, 1997); the authors suggest that students are accustomed to this type of guidance and have a difficult time acquiring those skills. Peterson (1996) found that students reported more equitable work distribution as a result of a clear process.

The literature supports the need for training as it relates to student outcomes and overall performance. Further, there is support for initial and reinforced training and adequate time for the team culture to develop. A clear process offered in training enables students to function more effectively. The literature review did not reveal findings that suggested training could or should be omitted.

Methods

Participants

Faculty and students enrolled in interior design programs were selected to participate in the study. Interior Design Educators' Council (IDEC) members were contacted by an email listserv for participation. Of the 423 faculty holding IDEC memberships, 251 belong to the listserv and 8% (n = 21) responded and agreed to distribute questionnaires to their. All students and faculty were eligible to participate as

long as they had completed one or more collaborative project in an interior design studio course.

Instrument

Following a literature review, pilot study questions were constructed around potential pitfalls in team activities. The pilot study was qualitative in form and addressed likes and dislikes about teamwork as well as pros and cons of team formation, training, team size, self- and peer-assessment, and project structure. The pilot study included 62 students from four interior design programs in four different states. Each student had participated in at least one team project. The qualitative answers were examined using content analysis.

The qualitative responses were used to create quantitative, scaled questions in the final instrument. These questions were constructed on a six-point scale and all items have the same direction: the higher the score, the greater the agreement with the statement. The faculty instrument inquired about demographics, common practices when developing a collaborative project, perceptions of student roles and practices on team projects, classroom leadership and teamwork training team formation methods, and peer evaluations. The student questionnaire included information about demographics, current team project involvement and experience quality, common roles and practices on team projects, classroom leadership and team training, team formation methods, peer evaluations, and best/worst experiences.

Design and Procedure

Following approval by the university's Institutional Review Board, questionnaires were mailed to the faculty. Instructions for administering the questionnaire were similar to course evaluations; the faculty member completed his/her instrument prior to class and placed it in the return envelope. When the instructor arrived in class, a student was asked to distribute and collect the student surveys and place into the return envelope and seal it. The faculty member left the classroom while students completed the survey. The instrument included information about informed consent and students who did not wish to participate simply returned his/her blank instrument to the envelope. Informed consent was inferred if the instrument was completed. The faculty member made arrangements for the envelope to be mailed back to the researchers. Fifteen faculty returned completed faculty questionnaires. Participating faculty requested 341 student instruments and 62% (n = 213) completed instruments were returned.

Analysis

SAS software was used to complete the data analysis. Canonical correlations have been utilized to explain the relation of two sets of variables. Canonical correlation is similar to a linear regression in that linear regression examines many-to-one relation-

ships and canonical correlation examines many-to-many relationships (Garson, no date). Variables with correlations of 0.3 or above are generally considered to be a contributing factor in the relationship. Eigenvalues represent the pooled RC2 and assess the extent to which one set of variables can be predicted or explained by the other set (Garson, no date). The significance level for all statistical tests was set at 0.05 and, when appropriate, p values varying from the preset level are discussed. Descriptive statistics were used to define participant characteristics and are summarized in Table 1.

Results

Objective 1

The data was examined to determine if faculty and students agreed upon provision of team training in the classroom. Means for student and faculty responses have been provided in Tables 2 and 3. Chi square analysis suggests that instructors were significantly more likely than students to indicate that training on effective communication, task division, conflict resolution, and the characteristics of a good team had been provided (Table 4). No significant differences were found between instructors and students concerning instruction on the qualities of a good leader or a good follower. There was also no significant difference between the two

research suggests that reinforcement activities enhanced student projects (Dickson, 1997). Faculty may introduce a topic but not offer opportunities to practice behaviors resulting in students' perceptions of inadequate instruction.

Objective 2

Canonical correlation was used to examine the relationship between students' perceived levels of team training and their teamwork attitudes. Given that the smaller of the two sets of variables contained eight variables, eight canonical correlations were generated, one of which was significant, $F(112, 930) = 1.54, p < .0006$, (Table 5). The pooled R_c^2 indicates that 59% of the variance between the two sets of variables can be predicted by this relationship. The findings suggest that team training focusing on the team (communication, role of follower, and characteristics of a good team) is positively related to positive attitudes toward teamwork.

