AC 2012-4134: ENGINEERING FACULTY ATTITUDES TOWARDS SERVICE-LEARNING

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Gender and Tenure Effects on Engineering Faculty Attitudes toward Service-Learning

Abstract

We report on the attitudes towards and impacts of service-learning (S-L) within the College of Engineering at the University of Massachusetts Lowell, a medium-sized engineering college at a public university, with results differentiated by S-L implementation, gender and tenure status. The S-L program in question has been active for 7 years in the form of single semester projects relevant to the community and carried out by engineering students as a part of their required coursework, with approximately half of the faculty providing data via an annual survey on S-L attitudes, impacts and obstacles.

On average, respondents agree that S-L is beneficial to teaching and enhances the student experience. Respondents consider that S-L has increased satisfaction or enjoyment of teaching within their courses, as well as a sense of civic engagement among their students.

Female respondents tend to show greater agreement than male respondents as far as the value of S-L is concerned. This difference is significant with respect to the belief that S-L projects can meet course learning objectives while simultaneously being academically rigorous, as well as the beliefs that service is an integral part of the engineering profession and that students can become better citizens through S-L.

Tenure status did not affect attitudes concerning S-L. Rather, the most significant differences with respect to tenure status had to do with the impacts of S-L on teaching. In particular, untenured respondents reported greater increases in the use of student-led projects, time spent lecturing and personnel involvement in the community as a result of S-L.

Building on previous findings, the biggest barriers for implementing S-L into courses were related to faculty and student workload and time. Untenured respondents more frequently cited policy as a barrier, while female and untenured respondents more frequently cited faculty time and financial support as barriers. In contrast, class time was more frequently cited as a barrier by male respondents, while student time was more frequently cited as a barrier by male and tenured respondents. Faculty time was among the most cited barriers in all cases.

Overall, these results provide a clearer picture of the strengths of this program's implementation of S-L practices. They imply increased interest on the part of female faculty in particular, in support of the idea that service learning may serve as a means of encouraging female participation in engineering. Additionally, they highlight the concerns associated with S-L in general as well as specific to various constituencies, and identify areas that should be targeted for further improvement.

Introduction

SLICE (Service-Learning Integrated throughout a College of Engineering) is a college-wide program supported since 2004 by grants from the National Science Foundation and implemented

at the University of Massachusetts Lowell. “SLICE defines service-learning as a hands-on learning approach in which students achieve academic objectives in a credit-bearing course by meeting real community needs. In engineering the students become better professionals and better citizens while the community benefits”.[1]

The approach of SLICE is to integrate the service-learning (S-L) component into core credit-bearing courses (and not as elective courses as implemented by the EPICS[2] model for example). The SLICE program aims to offer at least one service-learning project per semester to every student in every department within the college of engineering (5 departments in total, approximately 80 full-time faculty). Throughout the development of this program, faculty members have been surveyed annually regarding both their conception of S-L and the impact of S-L on their teaching.

Faculty attitudes toward S-L have long been identified as an area where research is needed[3]. Engineering faculty attitudes have been the object of only a few reports though. Bauer et al[4] published a study on the attitude of 34 faculty with respect to the Humanitarian Engineering initiative at the Colorado School of Mines: they found that in general faculty had a more positive attitude to S-L projects than students, except with respect to career benefits. Paterson et al[5] reported the results of a national survey of faculty advisors as critical factors to the involvement of students in S-L. Most of the 100 surveyed faculty members were supportive of learning through service practice, thanks to the positive learning experience it provides to students; major cited barriers were lack of time, money and importance to promotion and tenure. Following the study of SLICE faculty through interviews and survey as published three years ago by Burack et al[6] and West et al[7], we report here the results of the 2011 surveys, 7 years after the program inauguration.

Description of Faculty and Overall Survey Results

The latest survey comprises the responses of 37 participants, including 6 female (16%) and 12 untenured (33%) faculty members. Those represent roughly half of the college of engineering faculty population, a level of response consistent with surveys from prior years. The survey is given in Appendix A.

Table 1 summarizes the overall answers of the engineering faculty respondents regarding their attitudes toward S-L. On average, respondents, whether they have practiced S-L or not, agree that it can be a benefit to their academic practice and can enhance the student experience throughout their studies. Respondents are neutral on the ability of S-L to attract and retain minority students in engineering fields, however. They also are neutral regarding whether S-L demands additional student time and effort. One of the goals of the SLICE project lies in offering an S-L experience to every student each semester of their curriculum; respondents agree with this particular goal, which sets SLICE apart from other models of S-L.

