Enhancing Teams in Higher Education through Effective Team Dynamics Training

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Dr. Realff is a transformational leader with a passion for diversity, equity, and inclusion. She led efforts at Georgia Tech and in the American Society of Mechanical Engineers (ASME) to change policies and practices to increase diversity. She has been integral in setting organizational strategies across Georgia Tech, the National Science Foundation and the Center for Puppetry Arts. She served as the Vice President of Leadership and Diversity in ASME where the resulting policies and training have influenced the diversity and inclusion strategies of a wide range of professional societies. She has the energy to initiate and the dedication to sustain innovative education programs at the graduate, undergraduate and K-12 levels.

Dr. Realff is the founding director of the Effective Team Dynamics Initiative (ETD) which delivers on the vision that Georgia Tech will be a community where everyone's unique contributions are recognized. ETD cultivates a supportive, productive, and harmonious learning community grounded in strengths-based collaboration. Her operational leadership and strategic oversight has resulted in the initiative impacting 6500 undergraduate and graduate students and 1600 post docs, faculty, and staff in just the past five years. The initiative partnered with the Center for Teaching and Learning to develop the curriculum and train faculty and staff as certified facilitators to deliver its content. Dr. Realff has disseminated this program to other institutions. She directs an NSF sponsored grant in innovation in graduate education which draws on best practices in team work to develop leaders in engineering practice. She has revamped the MSE UG lab experience and MSE curriculum with an emphasis on integrating assessment and including post-doc and graduate student development.

Dr. Realff is a dedicated educator who listens to and advocates for students and has been honored for her teaching and mentoring at Georgia Tech. Her leadership and teaching excellence have been recognized through the Undergraduate Research Mentor Award, Atlanta Partners for Education Business School Partnership Award, CETL/AMOCO Junior Faculty Teaching Award, Outstanding Faculty Award, ANAK Award, CETL Educational Partnership Award, and MSE Faculty Teaching Award. Her service has been recognized through the ASME Dedicated Service Award and the Georgia Tech Diversity Champion Award. In 2007, she was named Fellow of ASME. She earned her B.S. degree in Textile Engineering at Georgia Tech and her Ph.D. in Mechanical Engineering and Polymer Science & Engineering at MIT.

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Abstract

At Georgia Tech, our Effective Team Dynamics Initiative (ETD) research has developed an integrated curriculum for student-to-student interactions as well as faculty training to help students set up teams for success and navigate challenging team dynamics. The materials include a curriculum guide with in-class and out-of-class activities and a facilitator guide that is used in the training-the-trainer effort. The curriculum has been integrated into a variety of courses where students were already working in teams including first-year seminar, junior design, and capstone design. **The objective of the work presented here was to implement and enhance team-training curriculum, to study the impact of this training** on learning objective attainment, understand if students would recommend this training to others, understand the course instructors' opinions around teams and team training, ascertain how course instructors experienced ETD in their classes, and determine if there was a difference between learning objective attainment when different facilitators conducted ETD sessions.

The summative assessment of the ETD undergraduate curriculum that was developed over the past five years showed that students report attainment of the learning objectives. Students (89%) indicated that they were equipped with a language to enable discussion of the diversity of strengths and experiences of their teammates and that they developed specific strategies for their team. Over 80% of students would also recommend the activities to other students. Over 90% of instructors indicated that ETD activities were useful to their students as they worked in teams. The ETD curriculum for undergraduate and graduate students has been implemented at other universities including Okinawa Institute of Science and Technology, Polytechnic University of Puerto Rico, and University of Texas Health Science Center at San Antonio, thus showing the transferability of the curriculum.

Introduction

The 2017 National Academies of Sciences, Engineering, and Medicines' report on *Undergraduate Research Experiences (URE) for STEM Students: Successes, Challenges, and Opportunities* makes over 50 references to teams and teamwork, such as the URE's tendency to "emphasize and expect collaboration and teamwork" [1]. The report does not contain systematic recommendations for team training among its numerous contributing sources. This absence may indicate that team training measures do not keep up with the increased curricular use of team projects. In fact, students are often required to work in groups without adequate preparation and guidelines for such interpersonal interactions [2-9]. The Accreditation Board for Engineering and Technology (ABET) requires the assessment of a student's ability to function effectively on a team [10];

however, many engineering programs do not specifically address team training as part of their curriculum. In the past five years, the Effective Team Dynamics Initiative and other researchers [11-16] have worked to fill this gap. For example, Jones et al. [13] gained an understanding of specific repeated behaviors that were more common in teams with negative and positive group environments and outcomes. However, there has been very limited research on how to model and then teach behaviors like those Jones et al. observed to students involved in group work. Lin and You [14] developed the Predicting Teamwork Performance system to identify functional roles automatically. In their work, students agreed (60%) that the strengths and role assignment system helped them cooperate with team members effectively and distribute the workload appropriately. Deemer et al. [12] studied how an energy science intervention caused an increase in leadership and teamwork, increasing the self-efficacy of students. Martin et al. [16] showed the importance of understanding justice through the teaching materials that they developed. They studied the impact of teaching students how to work effectively in teams for the problem-based learning intensive BS Biomedical Engineering program at Georgia Tech. A more formal curriculum to enable students to work effectively in teams and particularly one focused on team dynamics would therefore be useful.

