Suzanne & Richard Pieper Family Foundation
Endowed Chair for Servant Leadership

College of Engineering

UNIVERSITY OF WISCONSIN–MADISON

Annual Report
January 2013

CONTENTS

New Servant Leader Chair for the UW-Madison College of Engineering

Professor Jeff Russell, Pieper Family Foundation Servant Leader Chair beginning in December 2008, accepted an appointment as the Vice-Provost for Life-Long Learning and Dean of the Division of Continuing Studies at the University of Wisconsin – Madison in June 2011. Because his commitments to that position were a significant distraction for his appointment as the Servant-Leader Chair, Professor Russell asked the Dean of the College of Engineering to identify and name a successor as the new Servant-Leader Chair in May 2012. Professor Greg Harrington was named to serve as the new Servant-Leader Chair in June. Professor Harrington's two-page curriculum vitae is provided in Appendix A and a summary of his relevant activity is provided here.

Professor Harrington has been in the Department of Civil and Environmental Engineering since August 1996. He has served in a number of leadership roles during his career, and has served as the department's Associate Chair for the Undergraduate Program since May 2007. Greg developed the assessment process to measure attainment of undergraduate student outcomes and used that process to lead the department to the undergraduate program's re-accreditation in November 2012. He was also a member of the Madison Water Utility Board from September 2000 to September 2011, and served as president of the board from September 2009 to September 2011. As president of the board, Greg led a two-year effort to implement the policy governance model – an organizational leadership model with principles that overlap many of those incorporated within servant leadership. He has presented this work to national-level water utility conferences in Washington DC and Miami FL. He has also served as advisor for the domestic projects group of the Engineers Without Borders student chapter since 2008. This group has designed and installed a drainage system to mitigate flooding in a cemetery at the northern Wisconsin reservation for the Red Cliff Band of Lake Superior Chippewa.

Since beginning as the Servant Leader Chair, Professor Harrington has connected with Chris Carlson-Dakes and the staff in the college's Student Leadership Center, the principal individuals involved in leadership education within the College of Engineering. His primary emphasis has been to develop a strong understanding of the status quo so that he can provide the support needed to continue program development. In addition to this, Greg has joined the monthly meetings of the campus-level servant-leader discussion group and has attended Dr. Carlson-Dakes' fall semester lectures of Interdisciplinary Engineering 103 – Core Competencies for Engineering Leaders. He and Dr. Carlson-Dakes have also become mentors for the Chancellor's Scholar Program, which was established to create educational opportunities for academically talented underrepresented minority students and has a philosophy of "excellence in leadership, scholarship, and service." Professor Harrington has also become a founding member of the new Advisory Board for the student chapter of Engineers Without Borders.

Criterion 1 – Outcomes Baseline Data

Typical Thinking that Goes into Evaluating the Criterion

"The servant leader chairs, with the exception of one, established this criteria before the chair was awarded, expressed in the form of a graph. In all cases this has been done through standard student surveys that the school was already conducting. From those surveys, questions were selected that represent the values, characteristics, actions, and involvement of someone representative of a servant leader. Institutions were asked to plot this going back five or six years as a baseline. The document established the database that will then be used in the future. The alumni portion of this is more elusive and each school has its own unique process. Whatever the benchmark that is established for the school, it's compared historically going back as many years as possible both for the school and their peers in other schools, which is then continued each year in the future. This is a one-time award."

Year 2012 Progress

As noted in previous reports, we continue to track data in the senior exit survey that is administered by Educational Benchmarking Inc (EBI). Our baseline data is from the 2007-08 academic year, the year prior to the one in which the college received the Pieper Family Foundation award. Our analysis of data since the baseline year is presented in our section on Criterion 3.

Year 2013 Goals

Please see our discussion of Criteria 3 and 4.

Criterion 2 – Baseline Acceptance of Servant Leadership

Typical Thinking that Goes into Evaluating the Criterion

"Clear indication that the school is functioning with the qualities of a servant leader; building community, listening, awareness, stewardship, conceptualization and foresight, commitment to the growth of people and empathy. Displayed in multiple examples of what the school is actually doing will validate this area. It is not unusual that the institutions that receive the Chair already have these types of programs underway. If they are of substantive magnitude, both locally, community, nationally, and internationally, one could expect to receive this one-time award."

Year 2012 Progress

Since our initial report for Year 2008, we have continued to refine our approach, increase our participation, and expand our involvement across campus in servant-leadership activities. Most notably, we have advanced from learning about servant-leadership toward a deeper adoption and

commitment to the servant-leader model by aligning it with the broader college and campus commitments to the Social Change Model of leadership development. This is evident in our integration of servant-leadership into offerings that were already present in 2008, by creating new curriculum and courses over the last four years, and by expanding our involvement at a campus level in the last two years. Specific examples will be further presented in our section on Criterion 6.

Year 2013 Goals

Please see our discussion of Criterion 6.

CRITERION 3 – OUTCOMES MEASURES ABOVE DEMOGRAPHIC NORMS

Typical Thinking that Goes into Evaluating the Criterion

Measuring each year what was established in Criterion 1. The baseline data graphs represented in Criterion 1 are updated, both the peer group and the school. If this is considered qualitative data in the minds of the foundation, they will receive an award. If the alumni data is missing, the award will not be made at maximum. If the norms in the institution are reasonably above average, one can expect a higher level award. If there are things missing, one can expect a lower level.

Year 2012 Progress

In prior annual reports, we have appended all of the data from our annually-administered senior exit survey without any discussion of which items were of particular relevance to the servant-leader chair. Rather than provide all of the data for this report, we summarize and discuss the results of those questions that have particular relevance to leadership education. We also provide a comparison of our student perceptions with the perceptions of students at peer universities.

The senior exit survey is administered by Educational Benchmarking Inc (EBI) and is taken by seniors at numerous engineering programs across the nation. This allows us to compare the perceptions of our students with the perceptions of students at other engineering programs. For each academic year, we receive the mean response for engineering students from UW-Madison, for engineering students within participating Carnegie peer group programs (research intensive universities), and for engineering students from all programs that participate in the exit survey.

We use statistical analysis to determine:

- whether our students' perceptions are significantly better or worse than perceptions of students at our peer programs, and
- if our students' perceptions are improving or declining with time.

Because a change in educational practice will generally take four to six years to be observed in a senior exit survey, we evaluate the above items over four to six year time intervals.

We selected the following nine questions to analyze for this report:

1. Satisfaction with value derived from team experiences.
2. Satisfaction with value of engineering program student organization activities.
3. Satisfaction with leadership opportunities in engineering program extracurricular activities.
4. Satisfaction with your fellow students' ability to work in teams.
5. Satisfaction with your fellow students' level of camaraderie.
6. Degree that engineering education enhanced ability to function on multidisciplinary teams.
7. Degree that engineering education enhanced ability to understand ethical responsibilities.
8. Degree that engineering education enhanced ability to understand professional responsibilities.
9. Degree that engineering education enhanced ability to recognize need to engage in lifelong learning.

An example of the data is provided in Figure 1 for the third question in the above list: "satisfaction with leadership opportunities in engineering program extracurricular activities." This figure shows our students' satisfaction with leadership opportunities and compares their mean satisfaction level with the mean satisfaction level of students at other engineering institutions. The scale on the y-axis has a minimum value of 1 (very dissatisfied) and a maximum value of 7 (very satisfied). The remaining data are provided in Appendix B.

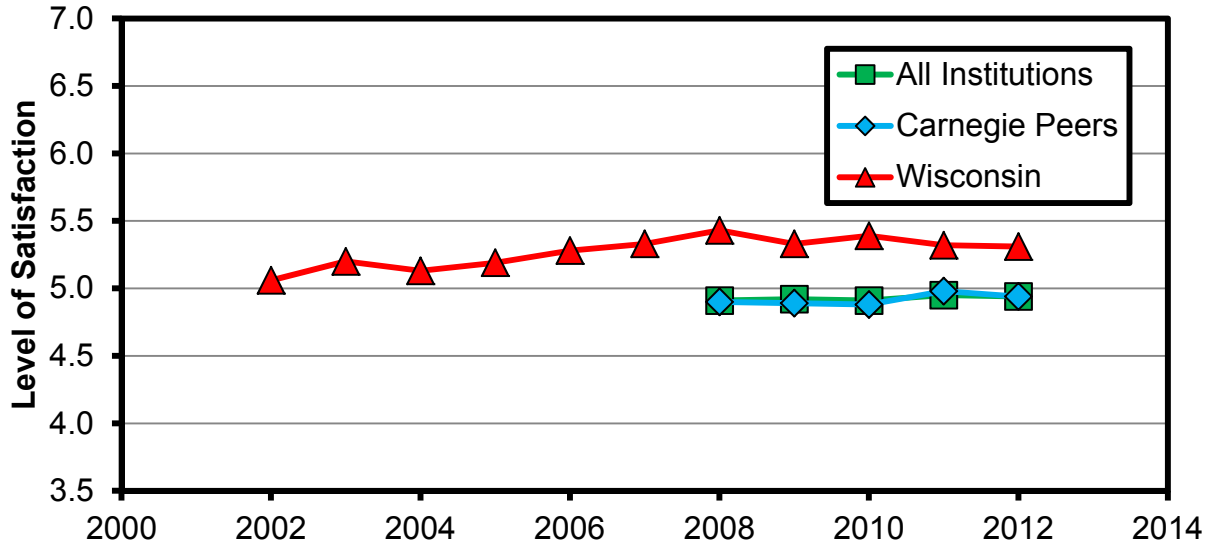

Figure 1. Mean level of satisfaction with leadership opportunities in engineering program extracurricular activities. The x-axis is organized on an academic year basis, so that 2012 refers to the 2011-12 academic year. The Pieper Servant-Leader Chair at the UW-Madison College of Engineering began in the 2008-09 academic year.

For the time period from 2006-07 through 2011-12, there was no statistically significant improvement or decline in UW-Madison student perceptions of leadership opportunities. However, for the same time period, statistical analysis showed that UW-Madison students had a significantly better perception of leadership opportunities at UW-Madison than did peer students of their own institutions.

When considering the other questions in the same manner, we reached the following conclusions from the EBI survey:

- Our students had significantly better perceptions of the following items than students at EBI-participating Carnegie peer institutions and at all EBI-participating institutions:
  - Satisfaction with value derived from team experiences.
  - Satisfaction with value of engineering program student organization activities.
  - Satisfaction with leadership opportunities in engineering program extracurricular activities.
  - Degree that engineering education enhanced ability to recognize need to engage in lifelong learning.
- Our students had significantly poorer perceptions of the following item than students at EBI-participating Carnegie peer institutions and at all EBI-participating institutions:
  - Degree that engineering education enhanced ability to understand ethical responsibilities
- Student perceptions significantly improved for the following items:
  - Degree that engineering education enhanced ability to understand ethical responsibilities (this is important since it shows we are making progress on the deficiency just noted)
  - Degree that engineering education enhanced ability to understand professional responsibilities

Year 2013 Goals

The measures we have implemented since 2006-07 have targeted a relatively small subset of the students in the College of Engineering. For example, our two leadership courses have annual enrollments of fewer than 100 students per year and their enrollment represents less than 10 percent of the students who enter the college on an annual basis. This makes it difficult to make a substantial impact on college-wide senior exit survey data. Our goals for Year 2013 are to brainstorm strategies for reaching a wider audience within the college.

Specific to the freshman course, we have begun a database of alumni (approximately 50) who have agreed to be involved in the course. Over time, this number will grow, and their level of involvement will evolve. Additionally, the use of undergraduate student assistants to teach the course further embeds servant leadership principles and practices with a core group of juniors and seniors who are poised to move into the workplace in the near future. As the course grows, this core of upper class students will also grow. Two of the undergraduate instructors for the spring 2013 offering took the course when they were freshmen and are returning to serve as leaders and instructors in the course next semester.

We also hope to expand our approach to measuring attainment of Criterion 3 and look forward to the Foundation's thoughts on each of the following possibilities:

- The EBI senior-exit survey measures student perception and does not include a direct assessment of leadership-oriented outcomes. In other words, the survey does not ask a third party to assess whether students actually achieved the outcome they have perceived to achieve. All programs in the college have recently included such an assessment in their individual efforts to gain ABET accreditation within the past year. The college's technical communications group has been collecting data on whether students meet or exceed expectations on outcomes such as knowledge of ethical and professional responsibility and the need for lifelong learning. To date, this data is organized on an individual program basis but we may have the ability to organize it on a college-wide basis. One drawback to this data is that we cannot compare the data to peer institutions because that data is not available.