Objective 3

Canonical correlation was used to examine the relationship between students' perceived levels of team training and resulting team behaviors. Eight canonical correlations were generated, two of which were significant (Table 6). The first canonical correlation, $F(96, 1283) = 1.66, p < .0001$, pooled $R_c^2 = .26$; indicates that 26% of the shared variance can be predicted by this relationship. A positive relationship was found between instructional components (how to be a good follower, how to divide tasks) and team behaviors related to fair workload. The second significant canonical correlation, $F(77, 1146) = 1.43, p < .01$, pooled $R_c^2 = .20$, indicates that 20% of the variance between the two sets of variables can be predicted by this relationship. These findings indicate a positive relationship between training related leadership and effective communication and proactive behaviors such as assuming leadership and addressing social loafing.

Table 1. Summary of Sample Demographics for Students

Characteristic	n	%	M
Gender			
Females	202	95	
Males	11	5	
Age ¹			23
Classification Level in College			
1 st Year	1	1	
2 nd Year	26	12	
3 rd Year	68	32	
4 th Year	97	46	
5 th Year	19	9	
Number of Team Projects Completed ²			3.6

¹Range = 19 – 45, Mode = 21

²Range = 1 – 19, Mode = 3

Conclusions

The findings suggest that team training is

groups concerning reading on teamwork or leadership. Students and faculty agreed that very little training or reading was provided in these areas. Findings suggest that faculty feel team instruction has been provided in several areas while students do not. One reason instructor and student response patterns may differ so significantly is that of reinforcement. Existing

Table 2. Means of Student and Faculty Scores for Perceived Levels of Team Training

Team Work. Please indicate how strongly you agree with each statement.

1 = Strongly Disagree; 6 = Strongly Agree

Instructional Component	Student			Faculty		
	M	SD	n	M	SD	n
In my design courses, I provide/receive instruction on						
What makes a good team	3.18	1.53	216	4.79	1.05	14
How to resolve conflict on my team	2.81	1.43	215	4.93	0.92	14
How to divide project tasks	3.28	1.36	216	4.71	1.38	14
How to communicate effectively with teammates	3.26	1.47	216	4.43	0.93	14
Assigned reading on teamwork	2.68	1.71	216	2.86	1.74	14
Characteristics of a good leader	3.15	1.66	216	2.93	1.59	14
How to be a good leader	3.09	1.65	216	3.14	1.74	14
How to be a good follower	2.74	1.55	216	3.14	1.75	14

Table 3. Means of Student Scores for Team Behaviors and Attitudes

Team Work. Please indicate how strongly you agree with each statement. 1 = Strongly Disagree; 6 = Strongly Agree

Team Behaviors	Student		
	M	SD	n
When I work on a team project, I usually			
Assume leadership of my team	4.08	1.23	215
Follow someone else's lead	3.08	1.35	214
Want everyone to have a vote	4.78	1.39	215
Assume leadership if no one else does	4.94	1.17	215
When there is disagreement on my team, I will			
Confront my teammate	4.03	1.43	216
Talk to my teammates and explain my concerns	4.83	1.07	216
Work to come to a consensus	4.96	.099	215
Talk to my instructor	3.69	1.59	216
When someone is not doing his/her share of the work, I will			
Work harder to make up for him/her	4.14	1.41	215
Report to my instructor	3.73	1.68	216
Confront my teammate	4.41	1.29	215
Find out if something is wrong	4.61	1.24	216
Team Attitudes			
I enjoy team projects.	3.73	1.28	217
I work my hardest because others depend upon me.	4.57	1.15	218
Team projects let me avoid the parts I am not good at.	4.08	1.39	217
Team projects let me avoid the parts that I don't enjoy.	3.73	1.38	218
Team projects allow me to work only on the parts that I enjoy.	3.29	1.38	218
Team projects force me to work on the whole project.	3.64	1.54	218
Team projects let some members not work very hard.	4.60	1.55	218
Team projects are fair in work load.	3.06	1.40	217
I do not enjoy team projects.	3.43	1.56	216
I enjoy having teammates to share the work.	4.34	1.33	218
My teammates push me to do my best.	3.92	1.31	218
I enjoy having teammates to share ideas with.	4.68	1.23	217