At Georgia Tech, our Effective Team Dynamics Initiative (ETD) research has developed an integrated curriculum for student-to-student interactions as well as faculty training to help students set up teams for success and navigate challenging team dynamics [17-20]. The materials include a curriculum guide with in-class and out-of-class activities and a facilitator guide that is used in the training-the-trainer effort. The curriculum has been integrated into a variety of courses where students were already working in teams including first-year seminar, junior design, and capstone design. **The objective of the work presented here was to implement and enhance team-training curriculum, to study the impact of this training** on learning objective attainment, understand if students would recommend this training to others, understand the course instructors' opinions around teams and team training, ascertain how course instructors experienced ETD in their classes, and determine if there was a difference between learning objective attainment when different facilitators conducted ETD sessions.

Development of ETD

The Effective Team Dynamics Initiative (ETD) was founded in 2017 by Dr. Mary Lynn Realff. In the past five years, over 8,000 students and 1,500 faculty/staff have participated in the ETD training and curriculum. The growth of ETD was enabled by developing activities for different levels of students to meet the team training learning objectives. Expansion of the curriculum to numerous courses was possible through training a cohort of 14 instructors/facilitators to deliver the curriculum.

The Effective Team Dynamics Initiative's vision is to build communities where everyone's unique contributions are recognized. ETD cultivates a supportive, productive, and harmonious community grounded in strengths-based collaboration. ETD builds interdependent teams who work effectively through team challenges to obtain outcomes that are above those reached by individuals working independently.

ETD curriculum was developed by focusing on individual strengths instead of their weaknesses and builds a common language that leads to better self-understanding by asking, "Who am I?".

Further discussions focus on how an individual functions in a team: “How do I team?”. Then the students focus on “How do we team?” so that they can work more effectively together. Additionally, we build skills such as how to have effective conversations to work through team challenges. We also normalize talking about team dynamics. For example, senior design students reported that they “had some issues in the team and had to discuss their team dynamics” during the update meeting with the instructor.

The strengths-based language that we use is the CliftonStrenghs® for Students language. Gallup research has shown that employees and students who focused on their strengths are six times more likely to be engaged with their work [21]. A strengths-based approach at Georgia Tech has increased engagement and improved health and well-being by enhancing communication, fostering positive interactions, and focusing on what is right with our students and other members of our Georgia Tech community. We have anecdotally seen a change in the way people talk about themselves and their coworkers and will be testing this hypothesis in future research efforts.

The CliftonStrengths® language is heavily used in many of the activities and facilitations focus on developing strengths-based language to empower team members to work more effectively together. All facilitations are interactive and provide student participants with activities they can use as tools in future team settings. Initially, facilitations began in GT1000, which is Georgia Tech’s first year seminar course; facilitations soon expanded into introductory English courses, junior design, and senior design courses. Introductory courses such as GT1000, ENGL1101, and ENGL1102 give an introduction to individual strengths based on CliftonStrengths® for Students assessment results, strengths-based language, and activities that enable individuals to communicate what they bring and need from a team. More advanced courses, such as junior and senior design, build skills around conflict management by teaching students how to have respectful conversations when “opinions vary, stakes are high, and emotions run strong” [22].

All facilitations aim to address learning objectives for the Effective Team Dynamics Initiative Curriculum that were developed in collaboration with faculty in different departments. Effective teams are addressed in the syllabi of these courses such that the ETD learning objectives contribute to the attainment of the course learning objectives.

Student Learning Objectives

The ETD curriculum includes four major learning objectives which can be further articulated (see fully articulated sub-objectives in the supporting documents). Upon successful completion of the ETD curriculum, students will be able to implement strategies to improve team functioning and performance. Specifically, if students engage with the ETD activities at each level, by the time they graduate, they will be able to...

1. Leverage their knowledge, skills, strengths, and diversity and those of their teammates to develop innovative and inclusive approaches to global challenges.
2. Deploy effective communication strategies to manage collaboration and conflict within their team.

3. Devise a plan that manages team dynamics towards completing tasks that includes workload, responsibilities, quality of work, and timeline.
4. Observe and assess personal behaviors that contribute to team challenges, successes, and failures and those of their teammates. Compare and contrast their own assessment and that of their teammates to modify individual and the team's strategy.

Development of Instructors

The ETD curriculum also acts as a way to equip instructors with tools to develop their students' team skills. There are two primary tools to develop the instructors, including the train-the-trainer program and the Faculty Tool Kit [23].

Train-the-Trainer Program

The train-the-trainer program has allowed ETD to develop facilitators who can deploy the curriculum successfully at Georgia Tech and other universities. We have trained 16 facilitators to deliver the curriculum, some of which specialize in the delivery of individual modules. The train-the-trainer sessions occur over several weeks and begin with trainees experiencing the activity for which they are training as a participant and/or attending a student session as an observer. This experience is followed by a detailed discussion about how the activity was designed, techniques for session facilitation, and navigating difficult questions or situations that may arise. Finally, trainees practice delivering the session to each other in "teach-back" mode. After this training, the newly-trained facilitator leads their first student session. This session is attended by an experienced facilitator who can aid the new facilitator if they have questions during the session and will provide the new facilitator with feedback following the session. Through our funded research program, ETD has been able to train two to four new facilitators each year.

Faculty Tool Kit

In addition to the train-the-trainer program and undergraduate student curriculum, we have developed a Faculty Tool Kit, Figure 1. The ETD Faculty Tool Kit equips faculty so that they can help their teams work effectively together. It is also designed to build team skills that have been shown to decrease the likelihood of team conflict.