- The EBI senior-exit survey is primarily oriented to measuring educational outcomes and does not ask other pertinent questions such as whether a student participated in service-oriented activities. The university periodically participates in the National Survey of Student Engagement (http://apir.wisc.edu/students-surveys.htm), which asks freshmen and seniors to answer questions that have been studied by our servant-leader peers at the Milwaukee School of Engineering and Lawrence College in their annual reports. Examples include whether students have participated or plan to participate in community service or volunteer work, and whether UW-Madison has contributed to students' ability to contribute to their community. On a campus-wide basis, we know that 73 percent of our responding students have participated in community service or volunteer work, which compares with 64 percent of students at our Carnegie peer institutions. We also know that 18 percent of the students who responded to the survey were engineering students. We plan to work with the UW-Madison Office of Academic Planning and Analysis to determine if we can evaluate the data specifically for engineering students.

Criterion 4 – Outcomes Measures Phenomenally Above Demographic Norms

Typical Thinking that Goes into Evaluating the Criterion

If Criterion 3 is profoundly above the norms and a result of the program indicates that they are continuing to track in that way, you can expect awards at this level. For example, on a scale of 1-10, a typical peer institution might be a 4 or 5. A typical institution that would have been considered for a chair might be a 6. Phenomenal performance might be an 8 or a 9. We would expect eventually most of the institutions will be tracking at a 9, which would tend to maximize this award.

Year 2012 Progress

The primary distinction between Criteria 3 and 4 is whether outcomes measures are above demographic norms or phenomenally above demographic norms. In our section on Criterion 3, we described how our students perceive our college relative to how other students perceive their colleges. While we have shown that our students perceive items such as leadership opportunities to be above demographic norms (Criterion 3), we defer to the foundation's judgment on whether these perceptions are phenomenally above demographic norms (Criterion 4). As an example, the database used for Criterion 3 is based on a scale of 1 to 7. Converting this to a scale of 1 to 10, our Year 2011-12 scores were in the range of 7.4 to 8.2, an improvement above our Year 2007-08 scores of 7.1 to 8.0. For comparison, our peer institutions' students had perceptions ranging from 6.8 to 8.1 in the baseline year and from 6.9 to 8.0 in Year 2011-12. As noted in our section on Criterion 3, we had a statistically significant improvement in scores for ethical and professional responsibility from the baseline year to the Year 2011-12. On the 1 to 10 scale, these scores improved from 7.1 to 7.4 and from 7.5 to 7.7, respectively. While our scores are certainly at or near the level of 8 noted by the foundation for Criterion 4, the peer institution averages of 6.9 to 8.0 are significantly higher than the 4 to 5 range noted for Criterion 4.

Year 2013 Goals

As noted above, the primary distinction between Criteria 3 and 4 is whether outcomes measures are above demographic norms or phenomenally above demographic norms. Thus, our goals for Criterion 4 are similar to those already stated for Criterion 3. As noted in Criterion 3, we look forward to the Foundation's thoughts on the use of additional metrics for these two criteria. If the Foundation and the other Servant-Leader Chairs are interested, we would like to engage in a discussion of how to measure demographic norms in the coming year.

Criterion 5 – Breakthrough Venture Promising New Beginnings in Acts of Goodness

Typical Thinking that Goes into Evaluating the Criterion

We are attempting to encourage the institution, its faculty and student body to think beyond their envelope, searching for new ways of networking and collaboration, whole new approaches to enrichment and effectiveness. This is not about ideas, it is about validated actions. If those actions include the institution, the community it lives in, the world it lives in nationally and internationally, and they are phenomenally above it or have exhibited a breakthrough and others are following, this would be a max award. If they have something that is really promising and covers all those areas, it might be on the lower end of the scale. An activity that has some promise will likely receive a rating of "1" while an activity that is transformational or systemic will likely receive a rating of "3." An activity that is both transformational and systemic – the ideal synergistic nurturing – may receive a rating of "5."

Year 2012 Progress

This criterion recognizes validated actions at the individual, institutional, community, and global levels. This year, we continued to refine last year's pilot Engineering Leadership course that uses Servant-Leadership as a foundational model. The course expanded from the original enrollment of 22 students last year and has reached the maximum enrollment limit of 35 with a waiting list for Spring 2013. The course was created by Dr. Carlson-Dakes, whose curriculum vitae is provided in Appendix A.

In June 2013, the course is being publicized at a national level via a presentation at the national conference for the American Society of Engineering Educators (ASEE) in Atlanta. The material is also being published in the conference proceedings. Dr. Carlson-Dakes, lead instructor for the course, and Dr. Harrington co-authored the paper that summarizes the course structure and model of leadership development founded on principles of Servant-Leadership. The paper provides a framework for how other institutions can adopt this model for implementation on their campus and concludes with a call to do so. The abstract and current draft of the paper can be found in Appendix C.

In the first three course offerings, more than 80 students have participated in nearly 50 community service projects. This past fall semester alone, 35 undergraduate students volunteered at least 400 hours, raised $750, had direct interactions that served at least 75 people, and served 11 local organizations with much broader reach into our community. A complete listing of projects is included in Appendix D.

On a more individual level, recall from last year's report our highlighted story of "Diana" – a first year student from South America who was enrolled in the new Engineering Leadership course. Her ability to enroll in the course, and the small group impact it had on her was a direct result of Pieper Foundation support. Her interest in pursuing Biomedical Engineering was motivated by her experience in her home country and her awareness of the prevalence and challenges of amputees in her community. Diana wanted to put her engineering education to use in service to others in need around the world.

This year, as a second year student, Diana served as an undergraduate student assistant instructor in the course and continued to give back as she mentored the next cohort of students in their Servant Leadership projects. The impact that her role in the course had on students is exemplified by the following excerpt, written in a final project report by a student that Diana mentored:

> *I was naïve to think about engineering as a profession for students who are good at the sciences and want to make a lot of money. I have expanded those ideas to a more professional level through the help of Diana, and the various exercises in this intro to engineering class.*
>
> *Engineering is about the dedication that the worker has to help better the world. It is about honesty, integrity, and hard work. Engineering requires a great amount of*

perseverance and leadership. In college, it is up to the individual to determine success. This has been a big change for me, but I believe that I am handling it well…I want to better the community in ways that people do not ordinarily realize – and I do not want recognition for these advancements. As a vision for my professional future, I would like to better the world as a whole, no matter what discipline of engineering I may end up being.

[First year student, Fall 2012]

This is just one example of many that show the impact on individual students, and the skills and motivation they develop to advance their service through their engineering education and profession. Further excerpts from student projects and course evaluations are presented in Appendix E. Finally, the course syllabus from Fall 2012 is included in Appendix F.

Year 2013 Goals

For 2013, we plan to continue to offer the course and discussions are underway about models to further expand enrollment beyond the current cap of 35 per semester. Following our conference presentation in June, we hope to initiate conversations and action with other institutions to help them adapt the course for their use.

We will also continue to strengthen our alignment with other college and campus-wide efforts to increase enrollment in the course and to support service-oriented efforts of student organizations. More specifically, we will work with the student organizations and various engineering competitions to cultivate a focus on service that complements their focus on disciplinary technical work and innovative design.

Criterion 6 – Carrying Out Mission of the Chair

Typical Thinking that Goes into Evaluating the Criterion

This is a follow-up of Criterion 2 and is an annual consideration. Is there a broad range of deliverable areas with some reasonable quantity of people involved carrying out the mission of the chair as agreed to and accepted by the institution?

Year 2012 Progress

This year, we continued to expand our work beyond the College of Engineering and are solidifying our impact and influence at a campus level. The major points of involvement include:

1. **Campus Servant-Leadership Working Group.** Drs. Harrington and Carlson-Dakes are members of this group that comes together monthly to read articles, discuss relevant topics, and host/sponsor campus-wide activities related to Servant-Leadership.

2. **Campus Coordinated Leadership Initiative.** Dr. Carlson-Dakes was selected by the Dean of Students to be the College of Engineering representative on the campus-wide Coordinated Leadership Initiative planning team. This initiative is aimed at developing a comprehensive vision, framework, and competencies for leadership education and training for UW-Madison. He has contributed to this team with a lens of the Servant-Leadership and Social Change Models of leadership development. A letter from the Dean of Students to the Dean of Engineering regarding this initiative is included in Appendix G.

3. **Chancellor's Scholars Program.** Drs. Harrington and Carlson-Dakes both serve as Chancellor's Scholar mentors designed to increase educational opportunities for academically talented underrepresented minority students. More information on this program may be found at http://www.provost.wisc.edu/csp.htm.

4. **Campus Leadership Certificate Reviewer.** Dr. Carlson-Dakes is a reviewer and mentor for the student portfolios submitted as part of the campus Leadership Certificate (http://cfli.wisc.edu/leadership_certificate.htm). Part of his work in this area will be to bring to the forefront the importance of service-oriented leadership through the work the students do in creating their portfolios.

5. **College of Engineering Student Leadership Center.** Further alignment and collaboration with activities sponsored by the College of Engineering Student Leadership Center (SLC, http://slc.engr.wisc.edu/). Assignments for the freshman leadership course include attendance at the career fair, student organization fair, and invitations to the various workshops and guest speakers sponsored by the SLC. We have also worked with the SLC to align first year students with upper level undergraduates participating in a co-op or internship. A full listing of the SLC activities and participation levels is provided in Appendix H.

Year 2013 Goals

There is a surge of campus activity surrounding leadership development that we expect to take hold in 2013. At a campus level, our Chancellor, Vice Provost for Diversity and Climate, and Dean of Students have made leadership development a top campus priority and we are at the table as these top level campus initiatives take shape. At a college level, we recently named a new Dean, Ian Robertson, who will begin in March 2013. In the press release announcing his selection, he expressed his commitment to future leadership development when he said, "Engineers are going to make a difference in the world. I'd like our students and faculty to take the leadership role in solving those problems in their classrooms and in their research."

In 2013, we will ensure that the work supported by the Pieper Foundation remains part of the conversation at a campus level and is on Dean Robertson's radar as he orients himself in his new role. Given the leadership changes, the specifics of how this will develop are uncertain, but we are committed to maintaining a campus-wide involvement to continue to bring the principles and actions of Servant-Leadership into reality across campus.

Criterion 7 – Servant Leader that Leads at an Element or Segment of our World

Typical Thinking that Goes into Evaluating the Criterion

Is there evidence that a professor in their nurturing locally, community, nation and world is consistently contributing or leading service model versus the power model? Are there multiple students participating in that level? Such a critical mass would be considered promising and obviously if such a leader or professor nurtures someone else who moves into that level, you could expect the maximum award. Examples are Nelson Mandela, Mother Teresa, and Mahatma Gandhi.

Year 2012 Progress

As noted in our Year 2011 report, we cannot point to an individual leader who is the caliber of Gandhi, Mandela, or Mother Teresa. However, we do note that there is a pervasive desire among our student body to serve the world in positive ways that follow the vision set forth by such leaders. As an example, our university "consistently places on the Peace Corps' annual list of schools that produce the most alumni volunteers" (http://peacecorps.wisc.edu/). Since the creation of the Peace Corps in 1961, 3000 UW-Madison alumni have served in the Peace Corps and this is second only to the University of California – Berkeley. In some ways, this desire for positive community service is ensured by UW-Madison's holistic admissions process, in which admissions counselors look for "sustained involvement in activities in or out of school, leadership, community involvements" and other items in addition to standardized test scores and high school grade-point averages (http://www.admissions.wisc.edu/appTipSheet.php). For this year's incoming freshman class, 58 percent were involved in school or community service during high school (http://www.news.wisc.edu/21137). In the 2010-11 academic year, 73 percent of UW-Madison seniors reported participating in community service or volunteer work while attending UW-Madison (http://apir.wisc.edu/studentsurveys/NSSE_2011_Final_report.pdf).

Within the UW-Madison College of Engineering, active service-oriented student organizations include Engineers Without Borders (http://ewbuw.org/) and Engineering World Health (http://ewh.slc.engr.wisc.edu/index.html). Even the more traditional discipline-related organizations and honor societies are involved in community-level service activities (http://slc.engr.wisc.edu/organizations.html). Examples of service projects may be found by clicking on the links of some student organizations.

In Year 2012, the student chapter of Engineers Without Borders felt the need to create a Board of Advisors to help connect the students to the professional engineering and construction community of Wisconsin. The primary need for the connection was to help the students recruit funds for overseas travel and time from professional mentors who could travel to developing nations for guidance during project construction. Recent projects have been in Rwanda, Kenya, Haiti, and El Salvador. The students invited Professor Harrington to serve on this board along with the presidents of several local engineering and construction firms. The inaugural meeting of the board took place in November 2012.

Year 2013 Goals

We hope to use the Servant Leader Chair endowment to continue encouraging engineering students to participate in activities that serve underprivileged communities both locally and in developing countries.

