



## **First-year Engineering Student Expectations and Experiences: Community, College, and Curriculum**

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## **Abstract**

This is an evidence-based practice paper whose purpose is to analyze the impact of service-learning in a first-year engineering course on students who choose to enroll in these sections. The paper will also look at the level of engagement the students experience and their connection to an urban community. Past literature revealed that students understand an engineering design process better when the practice is implemented in a service learning environment. The focus of this research is to see if these findings hold true at Northeastern University, if service learning efforts have enhanced or detracted from students' engineering education as a whole in comparison to their non-service learning peers, and if the practices and outcomes of these sections create new trajectories and plans for students, specifically whether it enhances future involvement in community outreach efforts.

## **Introduction**

Northeastern University is a top fifty university [1] located adjacent to the Roxbury neighborhood of Boston, Massachusetts. Thanks to exponential growth and development over the last decade, Northeastern has become a landmark within the community. For decades, it has been shaped by its urban backdrop and has recently taken innovative steps to use its status in the community to provide an impactful outreach program. The backbone of this outreach program is a focus on student engagement in the form of community service and service learning.

In embarking on service learning in engineering, faculty at Northeastern looked at other hallmark programs and research to prepare. Bringle and Harcher define service-learning as “a course-based, credit-bearing, educational experience in which students (a) participate in an organized service activity that meets identified community needs and (b) reflect on the service activity in such a way as to gain further understanding of course content, a broader appreciation of the discipline, and an enhanced sense of civic responsibility.”[2] There is a section in this work on first-year students, where there has been assessment showing significant learning gains in many areas such as in-depth understanding of course material, ability to relate knowledge with practice, and development of leadership skills. In engineering programs specifically, service-learning has been pursued in many different ways; many of these are described in a paper from Michigan Technological University [3]. This paper has looked closely at learning through service versus service learning, along with both courses and extracurricular programs such as Engineers without Borders. All the aforementioned programs provide students with learning and service experiences in different ways. Several leaders in engineering service learning have helped to guide the efforts at Northeastern University. EPICS, from Purdue University [4][5] has set the standard and has become a leader in engineering service learning. The positive outcomes for the students are clearly discussed, but the program is on a much larger and college-wide scale. Though many lessons can be learned and adopted from this existing program, the model is

out of reach for one faculty member working on their own. Another hallmark leader is University of Massachusetts in Lowell [6], where they have a variety of examples and possible approaches outlined, after chronicling the positive outcomes for students. Many other universities across the country are introducing service learning projects to better accommodate a sense of student engagement into their curriculums as well. Universities with such programs include Virginia Tech [7], Cal Poly Pomona [8], the University of Michigan [9], and the University of Colorado [10]. All these engineering programs have seen the shifts in student opinion and do not want to be left behind in the current trends. Much has been learned from these programs and previous Northeastern incidences and experiences in the development of the constantly evolving Northeastern engineering service learning program [11]. In the list of high impact practices in higher education from the Association of American Colleges and Universities[12], service-learning and community service are listed. At numerous keynote speeches and talks, these high impact practices are being discussed among faculty and leaders.

Northeastern University has grown to house over 70 service-learning courses across multiple disciplines including over 1,100 undergraduate students out of approximately 18,000 undergraduates campus wide. Northeastern has connections with over 80 community partners and has supported several service-learning and community service clubs. Two of the University's service-learning courses are highlighted in this paper. They have been selected because they are the first at the University meant solely for first-year engineering students.

Among the University entering class, there are approximately 750 first-year undergraduate engineering students on campus. Each engineering student is required to take a design course titled Cornerstone in Engineering. Each Cornerstone course has an overarching theme to connect work in design, AutoCAD®, C++, SolidWorks®, and MATLAB®. The sample groups for this research come from the four robotics themed sections of Cornerstone, each with approximately 32-36 students. Two sections are filled with students who have volunteered to be placed in a service learning curriculum. The other two sections are filled with a random distribution of the remaining entering engineering class.

The Cornerstone course was implemented in the fall of 2014 after an analysis of the entering class found that students were coming into the University with enough credits to skip some entry level courses but not enough credits to take technical courses [13]. Cornerstone was originally offered as a 14-week 400-hour course to allow students to get into their discipline-specific coursework in the spring semester of their first year. The tradeoff was found to be that students felt rushed. The following year, 28-week Cornerstone courses over 2 semesters were added to the slate. The Cornerstone courses in this study are from the 28-week setup.

The origins of the service learning Cornerstone began small. The Cornerstone curriculum is set up to climax with a group project at the end of each semester in which three to four students work together to demonstrate the skills they have learned in the course. Four years ago, a single group was offered to go to a local middle school every week over the course of the semester to teach the middle school students to build the same robot they were given in class. The students then gave a presentation on youth STEM education and their personal experiences at the middle school. Due to positive feedback, the program started its expansion from one group to several sections by 2016. They began working closely with a community partner who had 29 potential sites. Several sites are added each year. Currently, these sections have added more than 70 engineering students to the community outreach force each year, working with several

community partners. With success and continued support from both Northeastern and community partners the program hopes to be a fixture in the community as an avenue for STEM learning for middle school students.