The tool kit is designed like a first aid kit, with some contents aimed at prevention of debilitating conflict and others aimed at treatment. Each of the recommended tools for prevention, diagnosis, and treatment are described, including necessary materials and suggestions for increased effectiveness. For example, the prevention tools focus on the health of individuals, the team, and the team objective. The goal is to reduce and minimize major conflict and team member discrepancies by educating team members on their strengths, "pressure points," and areas of concern. The diagnosis tools focus on the process of determining which underlying team effectiveness issues or conditions are impacting a team. These tools help separate the symptoms from the root cause of a team's effectiveness. Lastly, the treatment tools are often used in cases of debilitating conflict and are not intended to address relatively minor conflicts. These tools require careful facilitation by faculty and/or teaching assistants since the implementation may require difficult conversations with team members.

The tools were developed with instructors who have since used these tools successfully in their classrooms and offices (Figure 2). The tools are designed for a wide variety of courses and teaching styles. It is not expected that instructors will use all of the tools in any given course. Although the kit contains seven different tools with variations offered for many of them, we have found that each instructor that uses the tool kit will use one or two of the tools most frequently. For example, one of the Vertically Integrated Project (VIP) teams at Georgia Tech has fully implemented the five-finger pulse check that is suggested for use to get instant feedback from members of a team about their confidence and comfort levels. The VIP team has used the tool in their team discussions to help normalize talking about team dynamics and setting expectations for the team. Other tools include "Spotlight Cards" used to develop communication between team members and identify point of future conflict, "Application of Strengths" used in the early stages of team formation to guide discussions about each student's role on the team and how all members can work together to prevent future conflict, "Peer Evaluation" used to interpret peer evaluation results and identify red flags in team ratings, "Poll Everywhere" used to get anonymous feedback from the members of a team and can be used for multiple teams at one time, "Team Dynamics Cards" used to highlight each team member's perceptions of the conflict occurring on their team. "Spotlight Cards" are also used as a treatment tool to incite honest communication about disproportionate effort among team members and/or to improve areas of conflict. The Faculty Tool Kit manual includes a list of materials needed for each tool, how to use the tool, how to debrief the tool activity, and recommendations for follow-up after using the tool.

Figure 1: Effective Team Dynamics Faculty Tool Kit.

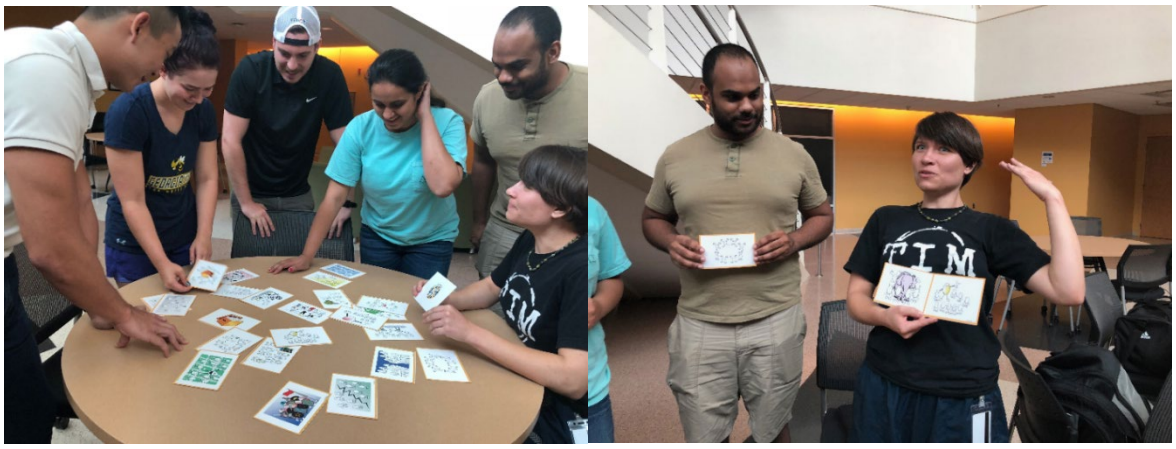

Figure 2: Students use the Team Dynamics Cards to describe their perception of the team dynamics, to talk about potential challenges, or to work through an existing challenge.

Study of ETD impact on Student Learning

The focus of this study was to evaluate the effectiveness of ETD facilitations in GT1000/2000, ENGL1101/1102, and CS Junior Design courses during the fall 2022 semester at Georgia Tech.

Assessment Methodology

Students and instructors were surveyed about their experience with ETD facilitated sessions. Student survey questions were developed to assess learning objectives associated with ETD curriculum. Testing of the survey was conducted during spring 2022 to solicit feedback about the comprehension of the questions. Surveys were administered on paper and electronically to gauge which format of the survey yielded the highest response rate.

Based on the learning objectives and activity content of each facilitation, a course specific electronic survey was developed. Survey questions are formatted on a Likert Scale to assess whether a participant strongly agrees, agrees, neither agrees or disagrees, disagrees, or strongly disagrees with the given statement. The survey also asked whether the student took the CliftonStrengths® assessment prior to their facilitation.

Facilitations were conducted in 39 course sections by three strengths coaches and one undergraduate student. Depending on individual course length, facilitation ranged from 50 minutes to one hour and 15 minutes; 40 minutes of pre-work were assigned and expected to be completed before the facilitations. At the conclusion of the facilitation, the instructor displayed a QR code to access the survey that was delivered via Microsoft Forms. Students were prompted with a consent survey that details that they must be over 18 to complete the survey. Results were kept anonymous, and participation was highly encouraged but not required.

Instructor survey questions were developed to assess their attitudes towards teaching teamwork skills, their role in preparing teams, and the usefulness of the ETD sessions for their students.