Appendix A.1 – Curriculum Vitae for Professor Greg Harrington

EDUCATION

PhD	Environmental Engineering	Univ. North Carolina Chapel Hill	1997
MS	Environmental Engineering	Univ. North Carolina Chapel Hill	1987
BS	Chemical Engineering	Stanford Univ.	1984

ACADEMIC EXPERIENCE

Univ. Wisconsin – Madison	Professor	Assoc. Chair	2010-	full time
Univ. Wisconsin – Madison	Assoc. Professor	Assoc. Chair	2007-2010	full time
Univ. Wisconsin – Madison	Assoc. Professor		2003-2007	full time
Univ. Wisconsin – Madison	Asst. Professor		1997-2003	full time
Univ. Wisconsin – Madison	Instructor		1996-1997	full time
Univ. North Carolina Chapel Hill	Research Asst.		1991-1996	part time
Univ. North Carolina Chapel Hill	Research Asst.		1985-1987	part time

NON-ACADEMIC EXPERIENCE

G. Harrington Consulting	Owner	drinking water consulting	1996-	part time
Clean Wellwater Technologies	Partner	well cap design	2004-2012	part time
Malcolm Pirnie, Inc	Proj. Engr.	drinking water consulting	1991-1996	part time
Malcolm Pirnie, Inc	Proj. Engr.	drinking water consulting	1989-1991	full time
Malcolm Pirnie, Inc	Engineer	drinking water consulting	1987-1989	full time

CURRENT MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS

- American Water Works Association
- Wisconsin Water Association

HONORS & AWARDS

2011 Stewards of Safe Water Award, Wisconsin Water Association
2007 Research Award, Wisconsin Water Association.
2007 Outstanding Instructor Award, Polygon Engineering Student Council, College of Engineering, University of Wisconsin – Madison.
2007 Vilas Associates Award, Graduate School, University of Wisconsin – Madison.
2004 Publications Award, American Water Works Association (AWWA).
2004 Best Paper Award, Engineering & Construction Division of AWWA.
1999 Faculty Early Career Development Award, National Science Foundation.
1998 Publications Award, American Water Works Association.
1998 Best Paper Award, Water Quality Division of AWWA.
1994 Abel Wolman Fellowship, American Water Works Association.
1994 Graduate Student Award in Environmental Chemistry, American Chemical Society.

GREGORY W. HARRINGTON (CONTINUED)

SELECTED SERVICE ACTIVITIES

UW-Madison, Department of Civil and Environmental Engineering

- Associate Chair for Undergraduate Program, 2007-present.
- Operations Committee, 2006-present.
- Coordinator, Undergraduate Option in Environmental Engineering, 1997-present.

UW-Madison, College of Engineering

- Pieper Foundation Servant-Leader Chair, 2012-present.
- Curriculum Assessment Team, 2008-present.
- Academic Planning, Curriculum, and Regulations Committee (APCRC), 2005-present.
- Advisor, Domestic Projects Group, Engineers Without Borders, 2008-present.

Other Professional Service

- Water Utility Board, City of Madison Water Utility - Madison, Wisconsin; President (2009-2011), Vice President (2002-2003, 2007-2009), Secretary (2001-2002, 2003-2007)
- Board of Advisors, Environmental Engineering Program, Department of Geography and Environmental Engineering, United States Military Academy, West Point, NY (2012-2015)

MOST IMPORTANT PUBLICATIONS AND PRESENTATIONS FROM THE LAST FIVE YEARS

- Harrington GW and T Heikkinen. 2012. "Establishing an Effective Water Utility Board." Proceedings, 2012 Utility Management Conference, AWWA/WEF, Miami, FL.
- Harrington GW, T Heikkinen, and AB Orlik. 2011. "Establishing an Effective Water Utility Board." Proceedings, 2011 Annual Conference and Exposition, AWWA, Washington, DC.
- Noguera DR, LS Yilmaz, GW Harrington, and RK Goel. 2009. *Identification of Heterotrophic Bacteria that Colonize Chloraminated Drinking Water Distribution Systems.* Water Research Foundation: Denver, CO. 98 pages. ISBN 978-1-60573-032-5.
- Fleming KK, GW Harrington, and DR Noguera. 2008. "Using Nitrification Potential Curves to Evaluate Full-Scale Drinking Water Distribution Systems." *Jour. AWWA*. 100:10:92-103.
- Srinivasan S, GW Harrington, I Xagoraraki, and R Goel. 2008. "Factors Affecting Bulk to Total Bacteria Ratio in Drinking Water Distribution Systems." *Water Research*. 42:13:3393-3404.

MOST RECENT PROFESSIONAL DEVELOPMENT ACTIVITIES

- Presentations at 2012 AWWA Water Quality Technology Conference, 2012 USEPA-ASDWA Conference for Small Water Systems, 2012 AWWA-WEF Utility Management Conference, regional conferences in Boston and Lansing.
- Presentations and discussion at continuing education short courses on practical applications of water chemistry in drinking water treatment, fundamentals of water treatment processes, and water quality issues in drinking water distribution systems.

Appendix A.2 – Curriculum Vitae for Dr. Christopher Carlson-Dakes

Professional Summary

For 15+ years, I have dedicated my career to leading campus efforts that enrich our teaching, learning, and research culture for diverse faculty, students and experienced professionals from all disciplines. The impact of my work can be seen locally, nationally, and internationally through individual transformations, programmatic successes and organizational structures that persist and continue to evolve, and published research used by others. My leadership and research experiences in program creation and assessment, faculty development, classroom teaching, and executive level professional development in industry provide me with a unique array of knowledge and skills that connect with individuals and local contexts while leading comprehensive, large scale organizational development initiatives.

Education

Ph.D., Industrial and Systems Engineering, Human Factors and Socio-Technical Systems
University of Wisconsin-Madison, Madison, WI

M.S., Mechanical Engineering: Dynamic Systems
The Pennsylvania State University, University Park, PA

B.S., Mechanical Engineering: Mechanical Design Division
Carnegie-Mellon University, Pittsburgh, PA

Professional Experience – Brief Overview

Since 1995, I have held continuous and progressively advancing joint appointments at UW-Madison. I am also currently affiliated with Edgewood College, Madison Media Institute, and TomoTherapy's Institute of Learning. Each position is briefly listed below with further details on the following page.

2008-present	**Faculty Associate, Engineering Leadership Programs and Courses** *UW-Madison, Engineering Professional Development*
2009-present	**Adjunct Faculty, School of Business, Management Division** *Edgewood College, Madison, WI*
2010-present	**Organizational Development and Management Consultant** *TomoTherapy/Accuray Institute of Learning, Madison, WI*
2010-present	**Faculty, College of Media Arts, Management, and Business** *Madison Media Institute, Madison, WI*
2002-2009	**Director of Organizational Development** *Affiliated Engineers, Inc., Madison, WI*
2003-2008	**Associate Director, Delta Program in Research, Teaching, and Learning** *UW-Madison, The Wisconsin Center for Education Research*
1999-2003	**Faculty Associate** *UW-Madison, College of Engineering*
1995-2003	**Associate Director, Creating a Collaborative Academic Environment (CCAE)** *UW-Madison, Office of the Provost, Wisconsin Center for Education Research*

Professional Experience – Details

Faculty Associate, Creator and Lead Instructor: Engineering Leadership Programs ***2008-present***
Engineering Professional Development, University of Wisconsin-Madison
Create, teach, and evaluate graduate and undergraduate level course and programs designed to prepare future engineering leaders with a holistic and global skill set beyond their technical curriculum. The courses and programs emphasize emotional intelligence, diversity, and globalization through teamwork and self-reflection.

Adjunct Faculty, School of Business, Management Division ***2009-present***
Edgewood College, Madison, WI
Faculty of record for courses in Management division of the MBA Program, and the Returning Adult Accelerated Program. Courses include Organizational Behavior, Leadership and Management, Human Resources Management, and Change Management.

Organizational Development and Management Consultant ***2010-present***
TomoTherapy/Accuray, Madison, WI
Contracted to design, create, facilitate, and implement a broad range of leadership, management, and organizational change training programs. Programs are offered for employees across entire organization as well as partner companies as part of a consortium. Topics include basic strategic planning and goal setting, communication skills, performance management, leading organizational change initiatives, and time and stress management.

Faculty, College of Media Arts, Management, and Business ***2010-present***
Madison Media Institute, Madison, WI
Faculty of record to develop, teach, and evolve Organizational Psychology and Business Ethics courses as part of the Entertainment and Media Business Bachelor's program. Also responsible for teaching and advising students in career development.

Director of Organizational Development ***2002-2009***
Affiliated Engineers, Inc., Madison, WI
Executive leadership position that engaged Shareholders as peers to develop company strategic goals, created and directed office-wide professional development initiatives for 200+ employees, and connected goals to market trends and individual career aspirations.

Associate Director, Delta Program in Research, Teaching, and Learning ***2003-2008***
The Wisconsin Center for Education Research, University of Wisconsin-Madison
Co-led program development and implementation for broad range of professional development opportunities in the Delta program (UW implementation of the NSF sponsored faculty development Center for the Integration of Research, Teaching, and Learning).

Faculty Associate, Engineering Professional Development ***1999-2003***
College of Engineering, University of Wisconsin-Madison
Worked collaboratively with eight faculty and 20 teaching assistants in a freshman service learning design course where students research, design, build, and deliver a project to a local customer.

Associate Director, Creating a Collaborative Academic Environment (CCAE) ***1995-2003***
Office of the Provost, Wisconsin Center for Education Research, University of Wisconsin-Madison
Worked in partnership with the Director to create, implement, evaluate, and disseminate results of applied research program centered on inclusive and collaborative faculty development.

Appendix B – Senior Exit Survey Data for Questions Relevant to Leadership Education

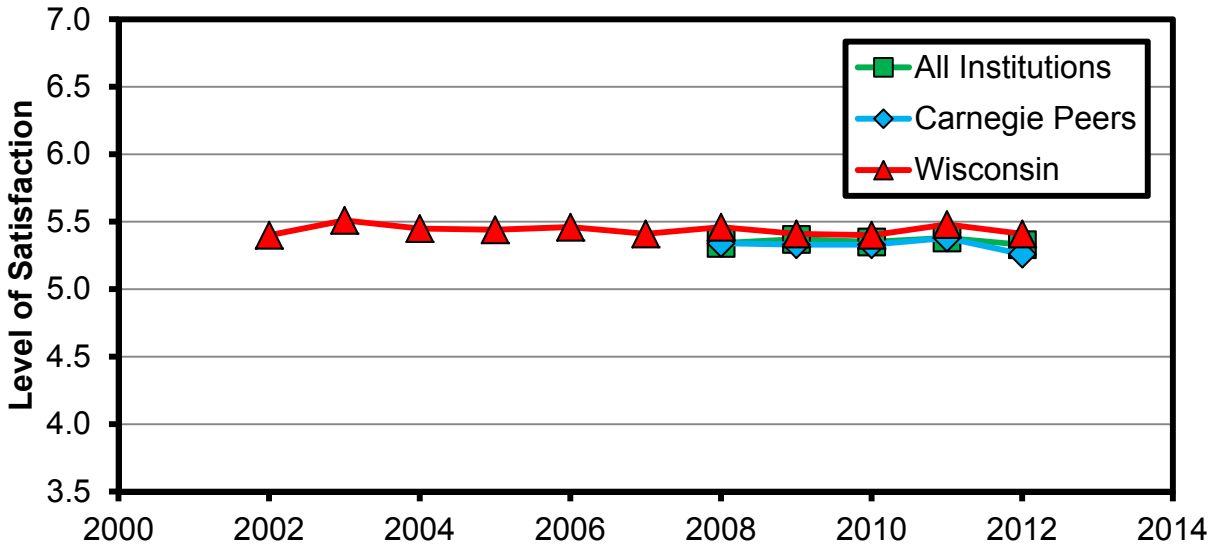

Figure B1. Mean level of satisfaction with value derived from team experiences. The x-axis is organized on an academic year basis, so that 2012 refers to the 2011-12 academic year. The Pieper Servant-Leader Chair at the UW-Madison College of Engineering began in the 2008-09 academic year. The scale on the y-axis has a minimum value of 1 (very dissatisfied) and a maximum value of 7 (very satisfied). The difference between Wisconsin and peer institutions is statistically significant at a 95% confidence level.

