Student Perceptions and Attitudes Towards a Required vs. an Optional Course in Leadership

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Abstract

For almost ten years, the majority of students in the College of Engineering and Technology at Brigham Young University have been required to take a sophomore level leadership foundations course focused on leadership principles, ethics, and global issues. The course is part of an overall leadership framework whereby students are introduced to the importance of leadership as freshmen, learn foundational leadership principles as sophomores, and practice these principles as juniors and seniors.

The leadership foundations course is required for graduation by 7 of 10 programs within the College of Engineering and Technology. Students external to the college also participate in the course as it fulfills two general education requirements for graduation. As a result, the college teaches approximately 12 sections each academic year averaging 60-80 students per section. Approximately 10-15% of student course participants are external to the college.

In this paper a survey is presented of 163 students initially enrolled in the leadership foundations course regarding their perceptions and attitudes towards leadership. Results include a comparison of students who are required to take the course and those for whom it is optional. No statistically significant difference was observed between the two groups of students except for their expectation regarding workload. The engineering and technology students expected the leadership foundations course to be easier, relative to their other classes, than the non-engineering and technology group. In general, both sets of students had high expectations for the course and expressed positive attitudes towards learning about leadership. For example, students in both groups indicated they felt learning about leadership was somewhat more important than learning the skills of their discipline.

Introduction

A majority of students in the college of Engineering and Technology at Brigham Young University have been required to take a foundational leadership course for almost ten years. In this paper the authors examine some of the attitudes and assumptions of students towards studying leadership and also compare the attitudes of students who are required to take the course to those for whom it is optional.

The paper begins with the background of the institution which provides some context for the BYU leadership program. The rationale is then given for making a leadership foundations course required, and the pros and cons are discussed of required vs. elective courses in general. Data are presented from 163 students on their attitudes towards leadership and the two groups (required vs. optional) in the study are compared.

Background

Brigham Young University

Brigham Young University is one of the largest private universities in the United States, with more than 33,000 students. Admissions are selective. It is a national university with students from all 50 states and 100 countries. It is a religious institution, sponsored by The Church of Jesus Christ of Latter-day Saints.

BYU College of Engineering and Technology

The College of Engineering and Technology currently has an enrollment of 4,200 students in five engineering and five technology programs. The college awards approximately 650 B.S., 100 M.S. and 20 Ph.D. degrees annually. These degree totals reflect the direction of the Board of Trustees that BYU remain predominantly an undergraduate institution. About half of the B.S. graduates go on to graduate school at BYU or other schools around the country.

Profile of 2015 Freshman Class

In order to understand why the college elected to require leadership training for all students, it is helpful to go into some detail regarding the profile of the freshman class. The average ACT score for incoming freshmen in Fall 2015 was 29.0 This represents approximately the 92nd percentile for the exam. Thus, in terms of this criterion at least, the students have good academic preparation. But perhaps just as significant, relative to leadership, are some of the other student body characteristics. For example, 40% of the freshman class earned the Eagle Scout or Girl Scout award; 27% served as the captain of a varsity athletic team, and 13% were a student body officer in high school.[1] A majority of the students serve as missionaries between the ages of 18 and 19 for 18 months to two years. This voluntary service often involves living abroad or learning a second language—about 70% of the students speak a second language as a result. As they become seasoned missionaries they also receive leadership experience in directing the efforts of younger missionaries.

Establishing Leadership as a College Direction

A new college administration, which included the first author of this paper as dean, began in 2005. It was natural that the new administration took some time to identify strategic directions it felt would help prepare students for success in the 21st century and increase the visibility of the college.

Concurrent with these deliberations, a report was released from the National Academy of Engineering entitled, "The Engineer of 2020," which discussed the forces acting on engineering in the United States and what preparation engineers needed to be competitive in the global economy.[2] This report was accompanied by a number of credible voices and other studies which supported its conclusions.[3,4,5] The report indicated that the skill set for engineers needed to expand beyond analysis and technical skills to include leadership skills, creativity, ethical responsibility, global competence, and a commitment to lifelong learning.

In response to these reports, the college strategic directions gradually coalesced into initiatives referred to by the acronym "LIGHT," as given in Figure 1. As shown in the figure, the letters stand for Leadership, Innovation, Global agility, High character, and Technical excellence. Thus developing leadership skills among students became one of the priorities of the college.

Figure 1: The college strategic initiatives, 2005-2016.