Student Data

In total, 669 student survey responses were collected. Survey responses with two or more questions left unanswered were removed from the dataset. Twelve responses fell into this category, leaving 657 responses for the data set. Survey responses were coded to numeric values according to the normal five-point Likert scale.

The survey was administered at the conclusion of each ETD session, and the results were timestamped. Although the responses are anonymous, the timestamp indicates which session the respondent participated in. To determine if student responses were dependent on the facilitator/instructor, the data was organized by facilitator/instructor (Appendix B). An ANOVA test was used to determine if there was a statically significant difference between student responses for the three facilitators/instructors for each of the six statements in the survey. There is no significant difference in student responses for the three session facilitators/instructors.

The response rate of students in large classes was lower than that for students in small classes (Figure 3).

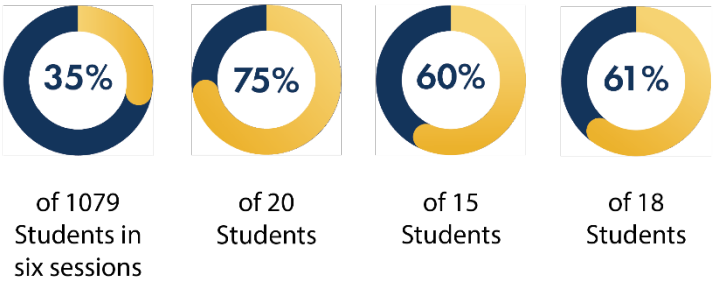

Figure 3: Response rates for large classes (1,079 students in six sections) was lower than those of small classes (15-20 students per section).

Students were asked to rate their agreement with six different statements.

Statement 1: The pre-work prepared me for the in-class discussion.

Statement 2: This session equipped me with a defined and common language by which a team could discuss the various skills and strengths of different members.

Statement 3: This session aided my ability to discuss team strengths and skills with a view to developing specific and helpful strategies for my team.

Statement 4: This session helped me to reflect on past team experiences.

Statement 5: I learned to reflect on previous experiences to create better teamwork strategies.

Statement 6: I would recommend the Effective Team Dynamics activities to other students in teams in classes or student organizations.

As shown in Figure 4, 89% of students agreed that they were equipped with a language to enable discussion of the diversity of strengths and experiences of their teammates (Statements 2 & 3). Over 71% of students who experienced the ETD activities that were integrated into their class, agreed that they were able to develop new and useful strategies and reflect on past team experiences in the course (Statements 4 & 5). Additionally, 81% indicated that they would recommend these ETD activities to future classmates or student organizations (Statement 6). Averaged scores when the data is mapped to a 1-5 scale are shown in Figure 5.

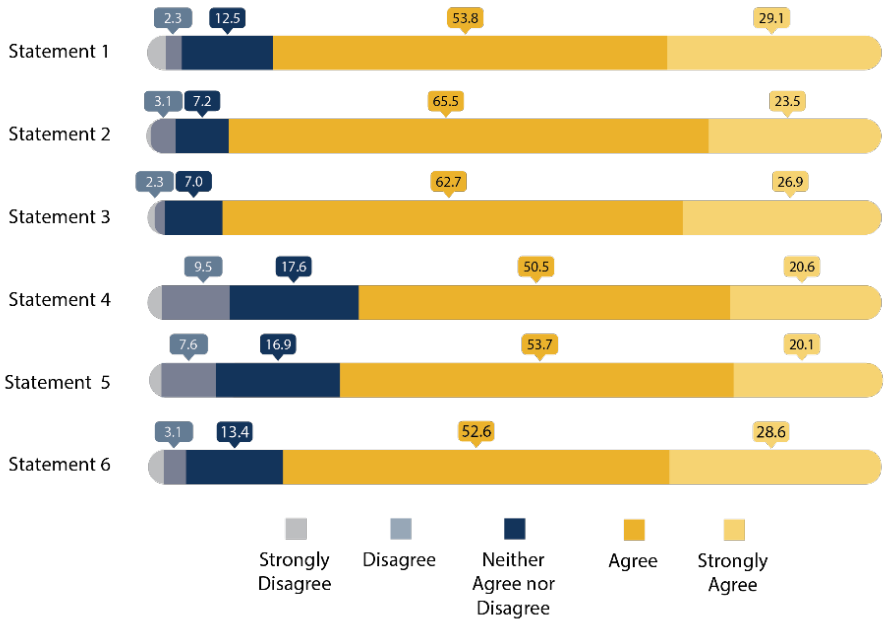

Figure 4: Percentage of individual student responses.

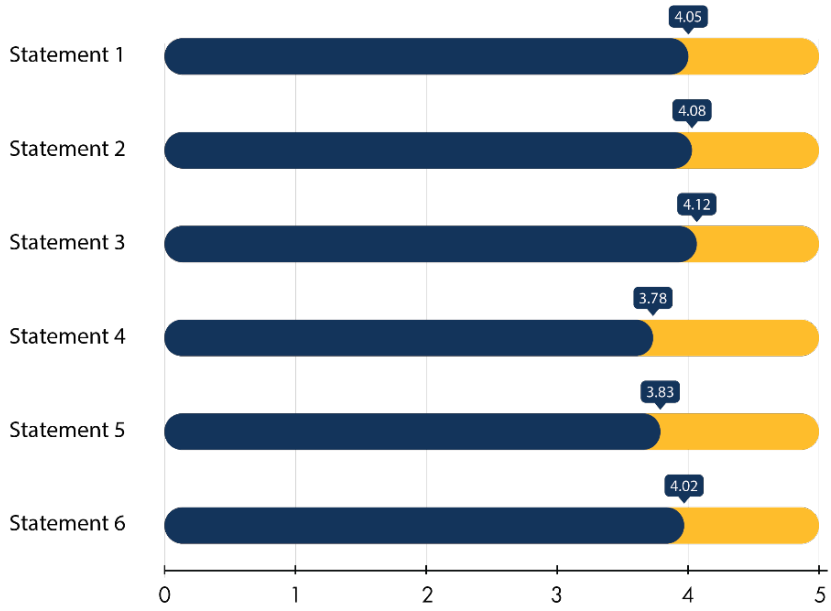

Figure 5: Average scores of student responses.