Table 1: 2011 Survey Results: Attitudes Toward S-L

Mean responses to Likert scale of 1 (disagree) to 5 (neutral) to 9 (agree)	N	Mean
a. With service-learning, it is possible to meet course learning objectives in a credit-bearing course while also meeting real community needs.	36	6.2*
b. When service-learning is done well, students learn the subject matter better than in a traditional classroom.	36	6.5*
c. With service-learning, students become better citizens.	36	6.4*
d. Service-learning can be an effective way to increase the involvement of women and other underrepresented groups in engineering.	35	5.5
e. Service-learning courses can be academically rigorous.	35	6.1*
f. Service in general should be an expected part of the engineering profession.	35	6.1*
g. I agree in principle with the goal of having at least one service-learning course available every semester for every undergraduate in our college of engineering.	35	5.7
h. It is possible to integrate service-learning into existing engineering courses without adding to the overall workload of students by replacing existing homework, projects, lab experiments, lectures, etc. with similar activities solving real problems in the community.	35	5.4
i. I chose engineering as a profession because of what I could do engineering to help people (extrinsic).	35	6.1*
j. I chose engineering as a profession because of the intrinsic enjoyment of engineering.	35	7.0*

*: Significantly different from Neutral

Table 2 represents the overall results of the surveys of the engineering faculty respondents on the impact of S-L on teaching. On average, respondents consider that S-L has increased awareness and engagement of the students in their class. The only item where respondents reported no significant change, on average, is in the amount of time they spend lecturing in their class or program. It is also interesting to observe that participation in S-L increased the faculty's belief that students can make a difference in their communities as well as their sense of pride in their institution. The only negative effect reported by a majority of faculty was an increase in the day to day workload of the faculty; it should be understood that the mean value of effect (j) is indicative of the strength of the overall faculty response, and not the actual increase in workload.

Table 2: 2011 Survey Results: Impact of SLICE on Teaching

How has S-L affected the following: (-4 = Strongly Decreased, 0 = No Change or don't know, +4 =Strongly Increased)	N	Mean
a. My knowledge of issues and resources in the community.	29	1.4*
b. My emphasis on community issue/problems in my class or program.	29	1.2*
c. My emphasis on the importance of examining public policy in teaching about community issues in my class.	29	1.0*
d. My use of student-led projects in my teaching.	29	1.3*
e. The amount of time I spend lecturing in my class or program.	29	0.4
f. My belief that students can make a difference in their communities.	29	1.7*
g. My personal commitment to improving the community.	29	1.5*
h. My enjoyment or satisfaction with teaching.	30	1.2*
i. My ability to address ABET outcomes in my teaching.	30	1.2*
j. My day-to-day workload.	30	1.0*
k. My sense that I am confident and capable as an educator.	30	0.9*
l. My sense of pride and satisfaction with the UML engineering program.	31	1.8*

*: Significantly different from "No Change" (0)

The survey also offered respondents the chance to rank perceived obstacles to implementing S-L in their course(s) (Figure 1). The most important barriers found in the survey relate to time and

workload. Faculty time / workload was the most frequently cited barrier, class time as second most frequent and student time / workload as third most frequent. These results match previous faculty surveys, as reported by Burack et al[6] for example.