An interesting side effect from this expansion was the desire of service learning section students to continue going to sites in a community service role after they were no longer in the service learning course, as upperclass mentors. With limited scaffolding in place to support the additional requests to serve, the need for a secondary path outside of the service learning course to volunteer was realized. In the fall of 2017, a student run service learning club was created to work in conjunction with the service learning sections to provide engineering service learning opportunities for those seeking them. The club provides a route for students to become mentors and leaders within the organization. In its first semester, the club worked with almost 100 students from the University, including approximately 70 from the Cornerstone sections, and approximately 150 children from the local community.

Service learning has many different avenues for implementation, ranging from grand one off constructions to continued mentorship programs. From the start, there has been a focused effort to make this service learning experience about creating a relationship between Northeastern University engineering students and local Roxbury middle school students. The program is structured to have engineering students visit sites once a week for ten weeks straight, working with the same two middle school students each week. This makes the engineering student not only a mentor but a teammate in the eyes of the middle school students. The result is more open communication between mentor and mentees about struggles, concerns, and triumphs. There are both engineering students and local Roxbury students who have been in the program for several years now because of the bonds they formed in their first semester.

There are twelve sites served by the two service learning sections. These sites can be split into two avenues. The first avenue for students is to go to one of two middle schools supported by the course. These sites are part of the Citizen Teaching [14] program in Boston Public Schools. Student visit the sites as an extended school day apprenticeship. The middle school students are required to join an apprenticeship each semester and attend it each week. The University students work with the middle school students to provide them with an introduction to robotics. The platform used at these sites is the same platform used in the Cornerstone course. This is an Arduino based platform consisting of a Sparkfun Red Board, two servo motors, two contrast sensors, an infrared distance sensor, and a metal chassis.

The second avenue is to go to one of the ten sites provide by the previously mentioned community partner. These sites are voluntary afternoon and evening programs throughout the community. Parents sign their children up for these evening programs and attendance is not mandatory for the children. At these sites, Lego EV3 Mindstorms kits are used as the platform to teach the children the engineering design process and introduce them to robotics. These kits consist of several types of servo motors, a distance sensor, a color sensor, a gyroscope, and several touch sensors. These components are put together using specialized Lego parts. This platform utilizes a drag and drop programming language created by Lego.

Both paths utilize the following structure and curriculum at their sites. The work at the sites parallels what the students are learning in the Cornerstone course, both focus on engineering design and using a robotic platform to accomplish a goal. The end goal for the sites is to build and code using their robotics platform to have a functioning sumo robot at the end of the ten

week program. Cornerstone students in the fall semester are also building and programming a sumo robot, albeit more complex in design and programming. A sumo robot is a robot capable of remaining within a circular boundary denoted with a color change. Advanced sumo robots are capable of scanning the mat for opposition sumo robots and seek them out in an attempt to remove them from the ring. The win condition is to be the only sumo robot remaining in the ring.

Each 1.5 to two hour session is structured as follows. University students spend approximately ten minutes catching up with the children and conversing about their week. A design challenge is then given to the children with the focus being placed on the design process, Ask-Imagine-Plan-Create-Improve [15]. This is a simple task meant to take between 15 and 45 minutes to complete. Design challenges in the past include the marshmallow challenge, bridge building, and creating detailed instruction sets or pseudo code. The remaining time is spent working on their sumo robots. The service learning students work alongside the middle school learners as they build and program the robots, it is a mix of teamwork and mentorship, both feel a sense of ownership and accomplishment at the end. All sites then meet at the University for a “Sumo Showdown” at the end of the semester to show off what they’ve learned.

## **Motivation**

This study comes at a transformation point in Northeastern University’s engineering service learning program. More and more students come into the University having done community outreach programs in high school. Many of these students found this rewarding for one reason or another and would like to continue serving the community in college. The University tries to keep a finger on the pulse of its entering classes. In addition, the University would like to connect students to their new community. As it recognizes the newest trends, it must adjust its structure and curricula to accommodate. This research aims to help with this continuous improvement.

The Cornerstone course has, since its origin, been trying to provide what the students are looking for in their first engineering course. A cornerstone course at McMaster University was developed with this quote in mind, “The objective of the Cornerstone is to instill in first-year engineers enjoyment from learning, motivation to continue learning, and genuine intellectual curiosity about the engineering in the world around them [16].” This quote also embodies the Cornerstone program at Northeastern University. The following motivation seeks to provide more information for the program to use to adapt and better serve its students.

The motivation of this study is threefold. First, it seeks to gauge the 2017 entering engineering class. It targets what differs between students who pursued the service learning Cornerstone course and students who chose a non-service learning section of the course. It attempts to set a baseline for the current expectations students have about their University, its engagement in the community, and their own commitment to the community surrounding the University.

The second motivation of this study is to learn how taking a service learning course affects the students’ desire to continue taking service learning courses. Is service learning a box to check off for students or is it a lasting commitment students are ready to make? Focus was paid to whether students wanted to take other service learning classes or wanted to continue volunteering with the club.

Finally, the study seeks to understand how taking a service learning course in the first semester of classes affects a first-year engineer. Focal points include grades in the Cornerstone course, their commitment to the community, and how they think service learning has affected their trajectory. This is to include open ended testimonial from students about their experience. One result of this study may be the expansion of the service learning course offerings. If this were to occur, there is interest in determining where resources are best invested and which of the previously mentioned avenues result in a more meaningful engagement experience. Similar research suggests that service learning does in fact impact a student's cognitive understanding in the classroom [17].