To develop leadership, the college proposed a framework for students in the entire college. This framework is shown in Figure 2. In the freshman year, students would be taught why leadership is important and encouraged to develop a pathway for their own leadership development. In the sophomore year, they would take a course, EngT 231 - Foundations of Global Leadership, in which students would learn leadership principles, ethics, and global issues. They would then apply the concepts of this class to projects or other course-based experiences in their junior and senior years, as well as in extra-curricular activities such as clubs, service projects, or study abroad programs.

College leaders admit to some naiveté and perhaps even hubris today in trying to involve all students in the college. The rationale for doing so relates back to the profile of the entering students given previously. It was felt that BYU students had high leadership potential and could benefit from some instruction and emphasis on this topic. Indeed, given the investment being made by others in their education (tuition at BYU is heavily subsidized), they were *expected* to be leaders. Thus it was decided that all students should have some leadership training.

Taking the class does not delay their graduation, as it counts for two general education (GE) requirements. However, it does preclude taking another GE course.

The logistics, however, were daunting. Teaching this course to all students in the college meant providing about 12 sections per year with 60-80 students in each section. The college started slowly in 2006 with two sections per year and gradually ramped up until all students in the sophomore class could be accommodated.

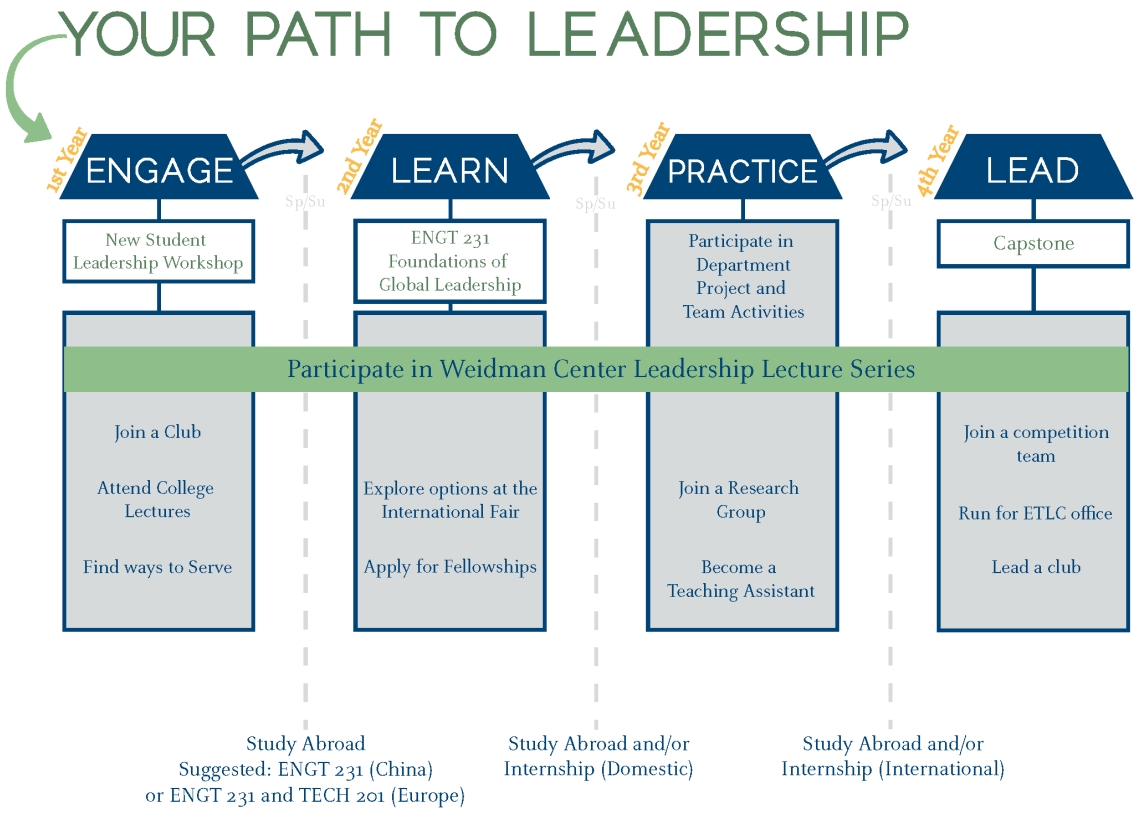

Figure 2. Leadership Framework at BYU. The class EngT 231 is taken during the sophomore year.