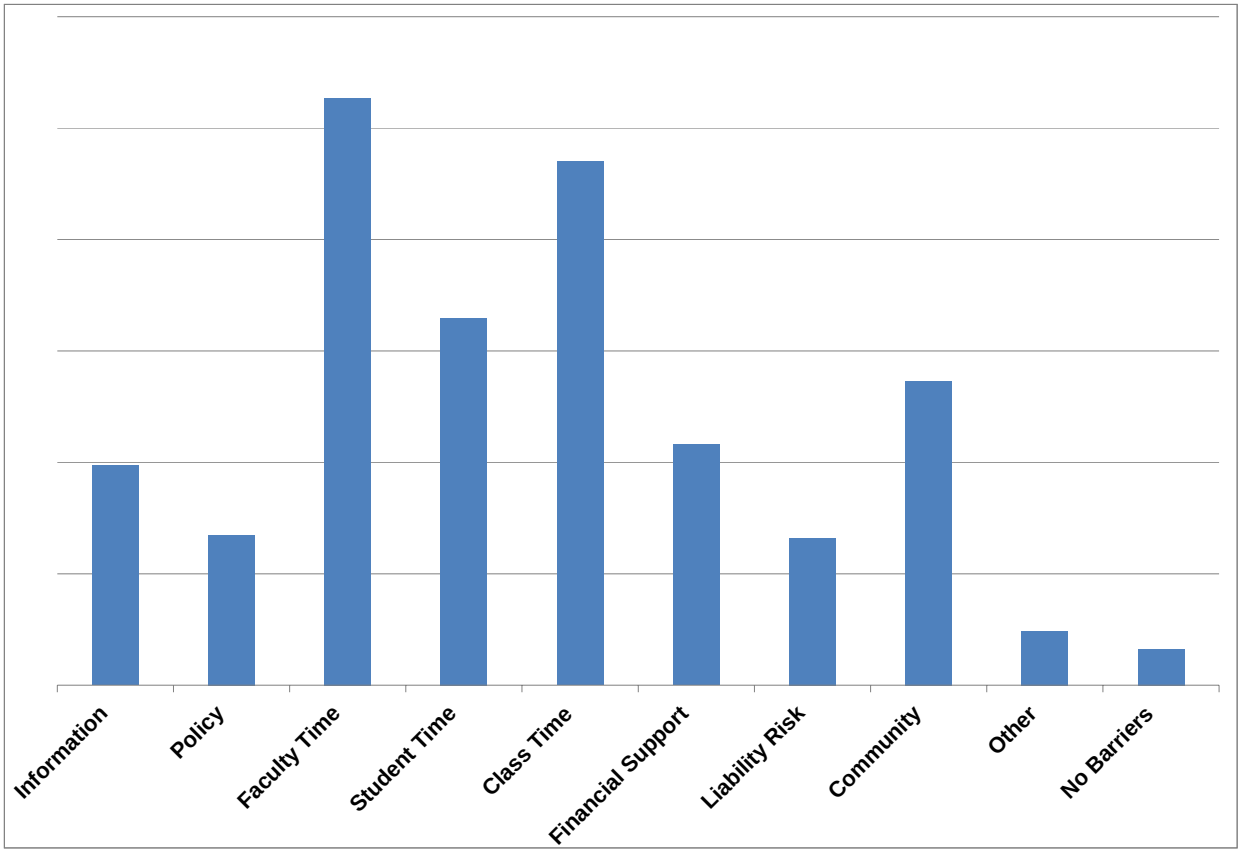

Figure 1: Obstacles to implementation of S-L (bar heights is related to the number of respondents citing an item as an obstacle)

Differentiating Results by Respondent Implementation

Within the surveyed population, 26% have never tried S-L and indicated that they would not try it, while 40% have tried and stopped, and 34% have and will continue to use S-L in their classroom. It is therefore important to try and diagnose the causes as to why faculty do not attempt or cease implementation of S-L in their courses. Accordingly, the survey data have been split with respect to the different three groupings of respondent implementation of S-L in their course(s).

Obstacles to implementing S-L, as identified by each of the aforementioned groups, are presented in Figure 2. Issues of faculty and student workload and time remain frequently cited barriers to S-L implementation independent of respondent practice, but cited substantially more frequently in the group of respondents that started but did not continue S-L. Such variations may explain the discrepancy between the result from Table 1 that the faculty respondents as a whole were neutral as to whether S-L demands more student time and effort and the result from Table 2 that the same group felt that demands on student time and effort represented a major obstacle to

S-L implementation. In particular, it may be that the respondents who tried but did not sustain S-L practices either have courses that are less amenable to S-L or engaged in S-L efforts too ambitious for a single semester.

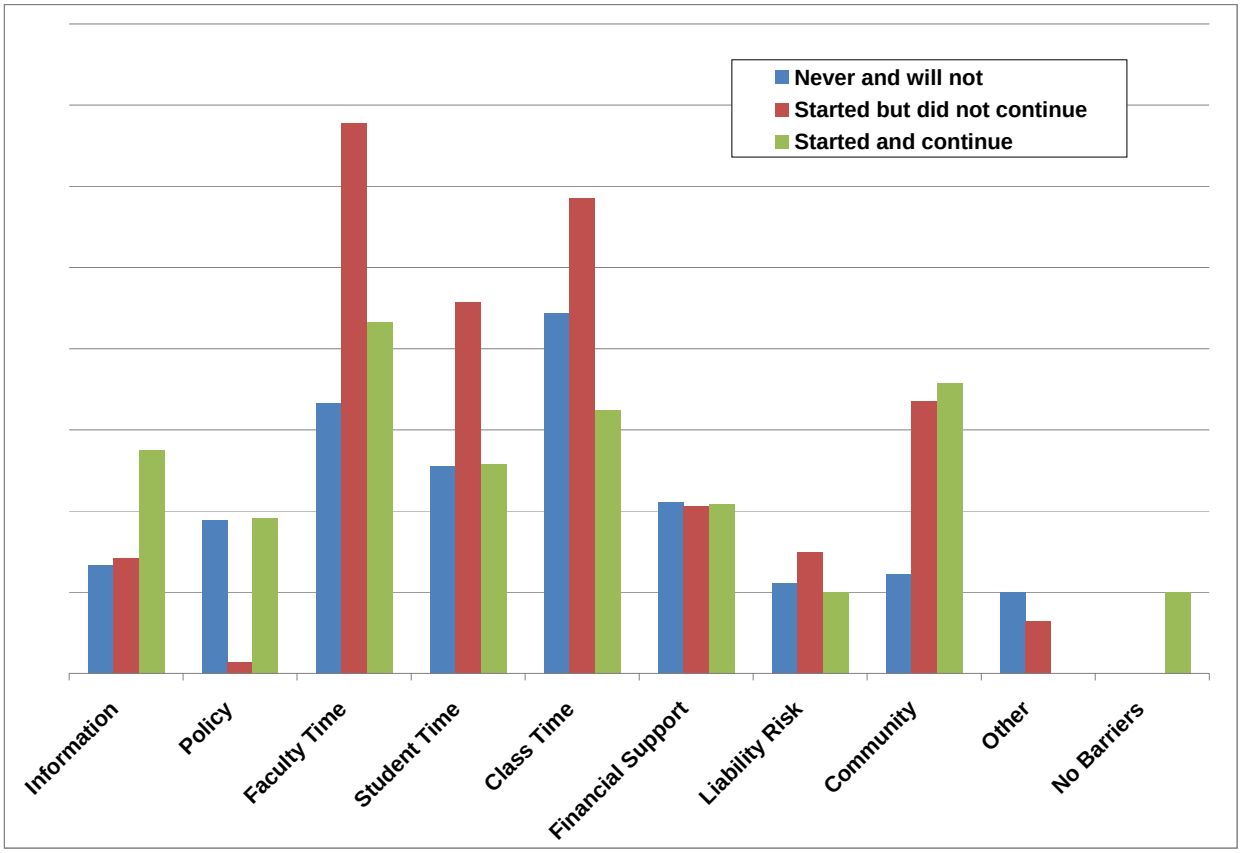

Figure 2: Obstacles to S-L implementation as a function of respondent practice

Interestingly, for respondents who continue to practice S-L, coordination with the community partner appears as the second most frequently cited barrier (above student workload / time and class time). Along the same lines, the groups that have attempted S-L uniformly cite coordinating with a community partner as a major obstacle much more frequently than the group that has never attempted S-L. These results identify several areas for further improvement, both in terms of course selection and project definition and also community coordination and communication.