## **Procedure**

This study consists of two groups. The first group is considered the control group. It consists of students in the two non-service learning sections of Cornerstone focused on the topic of robotics. The second group consists of students in the two service learning sections of Cornerstone focused on the topic of robotics. The two differ in only two major facets. The first is that different professors teach the control group and the test group. The second is the added requirements for the students in the service learning sections to attend their community service site each week. Great care has been taken to otherwise maintain similarity between the Cornerstone curriculum in the service learning sections and the curriculum in the non-service learning sections. Both professors meet regularly to discuss their progression to date and co-write curriculum for future classes. This results in the non-service learning section having a uniquely strong validation as a control group for this study.

Approximately one month into the fall semester, students in all four sections were emailed by the service learning sections teaching assistant requesting them to take part in the voluntary entry survey. This survey was given in the form of a Google Survey. It was relayed to the students that the survey was completely anonymous and their answers could in no way be connected to them. Sixty-one students from the service learning sections completed the survey and 29 students from the control sections completed the entry survey.

The entry survey aimed to gauge the students' high school performances, including overall grades, enthusiasm per subject, and engineering exposure. Students were then asked their intended discipline, how prepared they felt for the Cornerstone course, and several questions about their future experiences with the community surrounding the University. These community questions included how much the students felt they know the community, whether they have an inclination and desire to interact with the community, whether they have an inclination and desire to add to the community, whether working in the community would enhance their experience at the University, whether working within the community would enhance their academics at the University, and whether they had plans to do community service outside of any service learning coursework while at the University. The goal of these questions was to pin point whether there is a profile for the typical first-year engineering student that is interested in service learning that differs from the profile of a generic first-year engineering student.

In addition to these questions, the service learning sections were given service learning specific questions. They were asked an open ended question about what they hoped to get out of taking a service learning course. They were asked whether they did service learning, community service, or worked with middle school students while they were in high school. Students were asked

whether they would make an impact on the community because of their service learning experience. The last set of questions asked how much they agreed or disagreed about how service learning would impact them. Impacts asked about include making them more aware of the community, making them more connected with the community, making them do more community outreach after their first year, making them understand concepts being taught in class more, making their college experience different, making them rethink their discipline choice, and making them a well-rounded student.

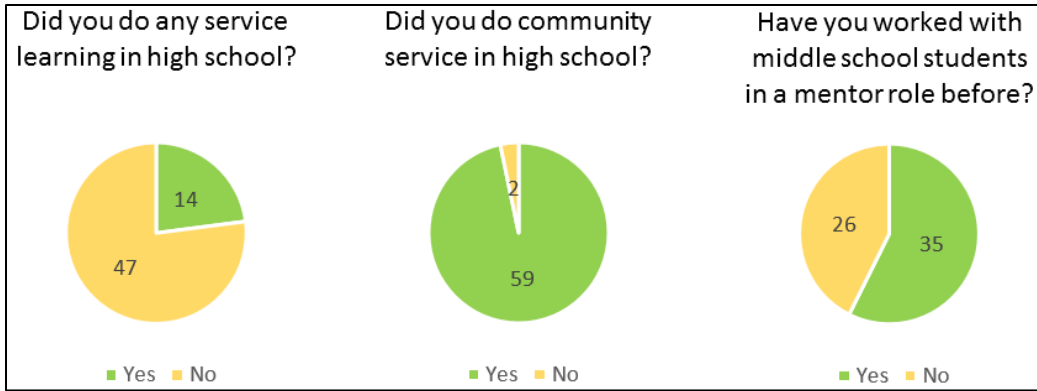
At the start of the spring semester, students were once again given an anonymous survey to complete. Students were emailed the exit survey, another Google Survey, by their Cornerstone professors. It was once again relayed that the survey was anonymous and their answers in no way would be connected back to them. 59 students from the service learning sections responded to the survey while 41 students from the non-service learning section responded.

This survey was very similar to the entry survey. The few differences for the non-service learning section include adding the original questions given to the service learning students and whether they plan on taking a service learning course in the future. These questions were added to get a better profile for the typical first-year engineering student. The few differences for service learning students include questions asking what they got out of service learning, if they had any stories to share, whether they plan to continue working in the club and whether they plan on taking another service learning course. Some of the largest impacts service learning can have on students are the stories and memories they gain from it. These added questions gave students the chance to relay the stories they found most telling.