We were interested in the students' perceptions of the pre-work and also if doing or not doing the pre-work impacted the results of the other responses to the survey. We noticed there were frequently a few students who did not complete the pre-work and, as a result, developed an alternate way for those students to participate in the class discussion. By looking at the student responses when separated into groups of students who did and did not finish the pre-work, we found that the answer to Statement 1, "the pre-work prepared me for the in-class discussion," varied (Figure 6). However, the responses to the other statements were not significantly different between the two groups. Students self-reported about completing the pre-work, and we did not keep a tally of how many students completed or did not complete the pre-work. In talking to the instructors, we found that some instructors assigned the pre-work as a class assignment, while others asked students to complete it and show up for class with the pre-work. At this point, we cannot make a conclusion about the necessity of the pre-work on students meeting the learning objectives.

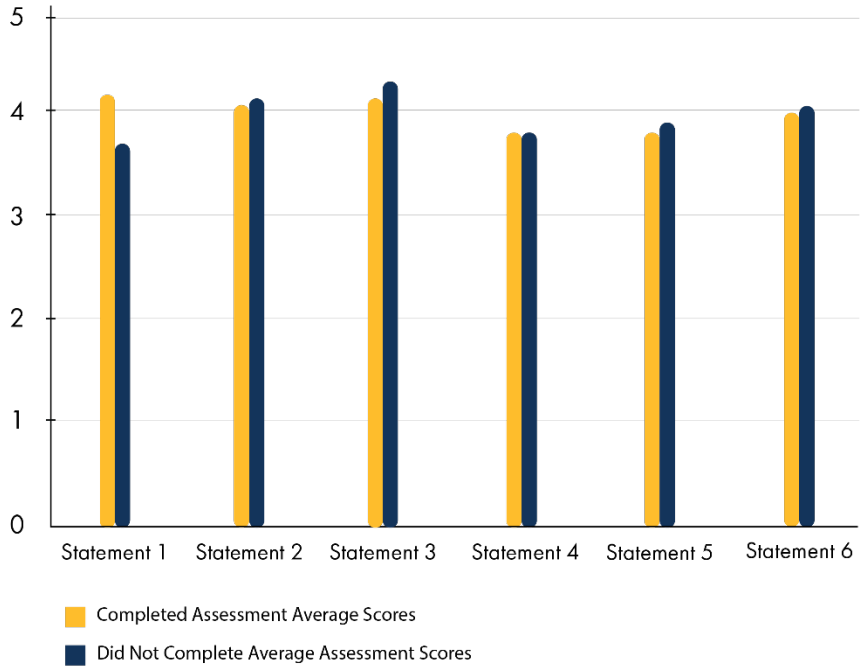

Figure 6: Average scores for students that completed CliftonStrengths® pre-work and students who did not complete the pre-work.

Instructor Data

Instructors who included ETD curriculum activities in their course were asked to rate their agreement with four different statements.

Statement 1: The ETD/Strengths activities were useful to my students as they worked in teams last semester.

Statement 2: Students need guidance from instructors in order to learn how to excel at working in a group.

Statement 3: I believe that students in [my course] should develop skills to work more effectively in teams.

Statement 4: Personally, I feel more comfortable working in groups than working alone.

Statement 5: The ETD/Strengths activities will be useful to me as I work in teams in the future.

Instructors indicated that they saw a decrease in the number of teams that were unable to navigate team dynamics challenges they encountered. Instructors fully agreed that their students should develop skills to work more effectively in teams (Statement 3). Instructors (92.3%) also indicated that the ETD activities were useful to their students as they worked in teams (Statement 1). One

surprising finding was that only 38.5% of instructors indicated that they themselves were "more comfortable working in groups than working alone" (Statement 4), but 92.3% of instructors agreed that "students need guidance from instructors to learn how to excel at working in a group" (Statement 2). Although surveyed instructors overwhelmingly believed that students need guidance to successfully complete groupwork, instructors who themselves do not feel comfortable working in teams may not be best suited or equipped to deliver team training in their classes without external resources. There is some evidence that instructors also benefit from the team training themselves since 76.9% believed the ETD/Strengths activities would be useful as they work in teams in the future (Statement 5). Increasing the instructors' knowledge of techniques to aid teams in conflict resolution, workload division, leveraging strengths, etc. through active observation of the ETD facilitated session may help them feel more comfortable delivering team training to their students in future classes. See Appendix B for results.