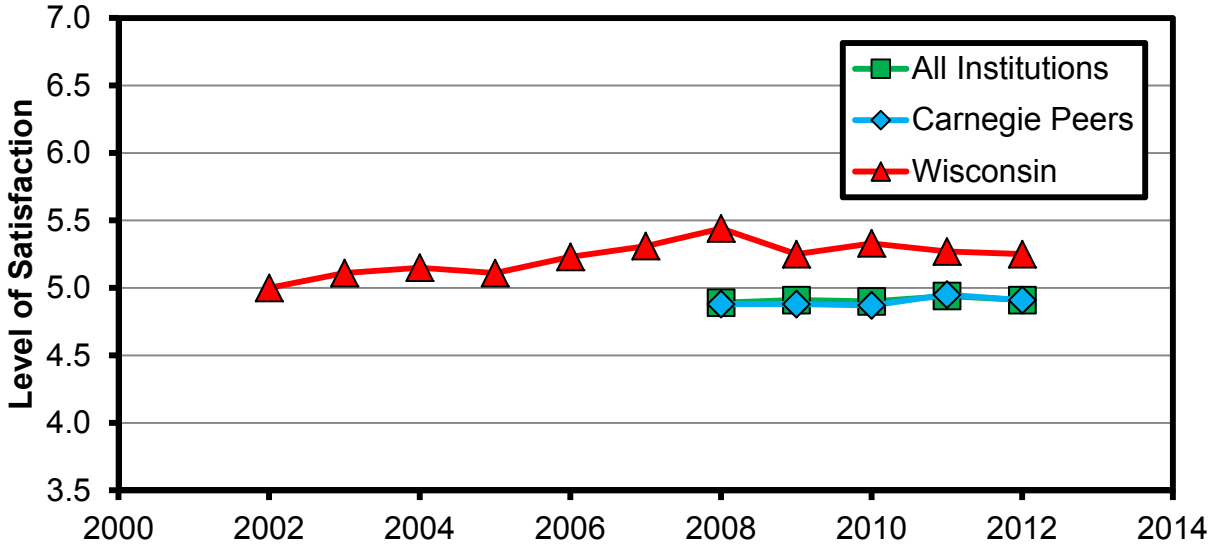

Figure B2. Mean level of satisfaction with value of engineering student organization activities. The x-axis is organized on an academic year basis, so that 2012 refers to the 2011-12 academic year. The Pieper Servant-Leader Chair at the UW-Madison College of Engineering began in the 2008-09 academic year. The scale on the y-axis has a minimum value of 1 (very dissatisfied) and a maximum value of 7 (very satisfied). The difference between Wisconsin and peer institutions is statistically significant at a 95% confidence level.

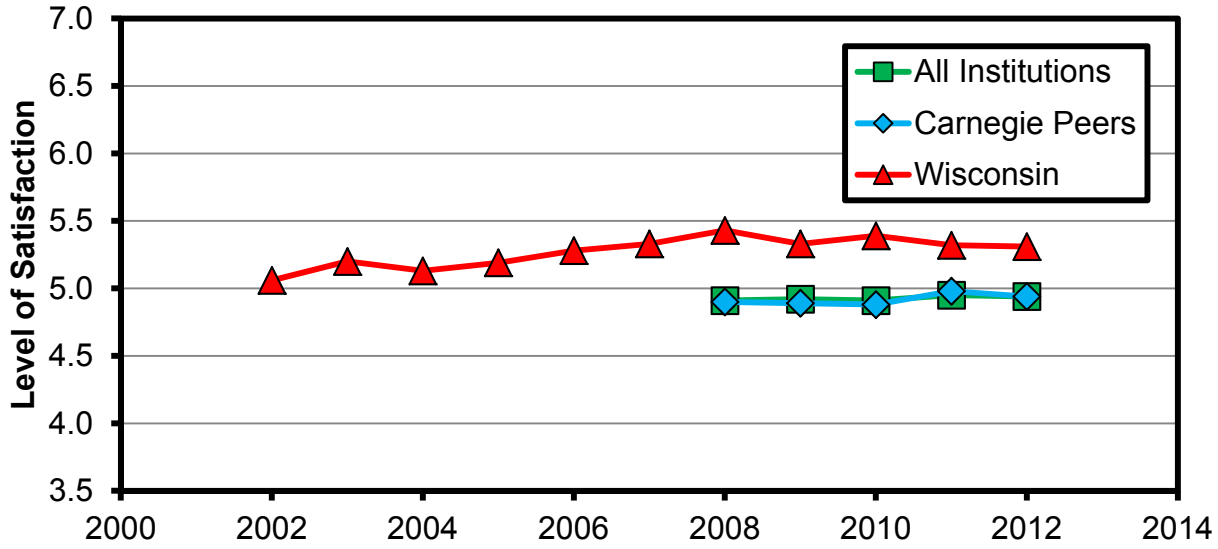

Figure B3. Mean level of satisfaction with leadership opportunities in engineering student organization activities. The x-axis is organized on an academic year basis, so that 2012 refers to the 2011-12 academic year. The Pieper Servant-Leader Chair at the UW-Madison College of Engineering began in the 2008-09 academic year. The scale on the y-axis has a minimum value of 1 (very dissatisfied) and a maximum value of 7 (very satisfied). The difference between Wisconsin and peer institutions is statistically significant at a 95% confidence level.

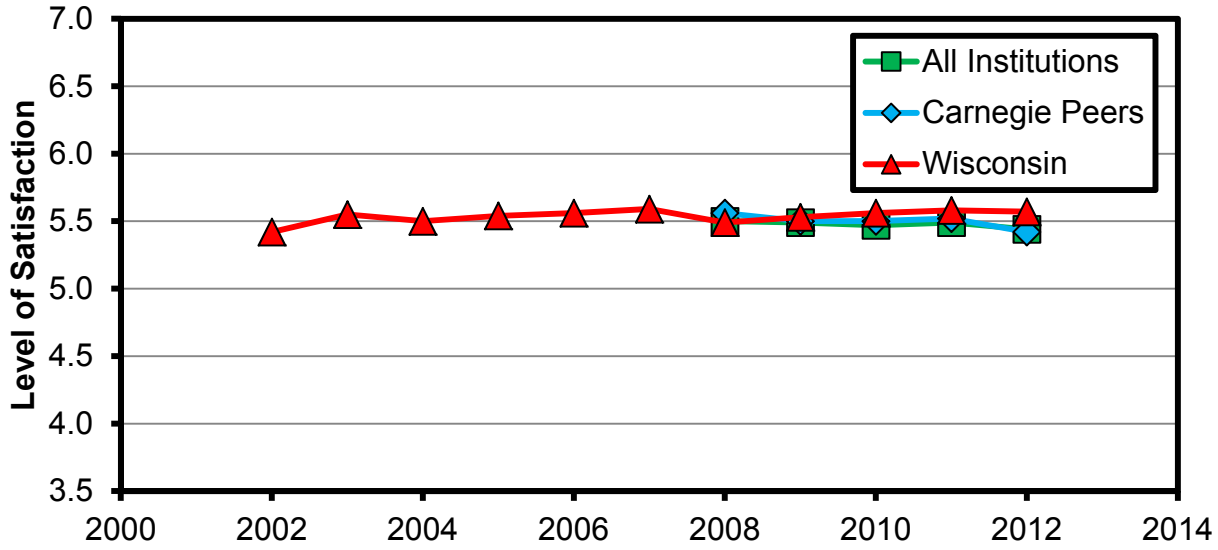

Figure B4. Mean level of satisfaction with fellow students' ability to work in teams. The x-axis is organized on an academic year basis, so that 2012 refers to the 2011-12 academic year. The Pieper Servant-Leader Chair at the UW-Madison College of Engineering began in the 2008-09 academic year. The scale on the y-axis has a minimum value of 1 (very dissatisfied) and a maximum value of 7 (very satisfied). The difference between Wisconsin and peer institutions is not statistically significant at a 95% confidence level.

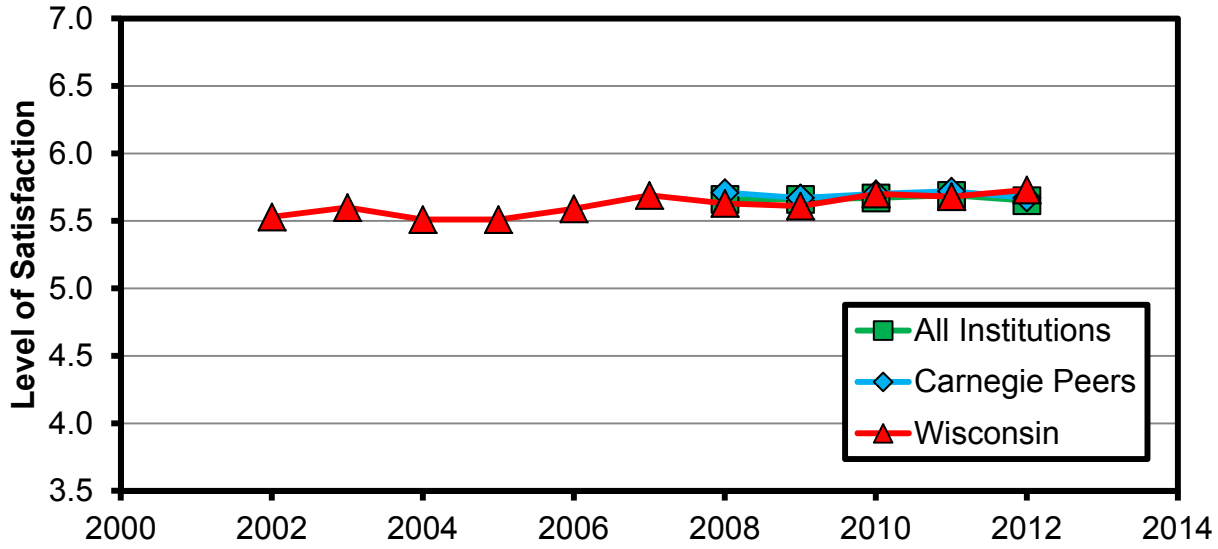

Figure B5. Mean level of satisfaction with fellow students' level of camaraderie. The x-axis is organized on an academic year basis, so that 2012 refers to the 2011-12 academic year. The Pieper Servant-Leader Chair at the UW-Madison College of Engineering began in the 2008-09 academic year. The scale on the y-axis has a minimum value of 1 (very dissatisfied) and a maximum value of 7 (very satisfied). The difference between Wisconsin and peer institutions is not statistically significant at a 95% confidence level.

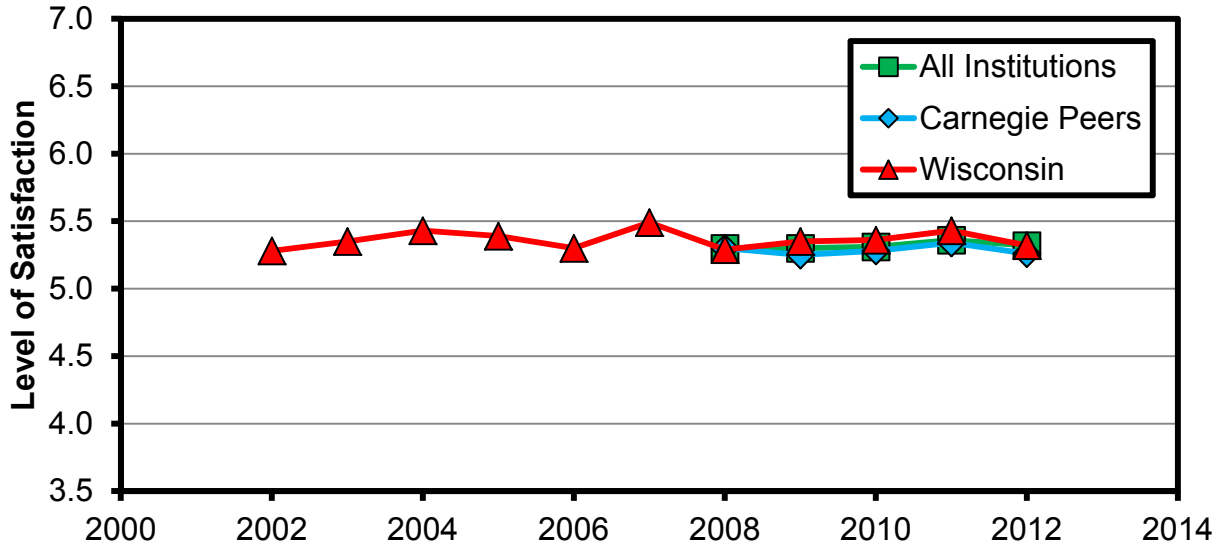

Figure B6. Mean level of satisfaction with how engineering education enhanced ability to function on multidisciplinary teams. The x-axis is organized on an academic year basis, so that 2012 refers to the 2011-12 academic year. The Pieper Servant-Leader Chair at the UW-Madison College of Engineering began in the 2008-09 academic year. The scale on the y-axis has a minimum value of 1 (very dissatisfied) and a maximum value of 7 (very satisfied). The difference between Wisconsin and Carnegie peer institutions is statistically significant at a 95% confidence level. The difference between Wisconsin and all institutions is not statistically significant at a 95% confidence level.