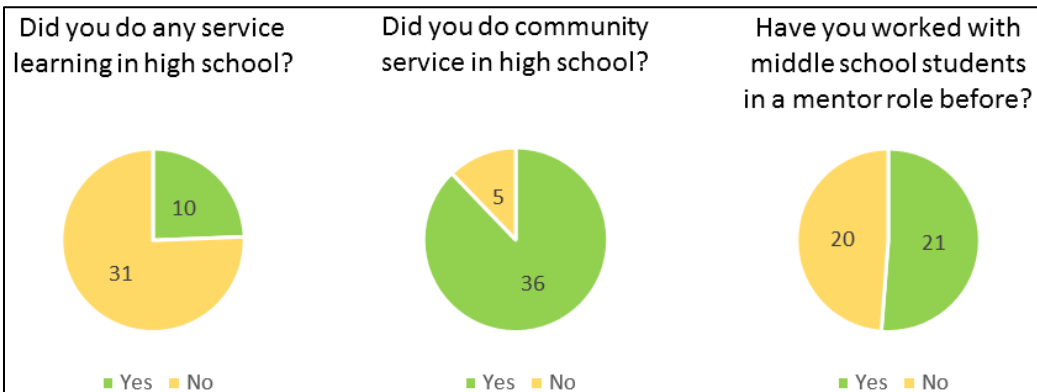
## **Results**

The first motive outlined in this study was to get a better understanding of the 2017 entering engineering class, what it stands for, and what expectations they have of the University. The entry survey provided a good picture of what an engineering student entering the university looks like. Students reported similar enthusiasm and grades in high school core subjects. Overall, students received grades in the A to B range. Most engineering students were found to be enthusiastic about math and science while being unenthusiastic about history and art. Both groups had between 30 and 35 percent of participants polled say they took engineering specific courses while in high school. The general trend was that most students feel prepared for college and engineering coursework. Overall, on a scale from one to ten with ten being the most prepared, students ranked their preparedness for their Cornerstone class at a six and a half.

Figure 1A shows the results in the entry survey of questions given to service learning students about what they did as high school students. Figure 1B shows the results in the survey of the same questions given to non-service learning students. It can be seen from the figures and statistics that both groups entered college with comparable experiences and qualifications.



**Figure 1A**

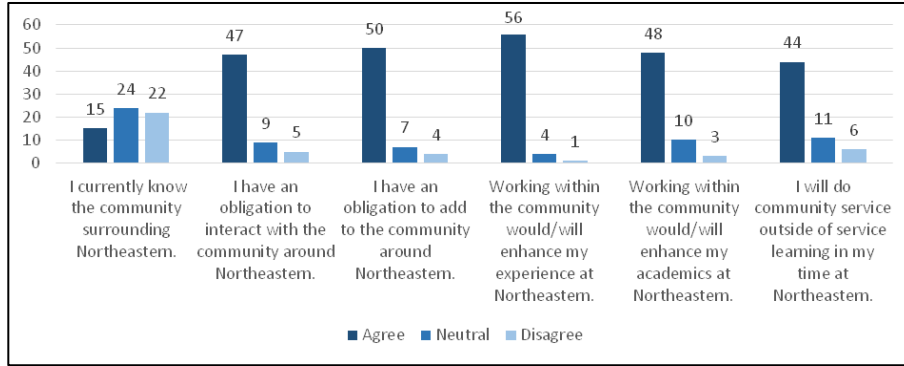


**Figure 1B**

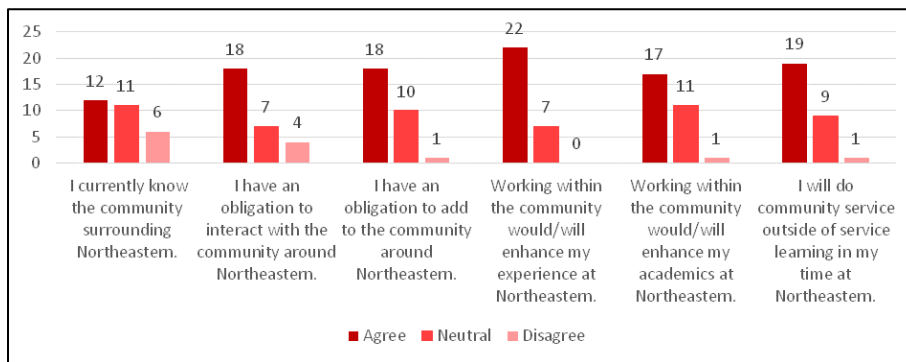
*Figure A shows the responses to three questions by students in the service learning section of the course while taking the entry survey. Figure B shows the responses to the same three questions by students in the control section of the course while taking the exit survey.*

With comparable entering characteristics, next, opinions on the university, community, and service learning were discussed. Figure 2A shows the opinion of the service learning sections as they entered the course. Figure 2B shows the opinion of the control sections as they entered the course. There is a statistically significant difference between the two groups, confirmed using a t-test,  $p < .05$ . Students who volunteered to be in the service learning section of the course believe that as they enter college, they do not know the community surrounding the University while student who did not volunteer to be in the service learning section believed that they did know the community around the University. Service learning students were also more likely to feel they are obligated to add to the community and feel that working in the community would enhance their experience and academics at the University.