positively related to teamwork attitudes and team oriented behaviors. In the qualitative data collected as part of this study, students' comments may shed some light upon the quantitative findings. First, when asked why they enjoyed team projects, students suggested that teamwork was good because of the shared workload, shared ideas, and higher standards as a result of mutual dependency. Conversely, when students were asked why they did not enjoy teamwork, they cited lack of control, social loafing, and poor communication between team members. Clearly, these findings are reflected in the statistical results and suggest that training can shift student attitudes and behaviors from the negative to the positive category. By instructing students on the positive aspects of teamwork, students grow to realize that what they produce as a team is significantly

different from what they can produce as an individual.

The findings related to instruction and team behaviors indicates that instructors should be very deliberate in their development of instructional objectives. When training is provided in a specific area, then a corresponding behavior increases in use. Examples of this as demonstrated in the findings include leadership, communication, and task division. Instructional objectives, project outcomes, and assessment must mirror one another to be effective and accurate. For example, if students are to be assessed on how well tasks are divided and the quality of interaction between teammates, then training addressing task division and effective communication should be included as instructional objectives.

Findings also suggest that the emphasis on leadership does not seem to play the role that many might assume. Helping students learn to be good followers may enhance performance by emphasizing the important role each person plays on a team, may promote shared leadership and, therefore, shared responsibilities, and may increase their understanding of and appreciation for their teammates. Shared leadership may also be perceived more legitimately with appropriate training and assist students with control issues and social loafing.

The relationship between training and teamwork attitudes is significant. A positive attitude toward any classroom activity will open students' minds to new experiences and enhance learning. Frequently, students have had negative team

experiences and report they "always have to do someone else's work." One faculty member created scenarios featuring frequently occurring personalities such as the student who never shows up for a meeting, never shows up with assigned work, or never listens to others' ideas (Lerner, 1995). The scenarios allow students to create responses to these scenarios in anticipation for their own experiences. Not only did the students feel better prepared, but those who tended toward these habits were presented with a subtle opportunity for personal reflection. Instruction and the opportunity to practice skills related to positive team interactions can help each person feel more comfortable with the process.

Many factors affect students' performance in classes and especially on team projects. This study has several limitations that may impact the ability to generalize the findings. First, the sample size is

Table 4. Chi square results examining differences between faculty and student perceptions for instruction on types of team training

Group	Strongly Disagree 1	2	3	4	5	Strongly Agree 6	Chi-Square
In my design courses, I have received instruction on what makes a good team.							
Faculty	0%	0%	14%	22%	36%	29%	17.60**
Student	17%	22%	18%	22%	15%	7%	
In my design courses, I have received instruction on how to resolve conflict on team.							
Faculty	0%	0%	7%	21%	43%	29%	29.2***
Student	22%	25%	22%	17%	10%	4%	
In my design courses, I have received instruction on how to divide project tasks.							
Faculty	0%	7%	14%	21%	14%	43%	18.75**
Student	12%	19%	24%	27%	14%	5%	
In my design courses, I have received/provided instruction on effective communication.							
Faculty	0%	0%	14%	43%	29%	14%	13.46*
Student	14%	19%	23%	22%	14%	8%	
In my design courses, I have received/provided reading on teamwork							
Faculty	29%	21%	21%	0%	21%	7%	4.67
Student	35%	21%	15%	9%	9%	11%	
In my design courses, I have received/provided instruction on characteristics of a good leader.							
Faculty	21%	29%	7%	29%	7%	7%	2.92
Student	22%	18%	17%	19%	14%	11%	
In my design courses, I have received/provided instruction on how to be a good leader.							
Faculty	21%	21%	14%	21%	7%	14%	1.59
Student	25%	17%	16%	18%	16%	8%	
In my design courses, I have received/provided instruction on how to be a good follower.							
Faculty	21%	21%	14%	21%	7%	14%	1.83
Student	29%	21%	17%	17%	10%	6%	