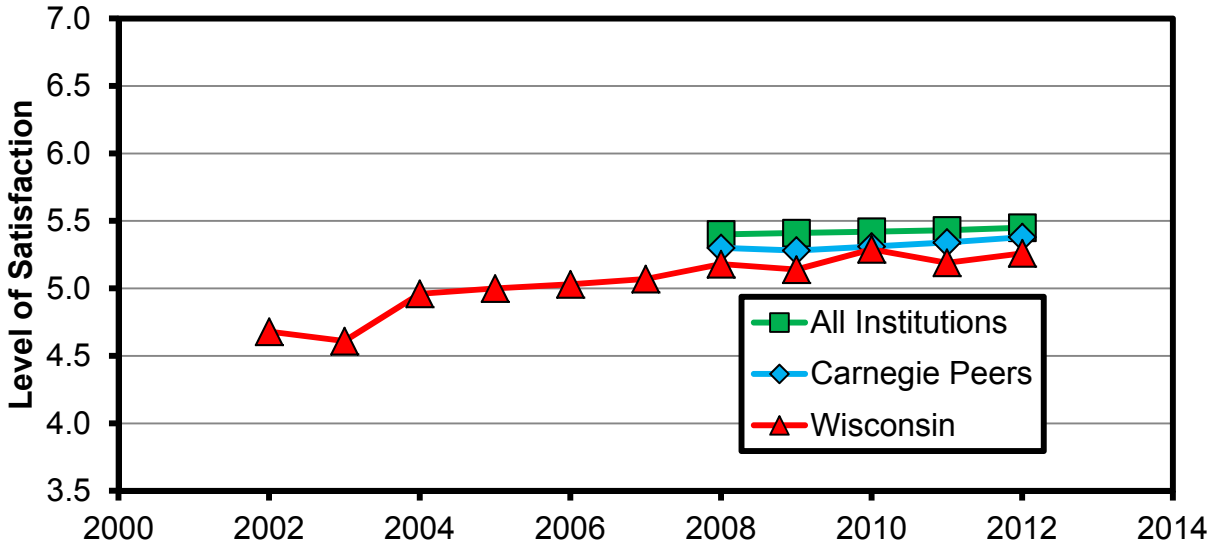

Figure B7. Mean level of satisfaction with how engineering education enhanced ability to understand ethical responsibilities. The x-axis is organized on an academic year basis, so that 2012 refers to the 2011-12 academic year. The Pieper Servant-Leader Chair at the UW-Madison College of Engineering began in the 2008-09 academic year. The scale on the y-axis has a minimum value of 1 (very dissatisfied) and a maximum value of 7 (very satisfied). The difference between Wisconsin and peer institutions is statistically significant at a 95% confidence level.

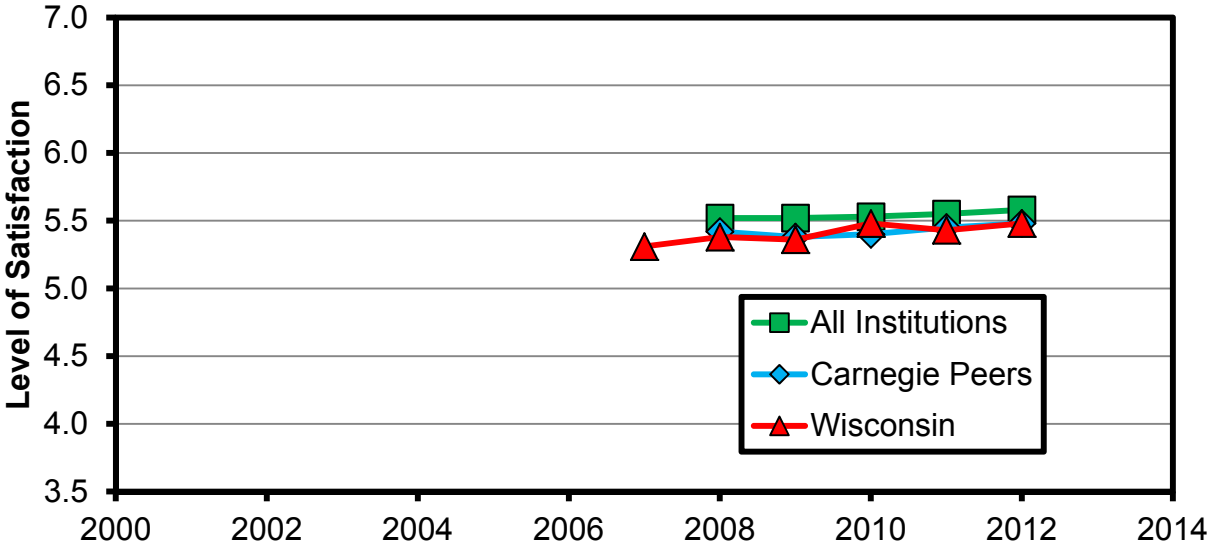

Figure B8. Mean level of satisfaction with how engineering education enhanced ability to understand professional responsibilities. The x-axis is organized on an academic year basis, so that 2012 refers to the 2011-12 academic year. The Pieper Servant-Leader Chair at the UW-Madison College of Engineering began in the 2008-09 academic year. The scale on the y-axis has a minimum value of 1 (very dissatisfied) and a maximum value of 7 (very satisfied). The difference between Wisconsin and Carnegie peer institutions is not statistically significant at a 95% confidence level. The difference between Wisconsin and all institutions is statistically significant at a 95% confidence level.

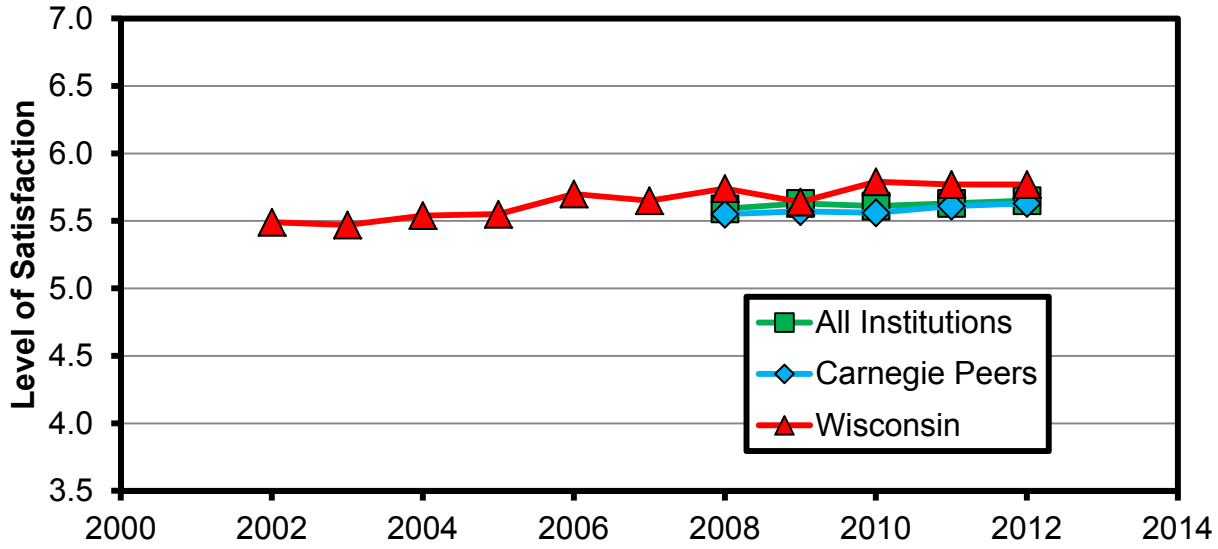

Figure B9. Mean level of satisfaction with how engineering education enhanced ability to recognize need to engage in lifelong learning. The x-axis is organized on an academic year basis, so that 2012 refers to the 2011-12 academic year. The Pieper Servant-Leader Chair at the UW-Madison College of Engineering began in the 2008-09 academic year. The scale on the y-axis has a minimum value of 1 (very dissatisfied) and a maximum value of 7 (very satisfied). The difference between Wisconsin and peer institutions is statistically significant at a 95% confidence level.

Appendix C – Abstract and Draft of Manuscript Submitted to ASEE

Leadership development in tight times: Expanding our educational reach without watering it down

Christopher G. Carlson-Dakes, PhD[1] and Gregory W. Harrington, PhD[2]

Abstract

This paper addresses a challenge many universities face: How can we meet increasing demands for undergraduate leadership development during a time of dwindling resources? Our alumni and industry partners tell us we need to graduate students with more leadership experience – yet we encounter a confluence of conflicting factors that make it difficult to respond accordingly. Leadership development is a long-term process in which students benefit from early and ongoing engagement throughout college. Recommendations by the National Academy of Engineering reinforce educational research that shows learning is enhanced by smaller classes, more direct contact with instructors, and active engagement in real world projects. Yet we struggle to find feasible paths to take action. Pressures to increase enrollment and cut budgets challenge us to find ways to do more with less without diluting the learning experience. Administrators embrace the need to update curriculum to remain current and relevant, yet there is no room to add in a tightly packed four-year program. These tensions require innovative approaches to engineering education and leadership development to meet the challenges of the future.

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Leadership development in tight times: Expanding our educational reach without watering it down

Introduction – An Overall Framework

There is general agreement that a renewed focus on leadership development is critical to the future success of the engineering discipline (NAE 2004). Our thinking begins to diverge, however, when we discuss *why* we face this need, *who* needs to act, *what* needs to be done, and *how* we can begin to take action.

This paper offers one curricular model as a point of intervention that has shown early success in preparing leaders at a large public research university while remaining mindful of our national trend toward increasing enrollments and decreasing budgets. The paper ends with lessons learned and guidelines for how to expand and adapt this model at other institutions.

There are numerous pockets of activity and local champions of leadership development efforts on many campuses. Overall, however, our collective efforts have been inadequate to respond accordingly with regard to how we cultivate, identify, and intentionally develop engineering leaders of the future. As engineering faculty, the challenge in front of us to develop future engineering leaders is one that industry partners and potential students are expecting us to meet. Yet this challenge comes at a time of dwindling budgets, higher enrollments, and more rigorous research expectations. Many of us feel as if our hands are tied – we know the need, and feel the urgency, yet realize we are ill-prepared to act. To see action, we need individual commitment, surrounded by institutional support, toward a global need. This leaves us with a central question: How do we do more with less?

In The Courage to Teach, Parker Palmer explores an approach to educational transformation by engaging in deep inquiry of fundamental questions of *what, how, why,* and *who* (Palmer 1998). We often start out with content and curriculum – the *what* that is being taught. If we dig a bit deeper, we begin to consider pedagogical structures – the *how* we are teaching the *what*. Occasionally, we may ask *why* we are teaching *what* we teach. Rarely, however, do we get to the point of reflecting and sharing the personal values present in our teaching and learning endeavor – the root questions of *who* are we as teachers, and equally important, *who* are our students as learners? These three elements – curricular content (what), pedagogical structure (how), and personal values (why and who) – serve as the basis for a model for this paper that can help frame our actions toward more intentional leadership development for undergraduate students.

A Changing Landscape – A Case for Why We Need to Act

Globalization, generational shifts in the workplace, more flexible organizational structures, and increasingly complex problems require us to rethink how we cultivate, identify, and sustain leaders of the future (NAE 2004). Societal needs for sustainable energy sources, upgrades to our decaying infrastructure, access to clean water, and affordable health care are just a few of

the many global challenges engineering leaders will be called upon to resolve throughout their careers with a stronger sense of urgency than we currently face. The technologies already exist to address many of these needs. What we lack, however, are leaders at all levels who are able to integrate their technical expertise into non-technical arenas to work cross-disciplinarily, cross-functionally, and cross-culturally, to bring technological ideas to life in a relevant context and on a broader scale.

The NAE committee who authored the "Engineer of 2020" (NAE 2004) referred to this need when they defined several "Aspirations for the Engineer of 2020" including a call for us to aspire to a future of engineering that includes professionals who, "assume leadership positions…in the making of public policy and in the administration of government and industry", and to, "effectively recruit, nurture, and welcome underrepresented groups to its ranks". The guiding principles of the NAE report also include keeping, "pace with technological innovations", and expanding our capacity to appropriately contribute to an, "increasingly diverse and multidisciplinary" global community. More recently, in February 2012, the President's Council of Advisors on Science and Technology published a report that included three imperatives: 1) Improve the first two years of STEM education in college, 2) Provide all students with the tools to excel, and 3) Diversify pathways to STEM degrees (President's Council 2012).