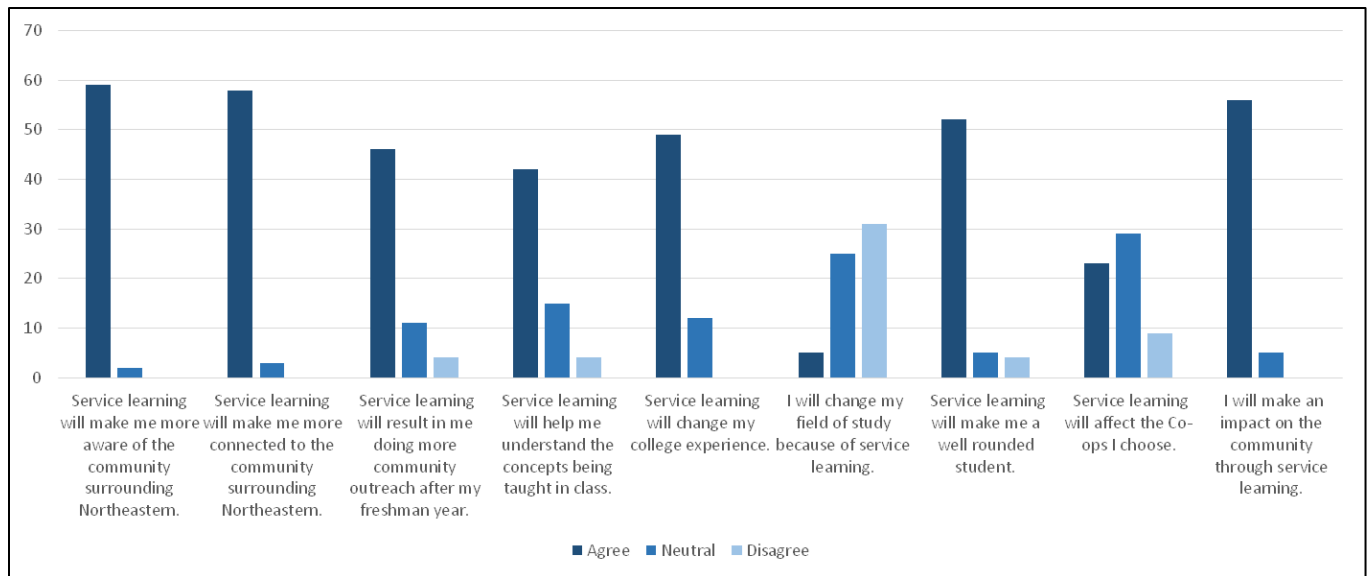
**Figure 2A**



**Figure 2B**

*Figure A shows the responses to community related questions by students in the service learning section of the course while taking the entry survey. Figure B shows the responses to the same questions by students in the control section of the course while taking the entry survey.*

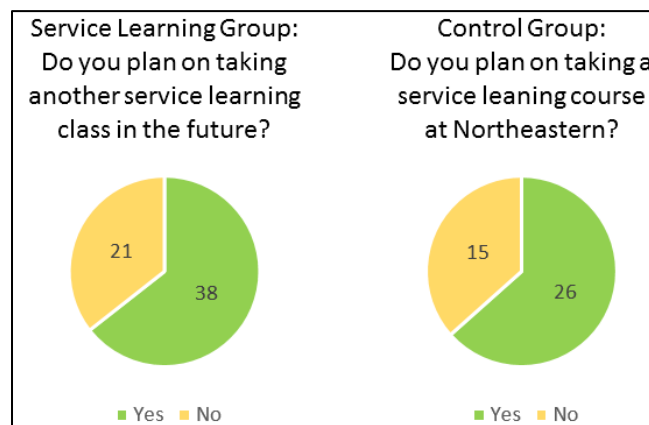
The final portion of this “service learning profile” was to see what these students felt was the benefit to taking a service learning course. Figure 3 shows the responses students had to questions centered around the impact they expected service learning to have on them and the impact they expect to have on the community around the University. It can be seen that they have an expectation that service learning will not only help them connect to the community around the university, a concept they pointed out as important to them in figure 2A, but also help them become a better academically prepared and well-rounded student. It can be seen that not a single student in the service learning program felt that they would not make a difference in the community.



**Figure 3**

*This figure shows responses in the entry survey to questions focused on the impact service learning would have on students in the service learning section.*

The second motive of this study was to find out if taking a service learning courses satisfies a student’s appetite for community service or if getting a taste of community service makes them seek out more service learning opportunities. Figure 4 shows that both students who have taken a service learning course and students who have not taken a service learning course are equally likely to want to take a service learning course in the future.



**Figure 4**

*This figure shows responses by service learning and non-services learning students in the exit survey to a question about whether they wanted to do a service learning course in the future.*

The more telling information however comes from the students short answer responses to why they did or why they did not want to do service learning in the future. There are some commonalities between students’ responses that is telling and may prove insightful for a University attempting to grow its community service roots.

Of students in the service learning section that said they do not plan on continuing to go to sites, there were three main points. The first point is that students do not have time to go to site. This is perfectly summed up by the following response given in the survey. "It was already a struggle trying to fit service learning in with my schedule and I believe my schedule is only going to get busier from here on out." To this point, many engineering students may only have a relaxed enough schedule to do service learning in their first year. A slightly different response were those similar to, "It's not part of my study plan. I plan to volunteer for [x club/group] instead." This is the student who feels that they can get more out of joining an outreach club than taking a service learning course. These students were less likely to think service learning helped to understand concepts taught in class. The final grouping of students were those who said something like the following quote. "They are not offered for the major, but if they were then I definitely would." This is an important point. Again and again students responded saying they did not know of any service learning courses available to them.

