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**BUILDING A COMMUNITY AMONG ENGINEERING STUDENTS**

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Abstract: All Construction Management and Civil Engineering Technology (CMCE) students at City Tech are required to complete Statics as a prerequisite to their Design Courses. Grade distributions over the past decade indicate that only about 53% of students pass Statics with a grade of C or better. PLTL is in its third semester of implementation and data indicates that the students in the PLTL inclusive Statics classes are performing better than those in sections without PLTL. The success of PLTL is due to workshops creating a sense of community among our diverse student population. The diversity in the classroom has a natural tendency to divide the students into “cliques” and discourages them from working together or asking peers for help. PLTL works against the natural tendencies and encourages students to overcome their differences and work as a community towards a common goal.

The Department of Construction Management and Civil Engineering Technology (CMCE) of New York City College of Technology (City Tech) offers Associate degree programs in Civil Engineering Technology (CV) and Construction Management Technology (CM). An introductory course taken by freshmen in the CMCE Curriculum is Statics, CMCE1104, which provides an introduction to the basic theory necessary for structural analysis and design, including the concepts of force, stress, strain and equilibrium (College Catalog, 2011-2013).

Statics is known as the “make it or break it” course in the curriculum; performance in this course is indicative of performance in all CMCE design courses. Grade distributions in the department over the past decade indicate that only about 53% of students pass Statics with a grade of C or better (AIR, 2013). First semester courses tend to be more difficult because students tend to rely on study methods which worked for them in high school but may not be effective in a college-level course.

Statics requires students to have the ability to apply concepts of algebra and trigonometry. About 45% of students at City Tech fail the math placement exam; students failing the placement exam may enroll in the CMCE major as long as they fulfill the remedial requirements prior to the completion of 12 credits. Students with inadequate knowledge of basic math principles struggle with the Statics course.

Peer Led Team Learning is an innovative learning technique whereby students participate in weekly workshops. Workshop modules are created by faculty and consist of challenging problems based on the weekly lectures. Students work in small groups under the guidance of a Peer Leader to complete the modules.

Peer Leaders are students who have successfully completed the course and have decided to take on a mentoring role for their peers. At City Tech, Peer Leaders complete a one-credit course in Peer Leader Training as well as attending weekly leadership seminars. Peer Leaders learn to lead a group of students by focusing on communication, group dynamics, motivation, learning styles, and other process issues in order to help participants actively engage with course material (College Catalog, 2011-2013).

### Method

PLTL was implemented in CMCE 1104 in the spring of 2012 and has been running for three semesters. The organization of the workshop has evolved from in-class embedded 45-minute long workshops with the professor present to a one-hour workshop outside class time where the professor is not present. The workshops are led by the Peer Leaders and students must attend a minimum number of workshops throughout the semester as part of the course requirements.

### Demographics

The sections in the study include students enrolled in CV and CM majors. In the spring 2013 semester, the student profile for CMCE students was 51% enrolled Part Time, 49 % enrolled Full Time; 9% Female, 91% Male. The breakdown by race was 11.4% Asian or Pacific Islander, 28.6% Black, 26.5% Hispanic, and 30.9% White (AIR, 2013).

### Results

Over the last decade, only about 53% of the students passed CMCE 1104 with a C or better. . Since implementation of PLTL in a number of 1104 sections, the percent passing with a C or better in the PLTL inclusive sections (without the professor present) for the Fall 2012 and Spring 2013 were 59% and 68% respectively. The pass rates are higher overall in the PLTL inclusive sections. In addition, the PLTL inclusive sections have lower withdrawal and failure rates compared with the rate of the college overall.

### Discussion

The workshop modules provide students with challenging real world problems. Students learn to depend on their peers and feel a sense of responsibility, or accountability to their peers. The workshops focus on educational success; however the groups are developing relationships. All students feel like they matter, each individual is a critical component of the group (Schlossberg, 1989) .

Peer Leaders develop a sense of leadership, dependability and self-value. The presence of the leader is critical to the success of the workshop (Roth, Goldstein, Marcus, 2001). Leaders are responsible for guiding their peers but also for the assessment of the group and its members. Leaders must ensure that the workshops are effective or they need to explore new techniques.

The main dividing factors among students are language/culture and gender differences. Non-native English speakers tend to be quiet and reserved; at times it is difficult for the professor to decide whether non-native speakers understand the concept, much less the language. Females tend to be quiet and prefer to work independently. Female students are less likely to question a Peer Leader or Professor.

International students or non-native English speakers have more difficulty understanding the material because of the language. The workshop provides an opportunity for the non-native English speakers to gain confidence and improve their communication skills. Students feel more comfortable asking questions and bringing up topics for discussion in the workshop environment. Everyone in the group knows each other and students find it easier to relate to Peer Leaders because they are students as well. Peer leaders encourage students to pose their questions and to explain their solutions to the group. Peer leaders are responsible for creating a workshop atmosphere that breaks down barriers and promotes a safe and comfortable environment. Students should feel comfortable in the workshop, everyone present is there to learn, working towards a common goal, to do well in the course.

The workshop experience creates a sense of community. A community as defined by the Merriam-Webster dictionary is an interacting population of various kinds of individuals (as species) in a common location. The workshop breaks down barriers and students are actively involved working together regardless of differences. The PLTL Community mirrors the real world; we have diverse student groups working to solve a common problem. As future Engineers and Construction Managers, they will be required to work with large design teams composed of individuals with different responsibilities, priorities, and cultures.

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