In addition to the survey of major obstacles, the survey of attitudes and impacts has also been split with respect to respondent groupings. Table 3 and Table 4 present the items that show only statistically significant differences (at the 5% level in ANOVA tests) between the various groups of respondents. Regarding student workload, Table 3 indicates that respondents who continue to practice S-L are more likely to agree that student workload needs not increase as a result of S-L compared to faculty who have not practiced or have stopped practicing S-L.

Table 3: 2011 Survey Results: Attitudes Toward S-L, Differentiated by Practice

Mean responses to Likert scale of 1 (disagree) to 5 (neutral) to 9 (agree)	Practice	N	Mean	Std. Deviation
h. It is possible to integrate service-learning into existing engineering courses without adding to the overall workload of students by replacing existing homework, projects, lab experiments, lectures, etc. with similar activities solving real problems in the community.	never tried and won't try	8	5.0	1.9
	tried but stop	14	4.5	2.1
	tried and will continue	11	6.7	2.3

Table 4: 2011 Survey Results: Impact of SLICE on Teaching, Differentiated by Practice

How has S-L affected the following: (-4 = Strongly Decreased, 0 = No Change or don't know, +4 =Strongly Increased)	Practice	N	Mean	Std. Deviation
h. My enjoyment or satisfaction with teaching.	never tried and won't try	5	0.0	0.0
	tried but stop	14	1.3	1.3
	tried and will continue	11	1.6	1.8
i. My ability to address ABET outcomes in my teaching.	never tried and won't try	5	-0.6	1.3
	tried but stop	14	1.8	1.2
	tried and will continue	11	1.3	1.4
j. My day-to-day workload.	never tried and won't try	5	-0.8	1.8
	tried but stop	14	1.3	1.6
	tried and will continue	11	1.4	0.9

As for the impact of S-L on teaching, Table 4 indicates that all respondents who have attempted S-L recognize its positive effects on their enjoyment or satisfaction with teaching and their ability to address ABET outcomes, as well as an increase in their workload. The much higher variability in the responses of those who tried S-L and stopped compared to those who continued is noteworthy as well, in that it indicates a much broader distribution in perceived increases in faculty workload in the former group. Overall, these results are consistent with previous discussions concerning the obstacles to S-L identified by each group of respondents, and support

prior conclusions concerning the need to improve course selection and project definition as far as implementing S-L is concerned.

Faculty respondents were also asked to declare their intention of practicing S-L in their future courses; then these results were correlated with past practice. Of particular interest are the results for respondents who practiced S-L and then stopped. Within this group, 36% stopped after only one semester, highlighting a definite threshold effect as far as the implementation of sustainable S-L projects is concerned. Likewise, 21% of faculty stopped after 7 or more semesters of practice (with some faculty up to as many as 12 semesters), identifying the possibility of long-term S-L fatigue.

Finally, it is worthwhile to summarize and discuss comments from faculty respondents concerning the main reasons they had or had not implemented S-L in their course(s). Within the group of respondents who had never tried S-L, three mentioned the difficulty to find a strong match between community partner and subject matter. One mentioned the lack of training in S-L educational techniques. One junior faculty member indicated that time spent implementing S-L would not be rewarded as far as the tenure process was concerned, and was therefore difficult to justify.

Among the respondents that tried S-L and stopped, most recognized the personal enjoyment or satisfaction of implementing S-L practices and the positive impact it had on their students. Funding, faculty time and insufficient staff and teaching assistant support were the major obstacles to sustaining S-L in their courses. One faculty member emphasized that it was not possible to define sufficiently rigorous S-L projects in the context of the subject matter.

Finally, among the respondents that continued to practice S-L, most highlighted the ability of S-L to enhance student experience and motivation and push students to confront real-world issues. The major issues identified were coordination and communication with community partners and lack of clear objectives.

Effect of Gender

In order to avoid biasing the data based on the views of large numbers of respondents who had not tried S-L, this group as a whole was initially excluded from the analysis. As this resulted in the inclusion of too few female respondents to allow for proper differentiation by gender, however, data from female respondents who had not tried S-L was re-introduced into the analysis. Table 5 presents those responses where a statistically significant difference (at the 5% level in t-tests) was observed as a function of gender.