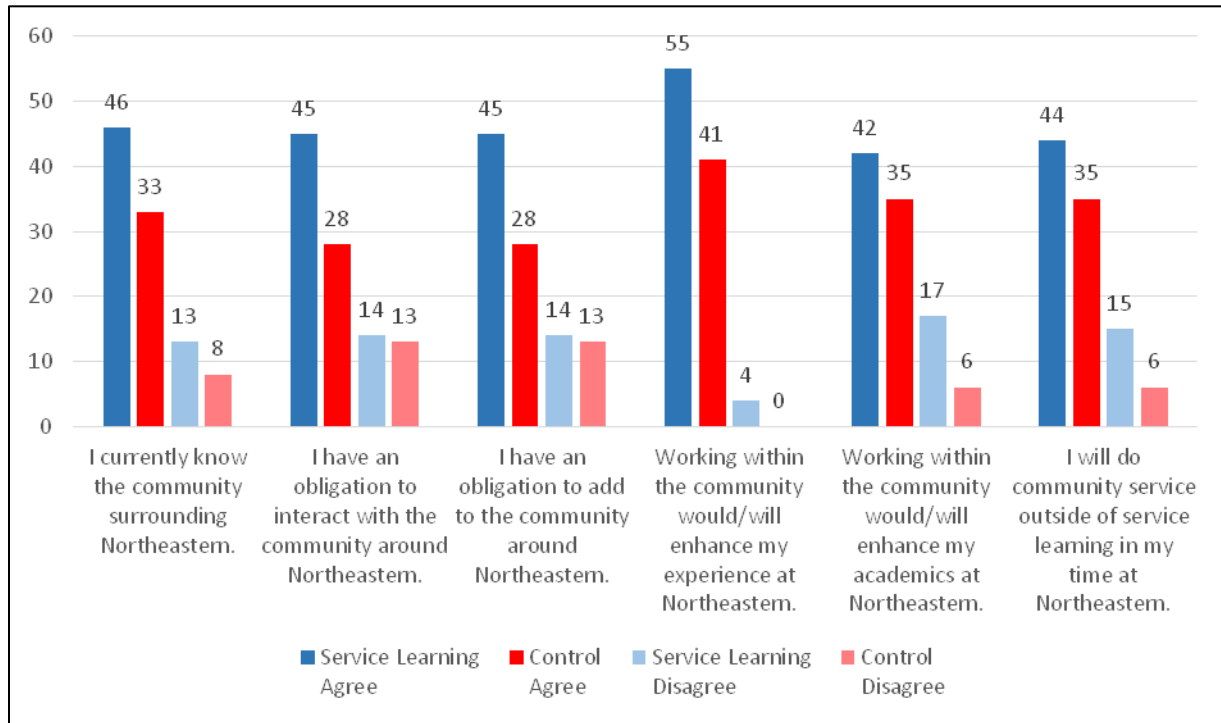
Students in the control group had two major reasons for not wanting to take a service learning course. The first, like the service learning group, was the time commitment required for a service learning class. The second depicted in the following quote was that they were not interested in the concept of taking a service learning course. "It's something I'm personally not that interested in."

For students in the service learning courses that want to take service learning courses in the future there were three main points given. The following quotes summarize the first point. "I am incredibly passionate about community service. Connecting it to another class would only enhance the class's academics as it did in Cornerstone." This is the kind of student who felt strongly that service learning was well connected to their Cornerstone course. They are the students who were more likely to agree that service learning has helped them understand the concepts being taught. The second grouping gave responses similar to the following quote. "Service learning is so important ... for making yourself more aware of the surrounding communities. It is so important to recognize that [Northeastern University] is in a sort of bubble and the only way to understand what's outside of that is through teaching and interacting with young students." The main concept is that these students feel that they made an impact on the community and they want to continue making an impact on the community. The third group gave responses such as "It's just straight up fun." These are students who enjoyed themselves. Many students wrote that this was a break from the book work that they looked forward to each week.

For students in the control group that want to take service learning courses there was a single concept in almost all responses. They are well summarized by this quote. "It is important to give back to the community that you are a part of. If we are capable of helping out then I think we have an obligation to and not just ignore the privilege that we have." These students either want to engage in service learning to get to know the community around them better or to help improve the community in any way they can.

The last thing the service learning students were asked about for their future ambitions was whether or not they planned to continue being a member in the community service club after they finish the Cornerstone course. More than 50 percent of student said that they do plan to continue working with the club and going to sites in the future. This suggests the potential for community service growth even if there is not growth in service learning opportunities. A club is often a more flexible option for students than a course.

The final motive of this study was to determine how taking a service learning course affects a student, their opinions, and their trajectory. All students were asked what grades they received in Cornerstone. Almost all students received A's with no significant difference between the two groups. Figure 5 shows the same questions asked in figure 2 with responses from the exit survey. Note that a neutral response option was removed when the exit survey was created.