Leadership Programs Nationally

The development of a leadership emphasis at BYU seems to have coincided with an emerging national interest in engineering leadership development. One indicator of this is the formation in 2014 of a new division within ASEE focused on leadership—the Engineering Leadership Development Division, or LEAD. Having started from the efforts of a few people, it now has more than 860 members.[6]

Given the relative novelty of these programs, it is not surprising that a number of papers have recently reviewed prominent engineering leadership programs. One of the first was a review in 2009 of eight international engineering leadership programs done by Graham, Crawley and Mendelsohn.[7] Palmer et al. summarized data for 30 programs.[8] Klassen et al. initially identified 35 engineering leadership programs and then focused on 14 key schools for an in-depth survey.[9] Paul and Gradon developed a summary of best practices based on a review of 11 programs.[10]

Based on these reviews, in one area, at least, BYU is different. It is one of a few universities conducting engineering leadership training on large scale. In the Klassen et al. paper for example, programs were categorized based on both "Inclusiveness" and "Compulsoriness." Full inclusiveness is described as "leadership is for all engineering students, regardless of their

interest in the topic or their natural aptitude for it." Southern Methodist University is cited as having a strategic goal of "leadership is for everyone." At BYU we also felt "leadership is for everyone," and based on the entering freshman profile, concluded that most had an aptitude for it. Compulsoriness refers to whether the program is mandatory. (It would seem Inclusiveness and Compulsoriness would be highly correlated.) Quoting from the paper, "An example of this is Brigham Young University's engineering leadership course, which is mandatory for all second year students, with the recent exception of chemical, electrical and computer engineering students, for whom it is optional." Most of the other programs studied are at the other end of the spectrum for this measure, meaning leadership instruction is optional and involves a small number (e.g. <50) of students.

Required Vs. Optional: The Tradeoffs

There are some trade-offs in making the course mandatory. Students are not in the class by choice, and several instructors feel this affects their attitude. There is a long tradition in engineering of required classes, but a required class in leadership seems somewhat different than, say, a required course in statics or heat transfer.

Relative to teaching evaluations, it is known that elective courses generally receive higher evaluations for both the class and instructor than required courses. In an oft-cited paper on teaching evaluations, Feldman reports, "teachers of non-required or elective courses as well as the courses themselves receive somewhat higher ratings than do their counterparts." He also reports a small positive relationship between elective class ratings and students' intrinsic interest.[11] Brandenburg et al. found a strong correlation between student ratings of instructors and elective or required status.[12] These findings were also supported by Scherr and Scheer in an analysis of student evaluations of business courses.[13]

It is not surprising that students' evaluations would be higher for a course they have chosen to take than for one they were required to take. Indeed, after some discussion, several years ago the college leadership invited departments to make the class optional if they so desired. This would not only result in students choosing the class but it would mean fewer sections would need to be taught.

An advantage to having the course be required is universal coverage, particularly as regards to ABET accreditation. A number of programs rely on the class to provide instruction about teams and ethics, and for accreditation purposes they must be able to demonstrate that all students receive this instruction.

Student Attitudes and Perceptions

Within this context, the current study sought to assess student attitudes and perceptions about EngT 231, Foundations of Global Leadership, for both students who are required to take the course and those for whom it is optional. Because the class fulfills general education requirements, 10-15% of the students taking the class are from outside the college and are taking it as an elective.

As has been mentioned, multiple sections of the course are taught each semester. Each instructor is given some latitude in how the course is taught as long as the outcomes are achieved. The current outcomes are given in Table 1 below.

Table 1: Outcomes, EngT 231 - Foundations of Global Leadership

1. Understand and describe what it means to be a leader. Cultivate your desire to become an effective leader by developing one or more leadership qualities.
2. Understand ethics and integrity, and practice both in your personal and professional life. Describe and apply a procedure for effectively implementing ethical decisions to solve ethical problems of practical interest.
3. Understand and be able to describe the importance of self-awareness to effective leadership. Increase your level of self-awareness.
4. Understand and be able to use a model (e.g., MBTI) to describe personality type and/or preferences. Use this model to increase your effectiveness as a leader.
5. Define and effectively practice key interpersonal skills (e.g., effective communication, influencing others and managing conflict). Develop or refine at least one interpersonal skill.
6. Understand and describe the principles and processes that lead to effective teams. Evaluate and improve your effectiveness as a member of a team on assignments, activities, and/or a class project.
7. Value diversity and the different perspectives, experience, skills that individuals bring to a team. Be able to effectively utilize those differences to enhance team performance.
8. Develop skills needed to understand and establish a vision, establish goals, formulate a strategy and develop a plan consistent with a vision. Develop an ability to manage and prioritize your time effectively.
9. Understand and be able to describe globalization including its historical context, driving forces and influences. Compare and contrast the positive and negative impacts of globalization. Demonstrate an understanding of a few global issues.
10. Appreciate, understand and demonstrate how cultural factors influence communication, teamwork and the practice of technical disciplines within a global context. Improve your multicultural skills through practice.
11. Understand and develop experience with research methods used in an area of social science at an introductory level, including the collection, use, and evaluation of data, and the generalization of results as theories or models.