Table 5: 2011 Survey Results: Attitudes Toward S-L, Differentiated by Gender

Mean responses to Likert scale of 1 (disagree) to 5 (neutral) to 9 (agree)	Gender	N	Mean	Std. Deviation	Std. Error Mean
a. With service learning, it is possible to meet course learning objectives in a credit-bearing course while also meeting real community needs.	Male	22	5.7	2.6	0.6
	Female	6	8.5	0.8	0.3
c. With service-learning, students become better citizens.	Male	22	5.9	2.8	0.6
	Female	6	8.2	1.6	0.7
e. Service-learning courses can be academically rigorous.	Male	21	6.0	2.8	0.6
	Female	6	7.0	1.3	0.5
f. Service in general should be an expected part of the engineering profession.	Male	21	5.4	2.7	0.6
	Female	6	8.3	0.8	0.3
g. I agree in principle with the goal of having at least one service-learning course available every semester for every undergraduate in our college of engineering.	Male	21	5.2	2.8	0.6
	Female	6	7.7	1.8	0.7

For results other than those shown in Table 5, the female respondents were consistently more likely to agree than the male respondents, but the difference was not statistically significant. Of the statistically significant differences, female respondents were more likely to believe that S-L projects would be able to meet course learning objectives while remaining academically rigorous. Female respondents were also more likely to view S-L projects as pathways to better student citizenship and to agree that service should be an expected part of the engineering profession. Finally, female respondents were more likely to agree that S-L projects should be available every semester for every undergraduate. In contrast, the results concerning the impact of SLICE on teaching were statistically indistinguishable as a function of gender. Finally, in addition to attitudes and impacts, obstacles to S-L implementation were also differentiated with respect to gender, as presented in Figure 3.

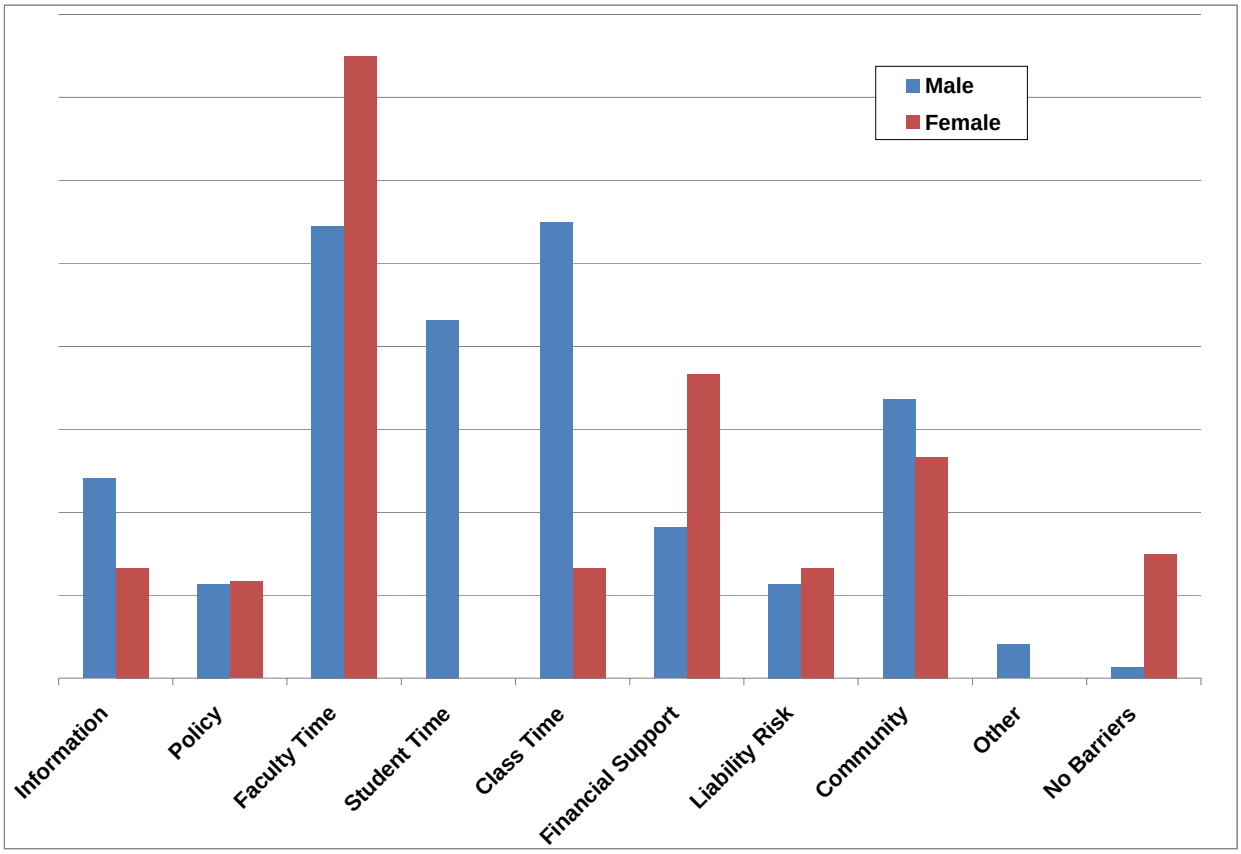

Figure 3: Obstacles to S-L implementation as a function of gender

The largest differences in the data relate to student and class time, with male respondents identifying these issues as obstacles much more frequently than female respondents. The gender differentiation as far as student time is concerned is particularly large, with only male respondents identifying student time as an obstacle. The next most significant differences observed concerned faculty time and financial support, which were identified as obstacles more frequently by female respondents than male respondents. That said, there was overall agreement with respect to faculty time, this being the most cited obstacle by female respondents and the second most cited obstacle by male respondents. The frequency of citation of the remaining obstacles was not strongly differentiated by gender, except that female respondents were more likely to indicate no barriers to S-L implementation than male respondents. This is consistent with the finding that female respondents reported more positive attitudes towards S-L.