Without a doubt, these are challenging goals under any circumstances. Our current divisive political climate and uncertain economic outlook make this an even more daunting task. To help frame a course of action at an institutional level, we must address a fundamental question: Amidst continually decreasing budgets for public higher education, how can we respond to a growing need to educate future engineering leaders by:

1. **increasing *and* diversifying** our enrollments,
2. **expanding our curriculum** beyond familiar terrain of technical expertise to engage cross-disciplinary synergies we don't yet fully understand,
3. **shifting our pedagogical framework** to be more effective, current, and relevant to a more diverse student body, and
4. **maintaining the rigor and quality** of world class educational experiences for all students?

There is no magic bullet solution that meets these four challenges. No single event, institution, or individual led us to these challenges, and no single solution is going to resolve them. Rather, there are multiple avenues to explore and many points of intervention that can collectively make a difference. To borrow from a baseball analogy, if we wait for the homerun hitter to clean the bases with a grand slam, we are committing three troublesome errors. First, we are relegating the responsibility to someone else. Second, we are assuming that there is a single "homerun" solution that can do it all. Finally, we are deferring action until a later time, when the time to act is now. We all can do something – today. But what and how?

To paraphrase Albert Einstein, we cannot address the problems of tomorrow with the same approaches we used to create them. It is critical to note that both the NAE and the President's Council highlight the importance of diversifying our discipline. Historically in the United States, the engineering discipline, "has been nourished principally by drawing from a white male population" (NAE 2004). Looking to the future, the opportunities to address the problems we will face, and the body of work to be done, requires us to expand our discipline to be more inclusive of, and welcoming to, a more diverse group of talented individuals. Additionally, we must begin to tip the balance toward an integrated model that strives to educate the whole person – technical and non-technical – such that our graduates are prepared to be leaders who can address the global needs of the future that differ from what was needed when many of us completed school.

As educators, we do not leave technical skills development to chance, hoping that students will pick them up along the way or learn them from someone else. But, it is fairly common for us to approach leadership skills development as if it is something that can be deferred until later in student's career, or "outsourced" to another department, school, or organization. Sometimes, we adopt the "osmosis" model and hope students pick up the requisite leadership skills simply by struggling their way through college. Solid technical skills will get students into the door of a career. From there, however, it is often their leadership skills that will limit or expand their career opportunities and success.

This paper is based on the premise that starting with ourselves as educators, we need to reconsider the way we individually and collectively think about, embrace, and intentionally develop engineering leaders of the future. For some students, our current approach is a viable model for their success. No doubt, today we have many highly successful engineering leaders in our discipline. For other students, however, in particular those who hail from underrepresented demographics, we are doing them and our discipline a disservice by presuming that they will find their way amidst a learning environment that has been documented to be ineffective, unwelcoming, and even hostile or threatening to them (Steele 2010). Thus, we leave the leadership of our disciplines in the hands of the select few for whom the traditional approach has worked. This homogenization of our discipline perpetuates our current cycle and restricts our ability as a discipline to advance toward an increasingly complex, global, and intermingled future.

An Institutional Pathway Forward

To develop a strong cohort of future engineering leaders, our institutions need to engage, support, and exhibit leadership at all levels. We need a compelling and coordinated vision from the top, supported by mid-level champions across campus and enacted by committed individuals in- and out of- the classroom. We all have a place at the table and a voice in the conversation for taking good intentions and moving them to action.

The University of Wisconsin-Madison has a long-standing institutional history and tradition of graduating strong leaders, including more Peace Corps and Teach for America volunteers than most any other university in the country, and more leaders of major corporations than any university in the country (Berquam and Brower 2010). In an attempt to better understand why, recent campus-wide efforts have focused on defining the "Wisconsin Experience" - a set of core institutional principles and practices that help cultivate a campus culture of holistic education that can provide a framework for more intentional leadership development efforts (Berquam and Brower 2010). Our decentralized campus and faculty governance structure make it difficult to embrace a single model or coordinated approach. We often find that we recreate the wheel in many pockets of campus, at times competing with each other for resources and participants. But we all have in common a desire to create learning experiences that are inclusive, rigorous, and engaging for our students to help prepare them to be leaders with a vibrant future.

The common language of the "Wisconsin Experience" provides the UW-Madison with a framework to more consistently explicate our culture, and to work cross-disciplinarily and cross-functionally toward common educational goals. A set of Essential Learning Outcomes (ELO) provides an overall picture of what students need to prepare for the 21st century challenges (AAC&U, 2007). Broadly speaking, the ELO's include:

1. Knowledge of human cultures and the physical and natural world
2. Intellectual and practical skills
3. Personal and social responsibility, and
4. Integrative learning

To meet these ELO's, a set of High Impact Practices (HIP) provide a list of opportunities for experiential learning that can be adapted for individual courses (Kuh, 2008, AAC&U, 2007). Together, these ELO's and HIP's have been instrumental in moving toward unifying our campus efforts to broaden the core of "usual suspects" involved in leadership development - all without institutional mandates that dictate the specifics of *how*. This is the type of top level institutional vision required to solidify a path forward.

Our College level first-year enrollment numbers reflect a national trend where the number of potential engineering students continues to increase (ASEE 2012). UW-Madison has seen a 42% increase from 2005-2010 (Romero 2011), and our students are entering with more robust leadership experiences and higher expectations for continued leadership development. Higher enrollments and expectations, coupled with decreasing budgets poses a pedagogical challenge to advance our teaching by continuing to connect, engage, and explore new terrain with our students. Our College of Engineering administration has supported leadership development via student organizations, small enrollment courses, internships and co-ops, and numerous workshops, seminars, guest speakers, and activities (Doll et al. 2009). In recent years the College has made strides toward a more integrative model that brings together curricular,

extra-curricular, and professional development activities to provide students with more integrated leadership development experiences.

But an institution-wide vision and college level support will remain theoretical unless and until individual faculty in the classroom make the commitment to initiate change. This is precisely where we focused our efforts when we created an experimental course, "Core Competencies for Engineering Leaders". This course addressed student and industry expectations for formalized leadership development and offered pressure relief for other high-enrollment introductory core Engineering courses that are currently over capacity. After three successful semesters, the course is poised for continuation and growth to scale up to meet the increasing demands. The remainder of the paper will focus on the creation, evolution, and future growth plans for the course, and will point to lessons learned that can assist in adaptation for other institutions.

Evolution of a Course – Design and Structure

The authors of this paper, with feet planted in academia, industry, and our community, observed a gap in our curriculum that needed to be addressed. Industry was looking to hire engineers with a set of skills and experiences we felt our undergraduates were not adequately receiving. We also perceive a growing need for our students to have global awareness and community involvement to be better able to act as stewards of the engineering discipline throughout their careers. In response to this need, we developed a course to address two main objectives intended to develop future leaders by:

1. Raising awareness, appreciation, and knowledge of leadership to help make informed and intentional choices about professional life;
2. Engaging in experiential service learning to develop and apply critical leadership skills.

In 2008, with funding from the College of Engineering's "Engineer of 2010" program to fund innovative curricular projects, we developed a Junior/Senior level leadership development course for students holding leadership positions in student organizations. Student feedback from four semesters of this course told us that they would have benefited from this course had it been offered earlier in their college career – ideally their first year.

In response to this feedback, with the support of the Pieper Foundation (srpieperfamilyfoundation.com), and under the leadership of an endowed professorship for Servant Leadership, we created and launched a pilot course in Fall 2011 for 25 incoming first year students. One course enrollment slot was open during each summer orientation session until the course filled. Quickly we had a waiting list of additional students wanting to enroll, so in Spring and Fall 2012, the enrollment cap expanded to 35. Each time the course filled to capacity. As we write this paper, we are considering feasible models to gradually expand the enrollment such that we can meet the demand while maintaining the integrity, rigor, and intimacy of a small group learning experience – a central feature of the course.

The course content is framed by the Social Change Model of Leadership Development (Astin 1996) and a commitment to Servant Leadership (Keith 2008). It is based on the premise that leadership is not simply a place of positional authority. Rather, leadership is a process that can be learned, and includes a *responsibility to act in service to others* rather than a role of *exerting control over others*. Everyone has the potential to be a leader, but it takes intentional development – a purpose this course is designed to meet.

The 15-week semester is sequenced in four themes intended to engage students in four phases of development: 1) understand historical context and landscape of leadership, 2) develop a framework for action, 3) apply skills to move from concept to action, and finally 4) reflect on what they learned to craft a plan of action for ongoing future growth and development. Their movement through these four themes is reflected in our pedagogical approach that advances course content by increasing the complexity of course assignments throughout the semester. Our method of delivery and engagement also progressively puts more responsibility and autonomy on the students as the semester progresses.

The course structure is designed to build a learning community where small group learning experiences serve as a central feature. Learning community development requires more than simply putting students together in groups and sending them on their way to do their work. The groups are designed to be as diverse as possible across multiple dimensions to enhance student learning (Page 2007). Our approach is based on the four primary principles of learning communities as defined by Brower and Dettinger (1998):

1. Shared learning and discovery,
2. Meaningful interactions,
3. Connections to out-of-class activities,
4. Inclusive learning environments.

To meet the learning community challenge of maintaining small group experiences on a large campus, we engaged a group of upper level undergraduate Student Assistants (SA's) to help teach the course. We hire enough SA's to maintain a student:instructor ratio of 7:1, an optimal group size for meaningful and inclusive exchange of diverse ideas (Zander and Cartwright 1968). The challenge of scaling up for even larger enrollments will be further addressed later in the paper.

The course also integrates ample time for individual reflection such that the performance and learning of more introverted students is not compromised. As Susan Cain writes, "we should actively seek out symbiotic introvert-extrovert relationships, in which leadership and other tasks are divided according to people's strengths and temperaments", (Cain 2012).

"Who" Are We as Teachers and Who Are Our Students?

Many faculty primarily trained as researchers face the "imposter syndrome" – the feeling that we do not know what we are doing when we step into the role as teachers (Clance 1985). Ambrose, et al. (2010) write, "Principles of learning apply to instructors as well because, when it comes to teaching, most of us are still learning. Teaching is a complex activity, and yet most of us have not received formal training in pedagogy." This sobering insight leads us to ask questions about ourselves and our students. What do our students need and what do they want (these are often times not the same)? Who are we, as teachers, and how can what we have to offer fulfill the needs and wants of the students?

As teachers, we are expected to have the answers and are not accustomed to publicly acknowledging when we are struggling through our own learning. Throughout the course development process, we often found examples when we needed to once again become learners ourselves.

As an example, we realized we needed to appropriately embrace technology and social media as a viable means of engaging with students. Our familiar approach largely relied on face-to-face in-class interactions. What role could, and should, technology play in the course to enhance learning? To what extent do we pursue hybrid or blended learning opportunities as detailed in Garrison and Vaughan (2008)? Do we move mini-lectures to online recordings to view outside of class? Do we create a course Facebook page? Tweet with our students? Hold online "office hour" chats? These, and many other options, are currently under consideration as the course continues to evolve and we continue to learn.

We also found areas where we had to set aside our personal preferences because they were out of alignment with, or not fully inclusive of, the diverse student needs. In the spirit of Robert Greenleaf's model of Servant Leadership "to serve first" before aspiring to lead (Greenleaf 1977) we needed to step back and understand how this course could serve our students. Our work with the Center for the First Year Experience (newstudent.wisc.edu) strengthened the course by solidifying the way we integrated course content with the process of their first year transition to college (Ward-Roof 2010). The course was brought to life as we grounded it in the student experience, informed by real world applications, and framed by academic theories and models. The course requires a lead instructor with experience in industry and the classroom, and the ability to connect with students without appearing to be too far removed from the realities of their lives. Where there were gaps in real world experience, we filled them with campus, community, and industry guest speakers, always mindful of avoiding the pedagogical model of disconnected "talking heads" popping in and out to cover a variety of topics. Where we found disconnects from the student experience, we relied on the SA's and students to bring their wealth of relevant, creative, thoughtful, and engaging student experiences into class to learn from each other.

At times it was not easy or comfortable turning over control of the course to learn from the students and SA's. Stepping out of our roles as teachers to once again assume that of a learner

runs counter to the traditional faculty culture, yet may be exactly what we need to do to connect with our students. In David Damrosch's book about reconceptualizing the university, he writes, "If genuine academic reform is to occur, this community needs to be more fully understood and then creatively reconceived" (Damrosch 1995). With this in mind, we now turn to the question, *how can we creatively reconceive our approaches to teaching?*

"What" Are We Teaching, and "How" Are We Teaching It?