At the beginning of the Fall 2016 semester, the following statements were scored by students in three sections of the course using a Likert scale.

1. I feel I already know a lot about leadership.

Strongly Disagree			Neither disagree or agree			Strongly agree
(1)	(2)	(3)	(4)	(5)	(6)	(7)
□	□	□	□	□	□	□

2. Leaders are born not made, i.e. you can't really learn leadership skills.

Strongly disagree			Neither disagree or agree			Strongly agree
(1)	(2)	(3)	(4)	(5)	(6)	(7)
□	□	□	□	□	□	□

3. Compared to the skills learned in my major, leadership is,

Much less important			The same in importance			Much more important
(1)	(2)	(3)	(4)	(5)	(6)	(7)
□	□	□	□	□	□	□

4. I expect to learn a lot in this class about leadership.

Strongly disagree			Neither disagree or agree			Strongly agree
(1)	(2)	(3)	(4)	(5)	(6)	(7)
□	□	□	□	□	□	□

5. Compared to classes in my major, I expect EngT 231 to be,

Much less difficult			The same in difficulty			Much more difficult
(1)	(2)	(3)	(4)	(5)	(6)	(7)
□	□	□	□	□	□	□

A summary of the data is given in Table 2 below. The number of respondents for the required group was 145; the number in the optional group was 18. The comparison of results was done utilizing a standard t-test. The analysis was also completed using a non-parametric statistical analysis (chi-squared test) to test whether the assumption of interval level data held. The results were similar to that of the t-test analysis.

Table 2: Summary of Responses (Mean Values)

Question	**EngT 231 Required (n = 145)**	**EngT 231 Optional (n = 18)**	**Difference Significant (at 0.05 level)?**
1. Already know about leadership	4.5	4.8	No
2. Leaders are born (reverse scored)	2.5	2.2	No
3. Compared to skills in major	4.7	5.2	No ($p = 0.081$)
4. Expect to learn a lot about leadership	6.0	6.2	No

5. Course Difficulty	3.0	3.6	Yes ($p = 0.022$)

The data show that the only significant difference between the two groups occurs for the evaluation of course difficulty. The engineering and technology students (required) group expected the course to be less difficult than their other courses as compared to the non-engineering (optional) group. It is possible that differences in means for other questions would be more significant if there were a larger optional group.

Although not much difference in groups was noted, the overall attitude of students as given by the questions was quite positive. Even though both groups felt they already had some knowledge about leadership (4.5 mean for both groups taken together), both felt leadership can be taught (2.4, reverse scored), that leadership is somewhat more important than the skills of their major (4.7), and that they expected to learn a lot in the course (6.0). These results were encouraging, particularly the response that students consider leadership to be somewhat more important than the skills of their major.

These general questions were augmented to some extent by student journals. In one of the sections surveyed, the students were required to keep a weekly journal where they reflected on what they learned about leadership. Students could write anything they wanted, but they knew the journals would be read by the instructor. Several students commented that they came into the class with low expectations but had since experienced a change in attitude, as given below. These entries are used by permission.

> "I was honestly not very excited to take this class and was ready to just go through the motions to get an A for my transcript, however after the first week of class and doing the homework I have realized how vital this class will be to my future. I can see that this class will help me in every aspect of my life, whether that be in my career, as a father, or as a member of the community/church."
>
> "When I signed up for this class I assumed that it would be an easy class that I wouldn't really learn much from, in all honesty how can a class teach someone to become a better leader? Nevertheless, I can now see that just from the last two weeks of class I am already learning to be a better leader, not by giving presentations or taking charge of major groups and projects but instead by understanding myself better. Self-mastery is an essential step in developing leadership skills."
>
> "To be honest I wasn't very excited about taking this class. I saw it as more of a requirement than anything else. But now I am actually looking forward to what I can learn in this class. The pre-assessment was very eye-opening for me. I realized that there is a lot more for me to learn. I got back from my mission less than 6 months ago, and I think that returned missionaries often have the "I have everything figured out attitude." I have had that I think. It is good to know that there is still a lot more for me to do."