Very significant differences by gender in student attitudes towards S-L have also been found in the SLICE program[8,9].

Effect of Tenure

The respondents who had not tried S-L were excluded from the analysis on tenure differentiation. Tenure status did not affect attitudes towards S-L in a statistically significant fashion. Rather, the most significant differences with respect to tenure status related to the

impacts of SLICE on teaching. Table 6 presents those responses where a statistically significant difference (at the 5% level in t-tests) was observed as a function of tenure status.

Table 6: 2011 Survey Results: Impact of SLICE on Teaching, Differentiated by Tenure Status

How has S-L affected the following: (-4 = Strongly Decreased, 0 = No Change or don't know, +4 =Strongly Increased)	Tenure	N	Mean	Std. Deviation	Std. Error Mean
d. My use of student-led projects in my teaching.	No tenure	6	2.8	0.4	0.2
	Tenure	16	1.1	1.7	0.4
e. The amount of time I spend lecturing in my class or program.	No tenure	6	2.2	1.3	0.5
	Tenure	16	-0.4	1.8	0.5
g. My personal commitment to improving the community.	No tenure	6	2.3	0.5	0.2
	Tenure	16	1.4	1.4	0.4

The survey results indicate that untenured respondents perceived a greater increase in their use of student-led projects in their teaching as a result of S-L than their tenured colleagues, as well as a greater increase in the amount of time spent lecturing and in their personal commitment to improving the community. In addition to impacts on teaching, the obstacles to S-L implementation have also been split with respect to tenure status, with the results presented in Figure 4.

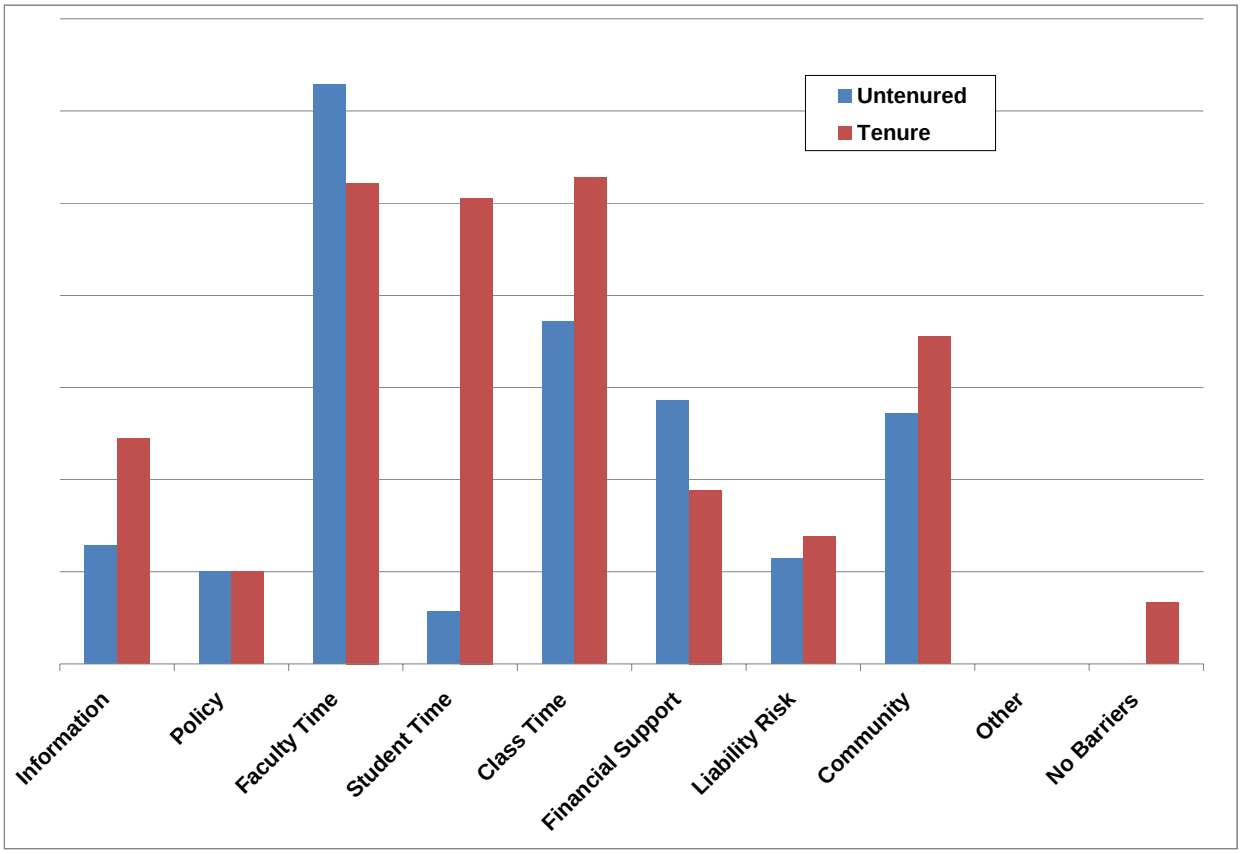

Figure 4: Obstacles to S-L implementation as a function of tenure status

The data show that untenured respondents most frequently identify faculty time as a barrier to S-L implementation, whereas tenured respondents identify class time most frequently. These tendencies are similar to those observed in past surveys. Untenured respondents were much more likely to cite policy, faculty time and financial support as obstacles. Frequent citation of policy and faculty time among untenured respondents is consistent with concerns expressed in respondent comments regarding S-L and tenure.