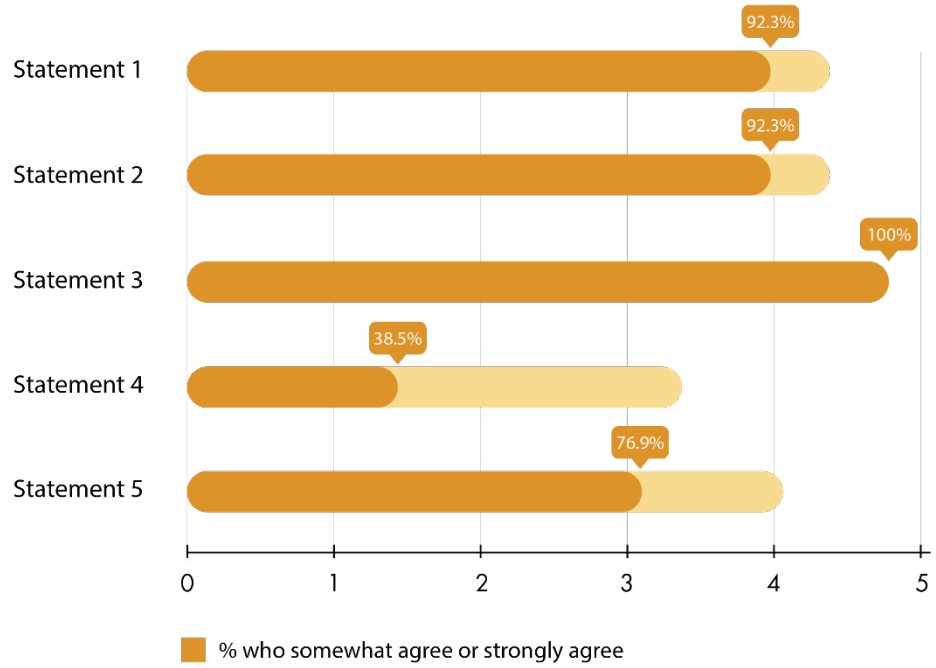

Figure 7: Instructor opinion survey responses about ETD activities integrated into their course.

Conclusions and Future Work

Success of the ETD Initiative

The data demonstrates that Effective Team Dynamics facilitations are successful in equipping participants with a common strengths-based language, encouraging students to discuss and develop strategies with their teams, and reflect on previous team experiences to improve future work. Student participants have indicated that ETD facilitations make a positive impact on their teamwork journey and have shown enthusiasm and satisfaction with the skills they take away from

sessions as indicated in their willingness to recommend it to classmates or in student organizations. Instructors indicate the need for equipping teams and usefulness of the ETD sessions.

The development of instructors through the train-the-trainer program and Faculty Tool Kit has allowed the ETD program to grow and support the increasing instructor requests for equipping teams in their classrooms. The train-the-trainer program gives a direct route of instructor involvement, training instructors to facilitate the ETD curriculum in their classroom. This initiative is supported by the uniformity of the outcomes of the instructors and by the successful implementation of ETD at other universities. The Faculty Tool Kit has created a broad impact, allowing instructors to choose tools that most closely align with the goals of their classroom. It acts as a pre-planned and customized system for creating effective teams of students.

While the current study demonstrates that ETD facilitated sessions have a positive impact on students and achieve their specific ETD learning objectives, there are improvements that will be made for future surveys.

Improve Response Rates

First, the response rate for the survey was less than ideal with the top responses rate being ~75% for a course with 20 students and lowest being ~35% for a course with 1,079 students taught in six sections. ETD facilitations are designed to be delivered in a 50-minute period, but instructors left only one minute at the end to solicit responses. In the future we will give respondents more time at the end of the session to complete the survey. Additionally, responses were gathered on an anonymous volunteer basis, so researchers could not follow up with students who did not answer the survey to solicit their response. Future plans will include a follow up with all students requesting their input via the survey. In some sessions, students reported connectivity issues or did not have a device due to the discussion-based nature of facilitations that use printouts rather than electronic worksheets. We are not sure how to address this issue and hope that the planned follow up will solicit input from students who were unable to complete the survey in class.

Clarification of Pre-work Assignment

A second improvement would be clarifying the definition of "pre-work" in Statement 1. Table 5 indicated that students who did not complete pre-work still answered Statement 1 with answers other than "neither disagree or agree" due to the average score being 3.70 rather than 3.00. Students could have mistakenly believed that reading the short definitions of the 34 CliftonStrengths® themes before class counted as pre-work, when in actuality, reading their individual CliftonStrengths® report was the assigned pre-work.

Expansion of the Work

This work did not include the gathering of demographics of the survey respondents since the demographics of the class could be gathered by other means; however, the response rates obtained does not allow us to assume that the demographics for the class are the same as the demographics of the respondents. Including optional demographic questions could be added to the survey so that analysis can be done to see if the experiences of students vary with demographics.

Future work will include gathering more data on learning objective attainment in all of the courses where ETD sessions are integrated. ETD has developed a well-being course, APPH1060: Flourishing: Strategies for Well-being and Resilience, based on an expansion of our undergraduate curriculum. This course fulfils the well-being requirement for all Georgia Tech students and includes assignments where students write reflections about their well-being, resilience, strengths, and experiences. These reflections will be evaluated to determine how the student's language changes over time as they gain knowledge and skills through course activities.

Acknowledgements

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Appendix A: Student Learning Objectives with sub-learning objectives

The ETD curriculum includes four major learning objectives which can be further articulated. Upon successful completion of the ETD curriculum students will be able to implement strategies to improve team functioning and performance. Specifically, if students engage with the ETD activities at each level, by the time they graduate, they will be able to...