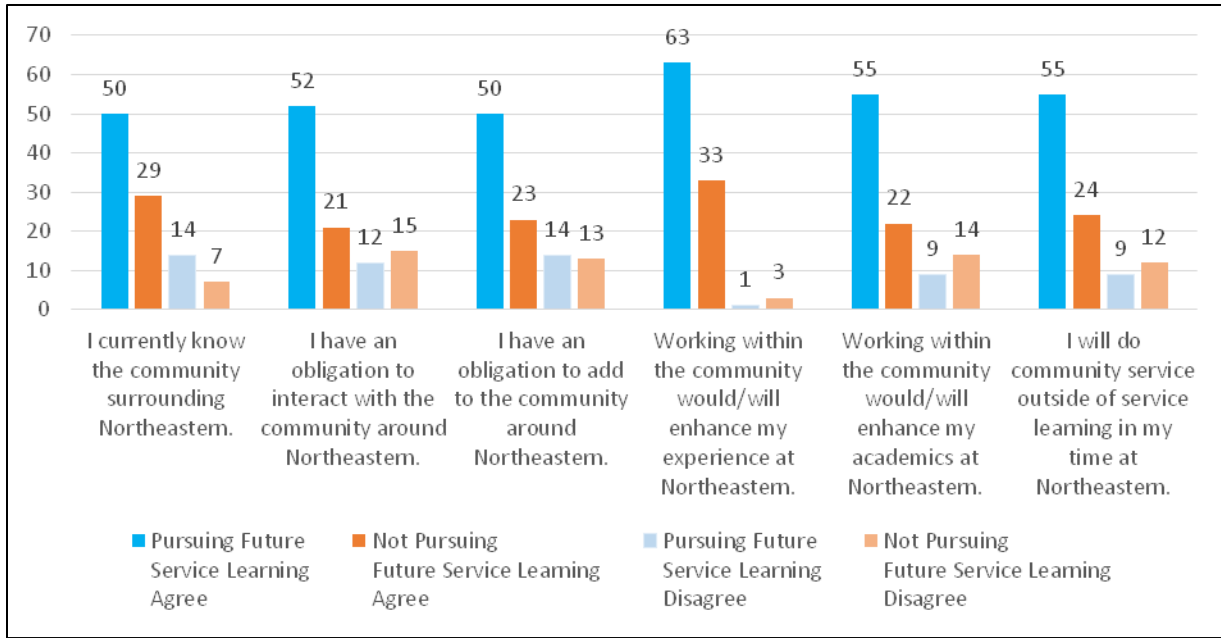


**Figure 5**

*This figure shows responses from the exit survey to questions about the students' obligations to the community asked in both surveys.*

When comparing responses in figure 5 to responses in figure 2, there are several observations to be made. The first involves their understanding of the community around the University. Though both groups had an increase in the percent of students who thought they understood the community, the service learning group went from 40% agreement to 78% agreement. On the flip side, students who took service learning sections were less likely to say they would do community service in the future or that working in the community would enhance their academics.

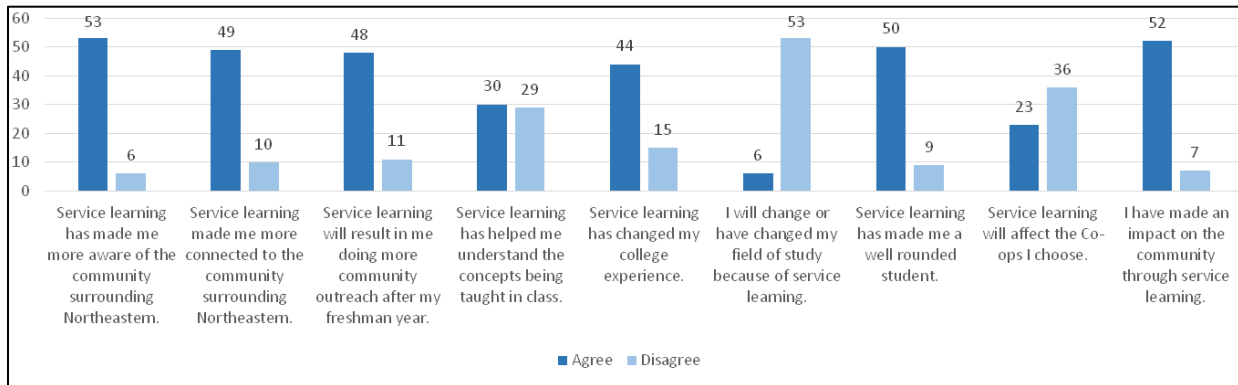
Regrouping this data based on whether the student plans on pursuing future service learning experiences paints a slightly different picture. Figure 6 shows that students who plan on doing service learning still believe that community service would enhance their experience and academics at the University. These students are also far more likely to feel like they have an obligation to interact with the community as well as plan on doing community service in the future.



**Figure 6**

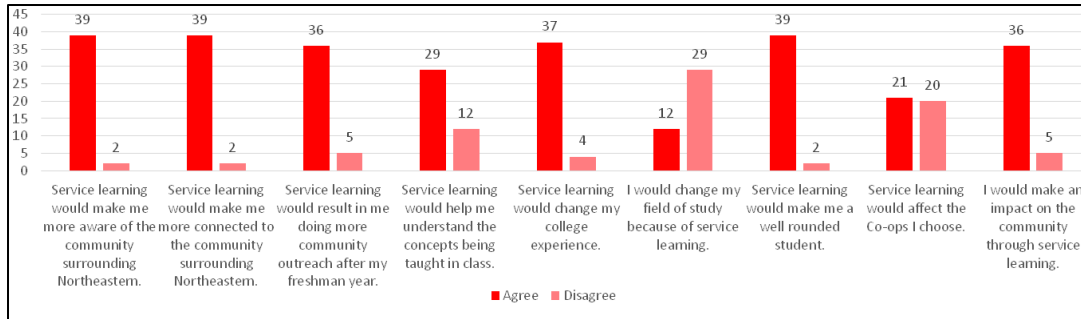
*This figure regroups the responses mentioned in figure 5. This regrouping is to show that a large percentage of individuals who disagree with the statements also do not plan on pursuing any more service learning courses.*

In the next section, both groups of students were asked the same service learning specific questions asked in the entry survey. Figure 7A can be compared directly to figure 3 to show a before and after representation of the students feelings about service learning. It can be seen that having taken the service learning course, students are less likely to believe that service learning has changed their college experience than they believed it would when they were entering the program. Students were also far less likely to believe service learning helped them understand the concepts being taught in the curriculum for the course.