In contrast, tenured respondents were much more likely to cite student time as an obstacle. As noted previously only male respondents identified student time as a major obstacle (Figure 3), implying a much greater proportion of male respondents in the tenured group and confirming the demographic effect noted above. Previously presented results also show that student time is cited with much greater frequency among those respondents who tried S-L and stopped (Figure 2).

Respondent Recommendations

In addition to previously discussed quantitative survey results, the surveys also included a qualitative section regarding how the S-L team could assist faculty. The responses to this portion of the survey are summarized below.

Several respondents expressed the needs for assistance incorporating S-L into their course(s), both in terms of identifying community partners and defining realistic, achievable projects. One

respondent commented on the fact that students were frustrated by the lack of feedback from the community partner, implying a need to assist with communication as well. An attempt to address some of these issues was made in 2009 through the introduction of an annual "S-L Community Connections Breakfast", a forum designed to connect community partners with faculty and initiate a dialogue. The full-time SLICE coordinator plays a critical role in the organization of this event as well as the follow-up.

Along the same lines, several untenured respondents expressed the need for training in best practices as far as practical S-L implementation is concerned. The reintroduction of half-day faculty development seminars along these lines has been proposed to assist in this process.

Several respondents raised the issue of funding, either in the form of teaching assistants support for implementation of S-L or as a faculty stipend. Both were initially offered to faculty when the SLICE project was inaugurated within the college of engineering, but were not budgeted in subsequent grants. As it is not currently addressed, the issue of intrinsic faculty motivation regarding S-L must be revisited to ensure the sustainability of S-L practice. Along the same lines and echoing prior discussions, one respondent mentioned the lack of consideration of S-L involvement in the tenure and promotion process as a major obstacle to its implementation. Unfortunately, this structural issue, while it should be addressed, is beyond the scope of the SLICE effort[10].

Conclusions

We report on the attitudes toward and impacts of S-L within the College of Engineering at the University of Massachusetts Lowell, with results differentiated by S-L implementation, gender and tenure status. The S-L program in question has been active for 7 years in the form of single semester projects relevant to the community and carried out by engineering students as a part of their required coursework, with approximately half of the faculty providing data via an annual survey on S-L attitudes, impacts and obstacles. Overall, the different populations of respondents agree that S-L can be beneficial to teaching and can enhance the student experience. Respondents consider that S-L has increased satisfaction or enjoyment of teaching within their courses, as well as a sense of civic engagement among their students.

Female respondents tend to show greater agreement than male respondents as far as the value of S-L is concerned. This difference is significant with respect to the belief that S-L projects can meet course learning objectives while simultaneously being academically rigorous, as well as the beliefs that service is an integral part of the engineering profession and that students can become better citizens through S-L.

Tenure status did not affect attitudes concerning S-L. Rather, the most significant differences with respect to tenure status had to do with the impacts of S-L on faculty teaching and student work loads. In particular, untenured respondents reported greater increases in the use of student-led projects, time spent lecturing, and personal involvement in the community as a result of S-L.

Building on previous findings, the biggest barriers for implementing S-L into courses were related to faculty and student workload and time. Untenured respondents more frequently cited

policy as a barrier, while female and untenured respondents more frequently cited faculty time and financial support as barriers. In contrast, class time was more frequently cited as a barrier by male respondents, while student time was more frequently cited as a barrier by male and tenured respondents. Increased faculty workload was among the most cited barriers in all cases.

Overall, these results provide a clearer picture of the strengths of the SLICE program's implementation of S-L practices. They imply increased interest on the part of female faculty in particular, in support of the idea that service learning may serve as a means of encouraging female participation in engineering. Additionally, they highlight the concerns associated with S-L in general as well as specific to various constituencies, and identify areas that should be targeted for further improvement. As a result of this study, areas targeted for further improvement include coordination of courses, project definition, and community participation. Ongoing efforts to assess student perceptions and outcomes in the SLICE program will be described in a future report.

Acknowledgements
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Appendix A. Survey instrument For Faculty.

Faculty Survey on Service-Learning

Date: _____

Your responses will form an important part of research into the effectiveness of service-learning here. You may elect not to answer any question you choose. All responses will remain confidential, and anonymity in any reported results is assured. Filling out this questionnaire is completely voluntary, and you will not be penalized in any manner if you decide not to participate. Thanks from the SLICE project, UML College of Engineering.

1. Gender: __ Male __ Female 2. I have tenure: Yes _____ No _____

3. Please check your department:

☐ Chemical ☐ Electrical & Computer ☐ Mechanical
☐ Civil & Environmental ☐ Engineering Technology ☐ Plastics

Service-learning is a hands-on learning approach in which students achieve academic objectives in a credit-bearing course by meeting real community needs. In engineering the students become better professionals and better citizens while the community benefits. The aim of **SLICE** is to integrate service-learning into existing courses without increasing the overall workload of students.