1. **Leverage their knowledge, skills, strengths, and diversity and those of their teammates to develop innovative and inclusive approaches to global challenges.**
    a. Understand how different perspectives can be utilized for global challenges.
    b. Develop a common language to discuss knowledge, skills, and strengths within the team.
    c. Integrate an individual and their teammates' knowledge, skills, and strengths to develop inclusive teamwork (collaboration) strategies.
    d. Understand different ways individuals can influence and contribute to the team.
2. **Deploy effective communication strategies to manage collaboration and conflict within their team.**
    a. Identify communication strategies useful for team collaboration.
    b. Implement effective communication strategies that fit specific team needs.
    c. Understand different conflict management styles and identify them within one's team.
    d. Evaluate conflict within one's team and utilize appropriate communication and conflict management strategies.
    e. Translate poor teamwork experiences into actionable strategies to prevent team conflict.
3. **Devise a plan that manages team dynamics towards completing tasks that includes workload, responsibilities, quality of work, and timeline.**
    a. Identify team norms and teammates' goals for the project.
    b. Understand how to assess the workload and responsibilities necessary for the project.
    c. Discuss expectations: division of responsibilities, timelines, and quality of work.
    d. Create guidelines for how quality of work will be assessed.
    e. Describe different models of leadership that apply to teams.
    f. Apply appropriate model of leadership that fits team needs.
4. **Observe and assess their behaviors that contribute to team challenges, successes, and failures and those of their teammates. Compare and contrast their own assessment and that of their teammates to modify their own and the team's strategy.**
        a. Identify individual and teammates' contributions to task work and teamwork that lead to team challenges, successes, and failures.
        b. Appraise teammates behaviors objectively.
        c. Incorporate feedback to improve individual and teammate contributions.
        d. Evaluate the effectiveness of current leadership models within the team and make changes as needed.

Appendix B: Details on the Data Analysis

Student responses to the survey deployed at the end of the ETD session in their class showed that the majority of students felt that they made progress with ETD learning objectives. Statement 3 about giving students the "ability to discuss team strengths and skills with a view to developing specific and helpful strategies" scored the highest overall. The average score was 4.12 with 89.6% of students answering "agree" or "strongly agree." Students also felt strongly that sessions equipped them with a common language to discuss strengths, indicated by an average score of 4.08 (standard deviation of 0.70). For the net promoter score (Statement 6), 81.2% of students would recommend an ETD facilitation to their peers, with 13.4% remaining neutral on this statement giving an average score of 4.02. No average score fell under 3.00 to the disagree region, indicating that the majority of students felt that they made progress with ETD learning objectives.

The lowest scoring questions (Statements 4 & 5) about reflecting on past team experiences and learning to use past experience to improve future strategies received average scores of 3.78 and 3.83 respectively. Additionally, both of these statements saw the largest percentage of students remaining neutral with 17.6% and 16.9% selecting "neither agree or disagree," respectively. During the facilitation, students are prompted to discuss past team successes and difficulties with their team for a short period of time. Some students elect to discuss experiences they have had with academic organizations and others broaden the discussion to any team such as a sporting group. A high neutral response for these statements, especially the first about solely reflecting on team experiences, was unexpected given that a designated period is given to discuss these prompts. This may warrant more research to gain a better understanding of the student experience during this part of the facilitated session.

Table 1 displays survey statements included in the student survey. Their responses were coded to a value one to five corresponding to Likert scale ratings. The average score was generated by summing the scores for each statement and diving by the number of students who completed the survey.

Table 1: Student Survey: Average Scores and Standard Deviations per Statement on a 5-Point Scale

Statement	Average Score	Standard Deviation
1. The pre-work prepared me for the in-class discussion.	4.05	0.85
2. This session equipped me with a defined and common language by which a team could discuss the various skills and strengths of different members.	4.08	0.70
3. This session aided my ability to discuss team strengths and skills with a view to developing specific and helpful strategies for my team.	4.12	0.72
4. This session helped me to reflect on past team experiences.	3.78	0.94
5. I learned to reflect on previous experiences to create better teamwork strategies.	3.83	0.84
6. I would recommend the Effective Team Dynamics activities to other students in teams in classes or student organizations.	4.02	0.87

Table 2: Student Survey: Percentage of Each Response Given per Statement

Statement	Strongly Disagree (%)	Disagree (%)	Neither Agree or Disagree (%)	Agree (%)	Strongly Agree (%)
1. The pre-work prepared me for the in-class discussion.	2.4	2.3	12.5	53.8	29.1
2. This session equipped me with a defined and common language by which a team could discuss the various skills and strengths of different members.	0.8	3.1	7.2	65.5	23.5
3. This session aided my ability to discuss team strengths and skills with a view to developing specific and helpful strategies for my team.	1.1	2.3	7.0	62.7	26.9
4. This session helped me to reflect on past team experiences.	1.9	9.5	17.6	50.5	20.6
5. I learned to reflect on previous experiences to create better teamwork strategies.	1.7	7.6	16.9	53.7	20.1
6. I would recommend the Effective Team Dynamics activities to other students in teams in classes or student organizations.	2.3	3.1	13.4	52.6	28.6

Table 2 gives the percentage breakdown of responses for each statement. As the data demonstrates, the majority of responders agree with each statement.