One approach to the question of "how" that resonates with engineers is the concept of backwards design (Wiggins and McTighe, 2006) a design approach adapted for curricular reform. Backwards design starts with the end goals in mind and works "backwards" toward the pedagogical practices and content needed to reach these goals. As an institution, the UW-Madison is committed to the broad set of Essential Learning Outcomes (ELO) as the starting point, and to a to a set of High Impact Practices (HIP) that provide an array of engaging and actionable options to align learning activities with course goals. Sandwiched in the middle are assignments and forms of assessment that serve as mechanisms to help students demonstrate their learning gains (Figure 1).

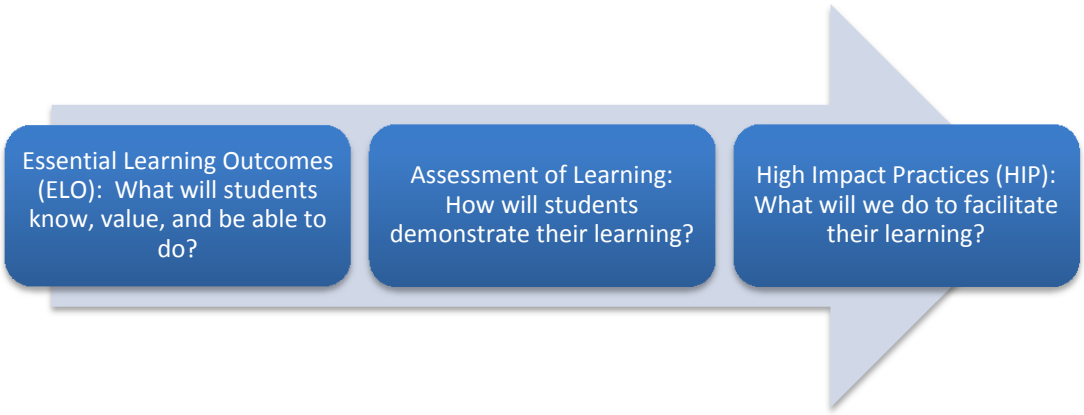

Fig. 1. Essential Learning Outcomes (ELO) and High Impact Practices (HIP)

Applying these steps to the leadership course, we started with the four overall objectives of engineering education listed in the introduction: 1) increase diversity, 2) expand our curriculum, 3) shift our pedagogical framework, and 4) maintain the rigor and quality of education. Specific course objectives are for students to reflect on, and demonstrate knowledge of:

1. A personal vision for their professional future and the spectrum of career opportunities available,
2. How their strengths, leadership potential, and development needs can help them achieve their personal vision,
3. The leadership roles that engineering professionals can play in service to a breadth of technical, social, political, environmental, economic, and global issues,
4. How to access resources to assist ongoing leadership development beyond this course.

We also developed a set of experiential course objectives for students to be able to:

5. Comfortably and professionally communicate directly with peers, practicing engineers and adult professionals,
6. Apply and reflect on the "Seven C's" of the Social Change Model (Astin 1996) through engaging as Servant-Leaders (Keith 2008) in a stewardship service project,
7. Apply teamwork and leadership skills necessary to embrace individual differences and help groups collaborate on shared aims and values,
8. Use new skills, tools, and insights to advance ideas from concepts to action,
9. Craft an action plan for future leadership development.

Students enter college at different levels of ability for each of these objectives, but they all begin with a basis. Rather than further stratifying students into predetermined tracks based on their entry point, we wanted to engage all students and help them advance their learning, regardless of where they started. Bloom's Taxonomy (Bloom et al. 1956) widely used over the years to define levels of the cognitive domain of learning, provided a basis to consider how to engage students at all levels of development. Since its original inception, Bloom's model has been critiqued as being too sequential and simplistic, and exclusive because it was develop by and from the experiences of colleges-aged male students (Hogsett 1992). Hogsett's critique is valid, and provides a more comprehensive insight into the subtleties and complexities of our cognitive development. Yet there are parts of Bloom's original model that remain useful. Statistician George Box's famous saying that, "All models are wrong, but some are useful" is particularly salient here. With Hogsett's critique, Box's invitation to take what is useful, and Anderson and Krathwohl's work that further refined Bloom's work with nineteen specific cognitive processes (Anderson et al. 2001) we have a useful framework to determine learning objectives and learning activities for the course. Table 1 illustrates how the refined model of Bloom's Taxonomy was coupled with the primary assignment types to addressed the various levels of learning.

Reflective writing, a useful professional skill to develop (Brookfield 1995; Schön 1983) is used as a primary mechanism to help students meet the course objectives. The course incorporates a combination of in-class real-time brief reflective writings, weekly unrefined homework submissions, and deeper, more comprehensive writing assignments to help students process, synthesize, and analyze their learning.

An example of how the generic table above can be applied to each of the specific course objectives is shown in Table 2 for Objective #7, "Apply teamwork and leadership skills necessary to embrace individual differences and help groups collaborate on shared aims and values". This completed table illustrates how each assignment type addresses some (but not all) levels of Bloom's taxonomy, and how collectively all assignments fulfill all levels.

Assignment Type	Modified Bloom's Taxonomy *(Anderson, Krathwohl, and Bloom, 2001)*					
	Remember	Understand	Apply	Analyze	Evaluate	Create
Reflections and written homework	Recognize Recall	Interpret Summarize Compare Explain		Differentiate Organize	Check Critique	
Course project			Execute Implement			Plan Generate Produce
Out-of-class activities			Execute Implement			Plan
In-class attendance & participation		Interpret Exemplify Summarize	Execute Implement	Differentiate Attribute	Checking Critique	Generate

Table 1. Modified Bloom's Taxonomy Aligned with Assignment Type

Assignment Type	Modified Bloom's Taxonomy *(Anderson and Krathwohl, 2001)* *[Applied to Learning Objective#7: Developing Teamwork Skills]*					
	Remember	Understand	Apply	Analyze	Evaluate	Create
Reflections and written homework	Weekly informal reflections, and periodic formal written homework assignments about group process			Weekly informal reflections, and periodic formal written homework assignments about group process		
Course project			Project team formation & execution to implement out-of-class project			Project team formation & project creation
Out-of-class activities						
In-class attendance & participation		In-class discussions to understand connections between, and application of, course content to project creation and implementation. Analysis and evaluation come from lessons learned through implementation and peer review.				

Table 2. Table 1 Applied to Specific Example of Group Work

Growing Pains: Issues of Scale and Content

The small group, flexible, writing-intensive model presented thus far works well for 35 students. How can we scale up to accommodate increasing enrollment and maintain the intimacy of a small group feel without exceeding our limited course budget? And, how can we provide a meaningful, grounded, and foundational learning experience about leadership that helps launch students toward continued learning and application throughout their college experience (and ultimately into their career)? These questions of scale and content present two primary challenges in our course design - scale and content.

Issues of Scale

To scale up, we need to release our felt need to be the central source and channel for content delivery. We need to be open to, and rely on, the Student Assistants to facilitate the small group learning process and provide them with experiences as peer teachers and leaders. We invested significant time for SA orientation up front and throughout the semester to emphasize student-led discussions and group work to streamline the process. This allowed SA's and students to focus on discussing and relating to the course content rather than being bogged down by the dynamics of dysfunctional groups.

The SA model proved to be financially viable (SA's were paid hourly for approximately 6-8 hours per week), mutually beneficial (Freshmen students and SA's alike had an engaging learning experience), and helped to bridge the age and "relevance" gap between the faculty and first year students by offering a one-on-one senior peer instructor model. Over time, this model can become self-sustaining as we build in a succession model by inviting students who took the course during their first year to return in future years to teach as SA's. This self-sustaining approach also reduces the SA orientation needs and maintains consistency and quality through the years. We are also exploring options for SA's to use their teaching experience as a project for a yet-to-be-developed advanced leadership seminar they can opt to take for credit in lieu of receiving payment. This credit-based approach to working with SA's further sustains the course as a financially viable and scalable model, builds in succession planning, continuity and quality of instruction, and provides a path for leadership development for students throughout their undergraduate experience.

A strong team of SA's serves as a leverage point for growth as the faculty role becomes one of setting the overall content and direction of the class, facilitating the progression of the class at the large group level, and mentoring the SA's to lead their small groups. The SA's gain first hand real world professional experience working with a faculty mentor to help them manage their small groups, provide peer review for the students, and guide them in their role as a "Project Manager" to work with students on their semester projects. They also practice communication skills while leading mini-presentations and facilitating small group discussions in class. SA's are also seen as role models for the first year students and engage with their "boss" as they are expected to provide formative feedback about the class and the lead instructor.

Finally, the issue of larger physical space will be addressed in the "Lessons learned and future work" section later in the paper.

Issues of Content

With a commitment to release the need to be the single instructor and sole source of information and content, it becomes easier to find ways to facilitate a process of laying a common direction for all, then turning it over to students to make meaning. Rather than assuming that students are clean slates when it comes to leadership, we assume that each student has a set of experiences upon which we can build. Today's students are more globally aware than our students were just 10 years ago and are better connected to the vast resources available at their fingertips. What is often missing, however, is a maturity for information literacy to discern useful, relevant, and legitimate information. To address the issue of engineering content coverage, personal relevance, and information literacy, we remain flexible to build lessons around current events that reinforce the core content of leadership development.

For example, during the Fall 2011 semester, *Time* magazine published an article about the failure of the nano-car – an automobile manufactured in India, marketed throughout the Far East and Europe (Thottam 2011). The short article highlighted the combination technical, cultural, political, and economic issues that led to the product failure. The story provided an opportunity to explore a case study that connected real life engineering issues with recent classroom discussions of leadership skills, culture, personal communication styles, and benefits of diverse groups for brainstorming. Using a brief in-class self-assessment on information processing styles (brainstormer, problem solver, doer, and processor), we grouped students by like-style and gave them the short, densely packed article to read during class. We then asked them to brainstorm a list of all factors that led to failure of the car (at least 10 were cited in the article). As expected, the brainstormers jumped right in and developed a long list of factors on the white board. The processors took their time to think and plan before committing any words to the board. The doers and problem solvers wanted to skim the article and jump in to solve the technical problem before listing all the contributing factors.

In the middle of their group process, we paused to highlight a few key points. The purpose of the activity was not necessarily to fully understand the problems and solutions for the nano car. Rather, the purpose was do demonstrate, through a relevant and current engineering example, how their individual and group tendencies play out in a semi-realistic workplace setting (e.g. brainstorming solutions for an engineering problem) and make direct connections to course content.

Another example of pausing during the regular flow of class to take advantage of a leadership learning moment took place when we experienced a failure of classroom communications. Nearly half the class missed changes to the details and due date for an assignment that was announced in class. During class the following week, we explored the situation as a case study

and connected it to lessons on communication breakdowns. (The changes were announced last week. What happened such that half of the class did not respond to the announcement?) Abstract and theoretical models of communication breakdowns were brought to life by making direct and real time connections between course content, an event that they were experiencing that related to their life, and consequences of poor communication.

The "Not-So-Hidden" Curriculum

Both of the examples above required the instructor to go "off script" to engage students. The benefits of doing so can be considered part of the hidden curriculum, or "lessons which are learned, but not openly intended" (Martin 1983). Though not explicitly stated, all four of the challenges mentioned at the outset of this paper are addressed by these "hidden lessons". We expand our curriculum by shifting our pedagogical framework such that the rigor and quality of learning is not compromised.

This approach also creates new entry points through which students can approach the course lessons that helps diversify our enrolled student population – rather than a "one size fits all" approach. Doing so addresses the achievement gap - discrepancies in our educational institutions that tend to unintentionally benefit majority populations over underrepresented minorities (KewalRamani et al. 2007). The underlying issues and root causes that lead to the achievement gap are deeply embedded in our society and have a long history that will not be resolved overnight, or within a single course. But that does not mean we should not address this critical issue whenever and wherever we are able. For this course, we used the engineering concept of "universal design" to address a common critique that efforts to close the achievement gap amount to preferential treatment for minorities at the expense of majority students. Universal design fundamentally states that there are effective designs that can benefit all, and may disproportionately benefit those who are most in need (think sidewalk curb cuts intended to help those in wheelchairs, but also assist others in maneuvering from the sidewalk to the street level). This same concept can be used in educational design for learning experiences that are good for everyone, but may disproportionately benefit those most in need.

There is also a hidden agenda to address naysayers who believe that leadership development on a larger scale cannot be done amidst tight budgets and dwindling resources. The existence of a scalable model that engages students early in their college career and involves alumni, industry, and the community can help get the next rung of faculty and administrators on board who may currently be resistant to change or hesitant to get involved. The existence of this type of course offering can help with alumni and industry relations by providing campuses with something tangible to point to that says, "this is what we're doing to address the need for leadership development". Good community, alumni and industry relations benefits fundraising, engagement in career fairs and hiring practices, and overall positive community public relations.