**Figure 7A**

*This figure compares feelings about service learning before and after participating, similar questions to figure 3*



**Figure 7B**

Figure A shows responses from the exit survey to questions about how students in the service learning sections feel service learning have affected them. Figure B shows responses by students in the control group on how service learning would affect them.

Students in the service learning section of the course were also asked to share any stories that they had from their sites. Many students provided stories and there is one major thread between them. The students repeatedly discuss resilience. The students' most memorable events from their sites were not winning the showcase or completing some complicated code. They were the light bulb moments when their middle school students finally realized how everything works or the moment the student who had been resisting the learning experience the entire time finally became a contributor to the project. Some of the more detailed responses are listed below.

"I didn't think that the kids who were doing our service learning project were particularly invested in their robots. A lot of them seemed to view it as a bit of a waste of time. Once we had the sumo competition, however, I saw how excited and passionate they were and this made me feel much better about myself."

Although this is a typical outcome for an engineering student with success on a project, the goal of the program is to provide this experience to a middle school student who might not otherwise get this taste of engineering success.

"I realized I needed to explain things with a more hands on approach when I was explaining how robots understood when to turn and when to go forward. [The student] stood up and started walking through all of the pseudocode we had written, and I realized that creating a physical representation of what the code meant would be more beneficial."

"I realized that, like in most situations in life, you shouldn't be too worried about following the rules, or wondering what everyone else was doing. The first few times at the learning site I kept asking myself 'how is everyone else teaching these kids, am I doing this the right way'. After a few visits, I figured out that I could pretty much just do my own thing, however I wanted and as long as that was successful it was fine. There isn't often a set 'correct' way to do things."

These quotes really summarize the true value in this service learning course for the students. Successfully teaching the middle school students has instilled confidence in the University students.

## Conclusion

This study set out in search of three findings. The first was a better picture of what the entering engineering class encompasses in its high school experiences and its expectations for their

college experience and expectations of their University's behavior and offerings. Within this was the search for any distinction between students who volunteered for a service learning course and those who did not. The second was to determine if there is a desire by students to take service learning courses after their first year at the University and whether taking a service learning course enhances or suppresses students desire to take more service learning courses. The last was to determine how taking a service learning course affects a student's perspective of service learning, the University, and their own trajectory.

The typical first-year engineer comes into the University with A's and B's, show enthusiasm for math and science, and feels prepared for their engineering course load. The typical first-year student has not had any service learning or engineering courses in high school however they have both done community service and worked with middle school students. First-year students who have volunteered for a service learning section of Cornerstone are far more likely to feel they do not know the community surrounding the University than a student who has not. They are also more likely to believe service learning will bring added value to their academics and overall experience at the University.

Two thirds of students plan to take a service learning course after their first year at the University. This was independent of whether they took a service learning course their first year. Among the most prevalent reasons a student who had taken a service learning course was not planning on taking another service learning course was due to how time intensive they are, how scarce they are in the engineering course offerings, and how many other opportunities there are to volunteer and make a difference in the community. Among the control group reason ranged from not being interested to not having enough time. For students who wanted to take another service learning course, they noted how fun their first experience was, the impact they made on the community, and the connections it made in the classroom as reasons for wanting to. It was also found that more than 50 percent of students wanted to continue going to the sites they went to in future years. This robust desire to serve the community shows an opportunity for the University to better meet student expectation.

The survey found that after taking a service learning course, students are more likely to feel they know the community surrounding the University. It is also worth noting that, for some students, service learning left them feeling the added work did not lead to a better understanding in the classroom as they expected. Students who felt this way were less likely to pursue service learning courses in the future and gave the reasoning that it takes too much time from their schedule.

Overall, this study provides a compelling case to expand the service learning selection at the University. It shows that students want to be a part of the broader community rather than just the University community, as has been found across the nation. They want this premise to be integrated into the courses they take and they want the opportunity to do work in the community in their upper classman years while at the University. It shows that students who have taken a service learning course still want to take other service learning courses and that many students do not plan on taking service learning courses because they do not think the University will offer them service learning courses within the engineering curriculum.

Reflections written by the first year students have allowed them to go deeper and really analyze and assess how service-learning has impacted them and what they have learned. These have also helped guide the program, and are an integral part of the course and learning outcomes.

## Future Studies

The concluding question in the exit survey for students who were in the service learning section of the course was whether they would like to participate in a case study over several years while they are at the University. 15 student responded with interest in the case study. We plan to check in with these students periodically to see how taking a service learning course actually changes the trajectory of their studies.

Over the last 4 years there have been many students who started in the service learning groups of this course. Some have gone on to help found the service learning club, lead sites, and become teaching assistants for the Cornerstone course. We hope some of these 15 students pursue one of these paths so that we can document it every step of the way. This can provide valuable insight on how, for a few students, a service learning course can completely change their life and how a service learning course can be adjusted to impact a larger percentage of students in this way. We hope to see why for some students the service portion of the course added so much to their academic experience and for others it added much less. If we can figure this out, we can make the added course load worth it for every student and the University.

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