We were interested in looking at the effectiveness of our train-the-trainer efforts. To get one measure of this, we looked at the correlation between instructor/facilitator and student responses for three different instructors/facilitators (Table 3). ANOVA testing of the difference in mean scores for different instructors that facilitated sessions showed that there was no significant difference in the student responses (Figure 8). It appears that facilitator/instructor did not impact student achievement of learning objectives. Instructor 3 had lower average scores, but the p-value of 0.844 confirms that this slight decline was not significant overall. Instructor 3 was a student who was just beginning their facilitation career. Instructors 1 and 2 are seasoned instructors who have facilitated in several courses over the span of five and three years, respectively. The elevation in scores here is likely attributed to instructor experience with engaging students rather than the content of facilitation itself. ETD has developed detailed facilitation packets and slide decks that include a script for each session. While instructors do not follow the script verbatim, all instructors receive extensive training that includes experiencing the session themselves, learning tips from experienced facilitators, and doing teach-backs to practice their own facilitation of the materials. They are instructed to present with slide decks of uniform content to teach the appropriate learning objectives for the facilitation level. The format for the facilitation guides were developed based on a variety of training materials including those from the CliftonStrengths® and Crucial Conversations facilitation guides. Content of the guides includes thumb nails of the slide decks, timing, frequently asked questions, tips for facilitation, and room set up.

Table 3: Student Survey: Response Average Scores for Three Instructors

Statement	Instructor 1	Instructor 2	Instructor 3
1. The pre-work prepared me for the in-class discussion.	4.08	3.98	4.16
2. This session equipped me with a defined and common language by which a team could discuss the various skills and strengths of different members.	4.08	4.10	3.91
3. This session aided my ability to discuss team strengths and skills with a view to developing specific and helpful strategies for my team.	4.14	4.11	3.95
4. This session helped me to reflect on past team experiences.	3.75	3.79	3.89
5. I learned to reflect on previous experiences to create better teamwork strategies.	3.78	3.88	3.95
6. I would recommend the Effective Team Dynamics activities to other students in teams in classes or student organizations.	4.01	4.08	3.82

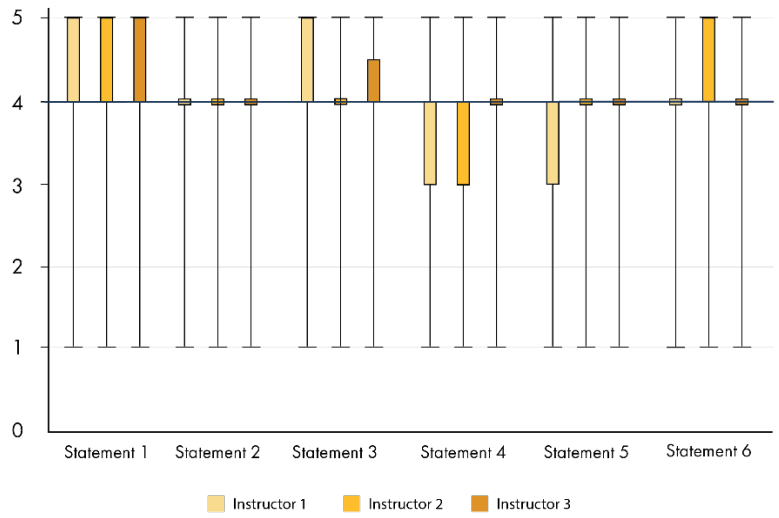

Figure 8: Box and whisker plot of ANOVA test data indicating that there was no significant difference between the student responses based on session instructor/facilitator.

Table 4 addresses completion of the pre-facilitation CliftonStrengths® assessment "pre-work" and compares survey results to those who did complete the assessment. The assessment takes approximately 30 minutes to finish and must be done in a single seating. If students show up for the facilitated session and have not completed the CliftonStrengths® assessment, they are given a list of descriptions for all 34 themes and are asked to select five to work with before the facilitation begins. This enables them to have the conversations with their classmates, and they are encouraged to complete the assessment after the session. The average scores for those who did not complete the assessment followed the same trend as those who did, with Statement 3 scoring the highest (4.30) and Statement 4 the lowest (3.78). When utilizing the standard alpha value of 0.05, a T-test indicates that only a score difference for Statement 1 was significant with a p-value of 0.0029. Logically, these results agree as Statement 1 was asking about usefulness of the pre-work.

Table 4 demonstrates the variance in average scores depending on completion of the CliftonStrengths® assessment prior to facilitations. A majority of students completed the assessment within a two-week window prior to the session with a small minority completing it over a month in advance of the session.

Table 4: Student Survey: T-Test to Compare Students Who Completed Pre-Work and Those Who Did Not

Statement	Completed Assessment Average Scores	Did Not Complete Assessment Average Scores	P-Value from T-Test
1. The pre-work prepared me for the in-class discussion.	4.17	3.70	~0.00
2. This session equipped me with a defined and common language by which a team could discuss the various skills and strengths of different members.	4.07	4.15	0.08
3. This session aided my ability to discuss team strengths and skills with a view to developing specific and helpful strategies for my team.	4.14	4.30	0.27
4. This session helped me to reflect on past team experiences.	3.80	3.78	0.92
5. I learned to reflect on previous experiences to create better teamwork strategies.	3.80	3.89	0.60
6. I would recommend the Effective Team Dynamics activities to other students in teams in classes or student organizations.	4.00	4.07	0.08

Table 5: Instructor Survey: Average Score on a 5-Point Scale and Percentage of Each Response Given per Statement

Statement	Average Score	"Somewhat Agree" or "Strongly Agree" (%)
1. The ETD/Strengths activities were useful to my students as they worked in teams last semester.	4.31	92.30%
2. Students need guidance from instructors in order to learn how to excel at working in a group.	4.31	92.30%
3. I believe that students in [my course] should develop skills to work more effectively in teams.	4.77	100.0%
4. Personally, I feel more comfortable working in groups than working alone.	3.31	38.50%
5. The ETD/Strengths activities will be useful to me as I work in teams in the future.	4.08	76.90%