	Yes (check all that apply)	
4. I incorporated service-learning into at least one of my courses	❍ Fall 2004	❍ Spring 2005
	❍ Fall 2005	❍ Spring 2006
	❍ Fall 2006	❍ Spring 2007
	❍ Fall 2007	❍ Spring 2008
	❍ Fall 2008	❍ Spring 2009
	❍ Fall 2009	❍ Spring 2010
	❍ Fall 2010	❍ Spring 2011

5. I plan to incorporate service-learning into at least one of my courses: ❍ Fall 2011
❍ Spring 2012

6. What are the main reasons you have, or have not, tried service-learning in your course(s)?

7. Please rank order the barriers to integrating service-learning into your course(s) {**1** being the biggest barrier}:
___ lack of information on how to implement service-learning successfully
___ no clear policy on the place of service-learning in promotion and tenure
___ faculty time/ workload
___ student time/workload
___ limited amount of class time
___ financial support
___ liability risk
___ problems coordinating with the community
___ other _____.
___ no barriers encountered

8. Through SLICE, I have participated in the following (please check all that apply):
- ❍ Attended a lunch time seminar
- ❍ Worked with Linda Barrington and/or faculty service-learning coordinators to establish a suitable service-learning project
- ❍ Received a course release to incorporate service-learning into my course(s).
- ❍ Received a stipend
- ❍ Received help from a SLICE RA
- ❍ Borrowed service-learning materials from the SLICE office
- ❍ Revised my syllabus to include a service-learning component for the first time
- ❍ Other (specify) _____
- ❍ None

A: Attitudes About Service-Learning

The items below are intended to reveal perceptions of service-learning and levels of interest. Please respond below based on your honest reaction to each item. Please choose the answer that makes sense to YOU; not what you think others would say.

[*1= Strongly Disagree, 5=Neutral or don't know, 9=Strongly Agree*]

a. With service learning, it is possible to meet course learning objectives in a credit-bearing course while also meeting real community needs.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
b. When service-learning is done well, students learn the subject matter better than in a traditional classroom.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
c. With service-learning, students become better citizens.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
d. Service-learning can be an effective way to increase the involvement of women and other underrepresented groups in engineering.	1	2	3	4	5	6	7	8	9

[*1= Strongly Disagree, 5=Neutral or don't know, 9=Strongly Agree*]

e. Service-learning courses can be academically rigorous.	1	2	3	4	5	6	7	8	9
f. Service in general should be an expected part of the engineering profession.	1	2	3	4	5	6	7	8	9
g. I agree in principle with the goal of having at least one service-learning course available every semester for every undergraduate in our college of engineering.	1	2	3	4	5	6	7	8	9
h. It is possible to integrate service-learning into existing engineering courses without adding to the overall workload of students by replacing existing homework, projects, lab experiments, lectures, etc. with similar activities solving real problems in the community.	1	2	3	4	5	6	7	8	9
i. I chose engineering as a profession because of what I could do with engineering to help people (extrinsic.)	1	2	3	4	5	6	7	8	9
j. I chose engineering as a profession because of the intrinsic enjoyment of engineering.	1	2	3	4	5	6	7	8	9

B. SLICE's (Service-Learning Integrated into a College of Engineering) Impact on You
We would also like to know how SLICE has affected you. For each of the following, please indicate the extent to which the item has ***Increased, Decreased***, or if there has been ***No Change*** as a result of SLICE.

How has SLICE affected the following:

[-4 = Strongly Decreased, 0 = No Change or don't know, +4 = Strongly Increased]

a. My ***knowledge of issues and resources*** in the community	-4	-3	-2	-1	0	+1	+2	+3	+4
b. My ***emphasis on community issue/problems*** in my class or program	-4	-3	-2	-1	0	+1	+2	+3	+4
c. My ***emphasis on the importance of examining public policy*** in teaching about community issues in my class	-4	-3	-2	-1	0	+1	+2	+3	+4
d. My ***use of student-led projects*** in my teaching	-4	-3	-2	-1	0	+1	+2	+3	+4
e. The ***amount of time I spend lecturing*** in my class or program	-4	-3	-2	-1	0	+1	+2	+3	+4
f. My belief that students ***can make a differenc***e in their communities	-4	-3	-2	-1	0	+1	+2	+3	+4
g. My ***personal commitment to improving the community***	-4	-3	-2	-1	0	+1	+2	+3	+4

[-4 = Strongly Decreased, 0 = No Change or don't know, +4 = Strongly Increased]

h. My ***enjoyment or satisfaction*** with teaching	-4	-3	-2	-1	0	+1	+2	+3	+4
i. My ability to address ***ABET outcomes*** in my teaching	-4	-3	-2	-1	0	+1	+2	+3	+4
j. My ***day-to-day workload***	-4	-3	-2	-1	0	+1	+2	+3	+4
k. My sense that I am ***confident and capable*** as an educator	-4	-3	-2	-1	0	+1	+2	+3	+4
l. My sense of ***pride and satisfaction*** with the UML engineering program.	-4	-3	-2	-1	0	+1	+2	+3	+4

What can SLICE do to assist you in integrating service-learning into your class(es)?

General Comments:

Thank you!