*p<.05; **p<.01; ***p<.0001

Table 5. Canonical Correlation examining the relationship between students' perceived levels of team training and teamwork attitudes

Please indicate how strongly you agree with each statement. 1 = Strongly Disagree; 6 = Strongly Agree	Canonical Correlation 1 *
Training Measures	
In my design courses, I receive instruction on	
What makes a good team	0.40 ¹
How to resolve conflict on my team	-0.47
How to divide project tasks	-0.00
How to communicate effectively with teammates	0.49 ¹
Assigned reading on teamwork	-1.06
Characteristics of a good leader	0.43 ¹
How to be a good leader	-0.17
How to be a good follower	0.71 ¹
Team Attitudes	
I enjoy team projects.	-0.07
I work my hardest because others depend upon me.	-0.06
Team projects let me avoid the parts I am not good at.	0.24
Team projects let me avoid the parts that I don't enjoy.	-0.06
Team projects allow me to work only on parts I enjoy.	0.20
Team projects force me to work on the whole project.	0.32 ¹
Team projects let some members not work very hard.	-0.44
Team projects are fair in workload.	-0.57
I do not enjoy team projects.	-0.24
I enjoy having teammates to share the work.	0.34 ¹
My teammates push me to do my best.	0.30 ¹
I enjoy having teammates to share ideas with.	0.11

*F(112, 930) = 1.54, p<.0006, R_c² = .59

¹Contributes to the positive relationship between the two variable groups

relatively small and is limited to interior design majors. However, the sample represents 15 programs in 13 states across the United States. Additionally, the programs are located in human sciences departments, architecture programs, art programs

and colleges of agriculture; the philosophies of these programs do vary slightly as a function of administrative housing. Second, the sample is primarily female. Historically, enrollment in interior design programs has been skewed in gender distribution. Differences between males and females in both team work and especially leadership has been documented. The low number of males in this sample necessitates careful scrutiny.

Future research should seek out responses in similar disciplines such as architecture and landscape architecture. Additionally, more diverse disciplines such as business, engineering, and the sciences would lend a broader understanding to the pedagogical issues related to collaborative projects. A sample with more gender balance would also clarify these findings.

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Table 6. Canonical correlation examining the relationship between students' perceived levels of team training and resulting team behaviors

Please indicate how strongly you agree with each statement. 1 = Strongly Disagree; 6 = Strongly Agree	Canonical Correlation 1 *	Canonical Correlation 2**
In my design courses, I provide/receive instruction on:		
What makes a good team	-0.02	-0.65
How to resolve conflict on my team	-0.69	0.01
How to divide project tasks	0.89 ¹	-0.48
How to communicate effectively with teammates	0.16	1.08 ¹
Assigned reading on teamwork	-0.38	-0.09
Characteristics of a good leader	-0.26	-1.82
How to be a good leader	-0.42	1.99 ¹
How to be a good follower	1.23 ¹	-0.56
Team Oriented Behaviors		
When I work on a team project I usually		
Assume leadership of my team	-0.08	0.66 ¹
Follow someone else's lead	0.12	0.10
Want everyone to have a vote	-0.05	-0.14
Assume leadership if no one else does	-0.50	-0.37
When there is disagreement on my team, I will		
Confront my teammate	-0.64	-0.06
Talk to my teammates and explain my concerns	0.72 ¹	-0.76
Work to come to a consensus	-0.26	0.15
Talk to my instructor	-0.33	-0.49
When someone is not doing his/her share of the work, I will		
Work harder to make up for him/her	0.22	0.47 ¹
Report to my instructor	0.79 ¹	0.33 ¹
Confront my teammate	0.44 ¹	0.22
Find out if something is wrong	0.05	0.01

*F(96,1238) = 1.66, p<0001, R_c² = .26

**F(77, 1146) = 1.43, p<.01, R_c² = .20

¹Contributes to the positive relationship between the two variable groups

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