In counterpoint to these comments is the following statement:

> "I kind of view this class as just a lot of busy work. I like the stuff we are learning, but I feel like the homework and readings are a little excessive and they don't actually make any contributions to my leadership abilities. The material can help me be a better leader, but I don't learn by reading from a textbook, and then writing a half page summary about what I learned. I also don't learn leadership by looking at boxes…I learn leadership by studying leaders. By seeing their example. Aside from the personal assessments I have done, the best thing that taught me about leadership this semester was watching Gandhi. So you can probably tell my attitude about this class hasn't been very good."

If the course can exceed expectations, then for some students at least, having it be mandatory is a blessing in disguise, inasmuch as they would not have taken it otherwise and now find it to be valuable.

As another data point, in one of the sections students were asked at the end of the course to comment on 1) how they felt about the class being required at the beginning of the semester, and 2) how they felt about the class being required now, at the end of the semester. That is, students were given a choice of three responses for both the beginning and end of the semester:

1. I wish the course were optional so I could have taken something else.
2. I wish the course were optional for other reasons (please explain).
3. I am fine with the course being required.

Since they could pick from one of three choices at the beginning and end of the semester, there were nine possibilities. A matrix giving these data is shown in Table 3. As an example of interpreting this matrix, consider the information given in the first row, which represents responses from students who, at the beginning of the semester, wished the course were optional so they could have taken something else. The entry in the total column of the first row indicates this represented 16% of the students. At the end of the semester, this 16% made the following choices: 8% (or half) were now fine with it being required, 7% wished it were optional for other reasons, and 1% still wished it were optional so they could have taken something else.

Table 3: Student Preferences: Required vs. Optional (74 students responding)

		End of Semester			
		Wish it were optional so could take something else	Wish it were optional for other reasons	Fine with it being required	**Total**
Beginning of Semester	Wish it were optional so could take something else	1%	7%	8%	16%
	Wish it were optional for other reasons	0%	1%	8%	9%
	Fine with it being required	7%	7%	59%	73%
	Total	8%	15%	75%	

Totals may not add to 100% due to rounding

It can be seen that the percent of students who were fine with the course being required changed only a little, increasing from 73% to 75% from the beginning of the semester to the end. The percent of students who wished they could have taken something else dropped from 16% at the start of the semester to 8% at the end. (Interestingly, most of the 8% came from the group who were fine with it being required at the beginning.) The number of students who wished it were optional for other reasons increased from 9% to 16%. A common reason for wishing it were optional was so team members would be fully committed to the team and project.

Implications

Partially based on concerns expressed by instructors that some students didn't want to be in the class, and partially to reduce the load the course put on the college, at one point several years ago college leaders suggested that departments make the course optional. Two departments have done so: Chemical Engineering (ChE) and Electrical and Computer Engineering (ECE). ChE has tried to distribute leadership topics throughout the existing curriculum and thereby still capture some of the material. They have decided to require a different GE course in the stead of EngT 231. ECE has made the course optional. Other units, so far, have decided to keep it as a mandatory course. Whereas for some time teaching evaluations for the course were below college averages, recently they have climbed to be above college averages. This is noteworthy given that relatively large sections are taught of lower division students, there are 6-8 instructors involved, and the course is required. A new college administration took over in 2016. They are inclined to let departments do what they wish with the course. The authors perceive that among the departments which are keeping the course, there is a growing appreciation that the material is important for students to learn if we wish for them to be leaders in their careers after they graduate. The authors also perceive, however, that instructors need to continue to emphasize why the class is relevant to students' education and to continue to refine assignments and activities which allow students to practice the concepts which are taught, i.e., to develop the skills which are being studied.

Summary

In this paper several measures were examined to try to understand how students feel about taking a required class in leadership. Students were surveyed at the beginning of the semester about their attitudes towards the class and the subject. During the semester a number students commented on their feelings about the class in their journals. At the end of the semester some of the students were asked directly how they felt about the class being required.

About 25% of the students at the beginning and end of the semester wished the class were optional for some reason, although the percent wishing it were optional so they could take something else dropped from 16% to 8%.

In general student attitudes regarding studying leadership were independent of whether they were required or elected to take the course. Both groups indicated they felt leadership could be learned, that it was somewhat more important than the skills of their major, and that they expected to learn a lot about leadership in the course. Overall, these results are encouraging. The challenge for the college is to fully meet these expectations.

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