Finally, let's not lose sight of the impact on the students. A course like this, in their first year shows institutional commitment and embeds the importance of leadership from the start to help students establish critical skills that will carry with them throughout their college and professional careers. We have existence proof that iterative change can happen without wholesale curriculum redesign - though that may be what is ultimately needed.

Lessons Learned and Future Work

The specific lessons learned are too numerous to fully cover here, so they are presented below as five broad lessons.

1. Engage in teaching as a research endeavor (CIRTL 2012).
2. Forge campus and community partnerships with functional roles.
3. Situate tradition within the context of diverse contemporary and future needs.
4. Make a large campus feel small.
5. Commit to implementation despite real and perceived barriers.

Teaching as a Research Endeavor

The first lesson learned is to anticipate success by creating a plan that fulfills our professional obligation to disseminate successful models for adaptation by others. Engage early with your Institutional Review Board (IRB) or Human Subjects Research Committee so that you can use course evaluations, student work, and other student data to share with others. We are in the process of doing that now, so at this time, we can only report general observations, not specific student data. We can report, however, that students have made gains in all of the stated course objectives and we have discovered many other unanticipated benefits.

Campus and Community Partnerships

Fundamentally, we learned that there is a need and a demand for student leadership development in many forms. When each of these multiple forms exists in isolation, we fragment the student experience and deep learning and application becomes more of a challenge. To the extent possible, nurture collaborations and partnerships with multiple units on campus and the broader community to bring a richer experience to our students. Doing so helps broaden and connect the student experience, ground it in reality, and forge unanticipated connections. For example, throughout the course, we had defined, functional, and purposeful course connections with the following campus and community organizations:

- College of Engineering Student Leadership Center *(slc.engr.wisc.edu)*
- College of Engineering Career Services (ecs.engr.wisc.edu)
- College of Engineering Student Orientation and Registration (newstudent.wisc.edu/soar)
- Center for Leadership Involvement, Adventure Learning Program, and Leadership Certificate (cfli.wisc.edu)
- The Morgridge Center for Public Service (morgridge.wisc.edu)

- Center for First Year Experience (newstudent.wisc.edu)
- Multiple local engineering firms
- Dozens of campus alumni
- Multiple campus student organizations

Forging these connections took significant time and energy, but we embraced it as an investment in the future – the future of our students, the future of advancing the mission of our campus, and more broadly for our society.

Balance Tradition with Diverse Contemporary Needs
The course content must balance a respect and understanding of tradition while embracing contemporary and future needs. It must be relevant, real time, and interesting from the student's diverse perspectives. The diversity represented by any group of students is profoundly larger than a single instructor, and must be intentionally included as a core construct of the course. This proved to be true with both the SA's as instructors/learners, and with the first year students as learners/peers. Both the students and the faculty benefit from releasing control in the classroom to allow the students to take ownership of their learning. Some of the most insightful learning came from students, so the faculty member must be open to allowing that to happen.

Make the Large Feel Small
Especially at large public universities, we need to find ways to make a large campus feel small. The vast majority of a first year student's academic life exists outside the classroom amidst a swarm of humanity, often times much larger than their hometown and high school experience. As faculty members, we need to find ways to stay connected with student life outside of class and decrease the barriers that exist between us and our students. We need to be seen as human, approachable, and empathetic.

At the University of Wisconsin-Madison, we are fortunate to have access to the Wisconsin Collaboratory for Enhanced Learning, WisCEL (wiscel.wisc.edu). WisCEL is, "an innovative approach to learning that combines deliberate choices of physical environment including multi-use spaces, technology that supports both peer-collaboration and self-paced learning, and software which provides immediate feedback to students on assignments and exams and allows increased instructor time with students." (WisCEL, 2012). If a space like WisCEL is not available on your campus, consider space at the student union, or even with small groups in a department conference room. The key point is to get out of a traditional classroom to open up options for a different kind of thinking, learning, and teaching that more closely resembles a workplace environment.

Commit to Making it Happen
Several influential leaders throughout history have made the call for change by saying, "If not us, who? If not now, when?" It can be difficult to overcome the inertia of inaction because of

perceived barriers. We can always find a reason to *not* do something (time, money, lack of support, uncertainty, etc.). It is also easy to sit on the sidelines and hope someone else acts in our stead.

Continued Improvements and Future Work
The mid-course and end-of-semester evaluations, and final student projects indicate that the first three offerings of the course have been successful. Yet the nature of this course, the evolving role of leadership in engineering, and the growing demands for enrollment point to several areas for future work and development.

We need to expand our efforts to continue leadership development beyond the first year experience. To that end, we will explore ways to more intentionally connect with students on internships and co-ops as they are gaining real world experience. As the course expands and requires a larger pool of SA's, we can explore an upper level cohort model for an advanced level leadership seminar for the SA's. We also want to remain connected with our students after graduation by building in more points of interaction with alumni once they enter the job market.

Course activities will continue to evolve as we experiment with new ideas. Field trips to local engineering companies, expanded connections with campus and community organizations for service projects, and the growing spectrum of creative classroom activities from SA's will be integrated into future semesters. With this growth comes a need for a more defined course infrastructure. Online resources, banks of readings and course manuals for leading various course activities, and moving some boiler plate lecture material to an online environment are all avenues to pursue to create a course knowledge base and infrastructure for the future. Finally, a more formalized approach to educational research is needed to show baseline data and demonstrate impact.

Adapting to Other Institutions
Every institution has its own culture complete with opportunities and obstacles. The details above provide specifics for how we planted seeds for success at our institution and plan to grow. The guidelines below provide some touchstones to consider when adapting to your institution.

1. *Embrace the existing culture.* For many institutions, curricular reform to consider leadership development may not be a top priority. Your starting point may be student organizations, co-ops and internships, campus partnerships, or perhaps faculty development. Regardless of the starting point, an understanding of the current realities of your institutional culture is critical to knowing how to work within it as you advocate for further involvement in leadership development.
2. *Start small and grow.* Successful places to start will require leverage points with high potential for short-term impact. Our starting point was a pilot course for 25 first year

students. We knew there was interest, we had top-level support, and we had a need to relieve enrollment pressures for other introductory courses. Your starting point may differ, but start somewhere.

3. *Allow multiple entry points for involvement.* Provide ways that individuals can engage in your efforts with varying levels of involvement including advisory, advocacy, planning, and central involvement in implementation. If structured well, everyone interested can find a way to contribute at any level of involvement.
4. *Work with the "choir".* Understand that some people may resist or have no interest in getting involved, so start with those who are receptive. Ask yourself, "Who are the 10% committed core I can rely on?" Then find ways they can be actively engaged. Do not ask for, or expect much from uninterested individuals, but also be cautious to not be exclusionary. You may be surprised at who is interested in getting involved if you genuinely invite them and have a role they can play in the effort.
5. *Collaborate with others beyond the "usual suspects".* Where you have a need you cannot fulfill yourself, engage with others on campus and the community. Realize that each person will have their own personal motivators, level of readiness to engage, and ability to commit, so meet them where they are and co-create a mutually beneficial role.
6. *Seek frequent and honest feedback.* Be intentional about requesting feedback in multiple formats and from a broad spectrum of individuals. Then, be responsive to what you learn. This may require a thick skin, but will ultimately result in a more inclusive and sustaining initiative.

If Not Us, Who? If Not Now, When?

There are tangible and substantial ways engineers can engage in addressing the grand challenges of our time if they have the requisite leadership skills. For readers who feel this work is a distraction from the core technical curriculum of engineering, we ask that, at a minimum, you do not create obstacles for others who want to engage in this work. For readers who remain uncertain or unable to dedicate the energy necessary to take on a new course like this, we invite you to consider other ways you can engage in leadership development that are less time intensive and fit your current situation. For those of you inspired to take action, we hope this paper has provided you with some insight into how to take the next steps.

As educators, we can model for our profession what we would like to see on a global scale. Technical skills, individual motivation, and good intentions are necessary, but not sufficient conditions to have the scale of effort we need to make progress. We also need intentional leadership development to move from idea and intent to implementation and impact. For those of you motivated by this challenge, developing a course like the one presented in this paper can provide a next step in the journey. Whether you are an administrator looking to initiate change, a faculty member searching for ways to broaden your influence, an alumni looking to give back to your school, or a student looking to jump start your career, we all can have a role in these efforts to make a difference in our world.

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Appendix D – Impact Summary of Course Projects for Engineering Leadership Course

Fall 2012

Group #	Description	Dollars Raised/ Number People Affected
1	Tutored students in math and science at Jefferson Middle School- 6hr/person	3-5 Students
2	Created an Introduction to Engineering class for students at Leopold Elementary	One class of 5th Graders (20-25 Students)
3	Worked with Dane County Habitat for Humanity and put together a team to help install flooring in a Habitat house.	One Family (3-5 People)
4	Worked with Dream Bikes to gather donated bikes and repair them	Five Bikes Donated/Fixed
5	Created a Fundraiser for Hurricane Sandy Victims and sent money to the American Red Cross	Raised $190
6	Held a Badger game viewing fundraiser to benefit the Make a Wish Foundation	Raised $250
7	Raked leaves in the Lakeshore area of campus	Lakeshore Residents (No outside Volunteers)
8	Twice performed music for the residents of Capital Lakes Retirement Community	10-15 Residents
9	Raised awareness for environmental issues on campus and participated in multiple cleaning events in the Southeast area of campus	Southeast Residents (22 Outside Volunteers)
10	Sold pizza and candy to help benefit Global Medical Brigades	Raised $299
11	*Planned to host a dodge ball tournament to benefit the River Valley Food Pantry	Lessons Learned

Students involved: 33
Money raised: $750
Hours of service: ~400 hours
Individuals impacted: at least 75
Community orgs served: 11

Appendix E – Representative Excerpts from Student Servant-Leadership Projects

Fall 2012

Student #1

Our project, in many ways, helped me fully grasp the concepts of servant leadership. I originally thought a leader was someone who could evenly disperse orders and successfully accomplish goals. However, now I feel that the most ideal form of leader is someone who (although may not receive credit for their doings) gives back to the people, and in doing so, successfully benefits their society, in one way or another. Drawing upon my feelings towards servant leadership and applying them towards my future career goals, I have made some slight alterations towards my long term goals. No longer do I find myself wanting a job that merely pays well or shows my position in life, but rather I want to find my passion in something (that may not be monetarily ideal) that I love to do.

Student #2

As we discussed in class, the servant leadership model is more about how to serve others by leading or encouraging a group of people to achieve a goal, instead of "controlling" others to do something for own benefits or for one's domination of power. Our project definitely served others by installing the flooring as part of the house construction. The staffer of Habitat for Humanity told us that the house was completely constructed by volunteers from the organization, starting from framing to inside decoration, and the house would be sold in a low price without interest on loan. This will help an unfortunate family a lot, providing them a comfortable and affordable living condition."

Student #3

This Schools of Hope program fits seamlessly into the service leadership model in many aspects. The demand for tutors is incredibly high. Layne stated in my orientation that she currently has 30 volunteers that come weekly, but has tutor requests that near 40 more for students marked as potentially falling behind. Cortina on her own had requested that she would like to have a tutor help her in class nearly 2 months prior to my involvement. I didn't derive my power from needing to prove it to anyone or taking it when I first began either. It was thrust onto me from the teachers, and not only Cortina, but also other students, as it was common for them to ask for my help as well.

On a personal level I feel as though this opportunity has given me even more of a sense of belonging since arriving here in Madison. Each week is a rewarding endeavor, and it's something that I've committed to continuing into next semester. Although I probably wouldn't have been introduced to this volunteering opportunity without being assigned this project as a catalyst, I find myself intrinsically motivated to work hard and give Cortina the best guidance possible. I know that she's been learning and accomplishing more in class because of my efforts,

and my actions are a relief to her teachers, parents and other relatives knowing she's not falling behind. Beyond just those immediately affected by Cortina's successes, the Schools of Hope program extends not only through Jefferson Middle School, but the entire public school system here in Madison. This collaboration of mentoring has given hundreds of students a better shot at learning in subjects where they struggle….

From this introduction to engineering course, I feel like my actions from getting involved with the Schools of Hope program has been my greatest achievement yet on campus. This I know never would have happened if it weren't for our service leadership project.

Student #4

I learned a lot from this experience about what the definition of leader is and also, what the definition of an engineering leader is. At the beginning of the semester, I found myself overwhelmed with what the definition of a servant leader and the all of the different models we covered in class. Since this project was about helping the Madison community and was something I was very interested in, I found myself a lot more engaged. I found myself constantly trying to find bikes to help families in financial need during the holiday season. This relates back to the servant leadership model from the first couple weeks of class.

Student #5

We met with our contact, Brenda, at Capital Lakes Retirement Community. Her positive attitude was a breath of fresh air for us on a Sunday morning. She introduced us to a group of residents we would be performing for in the lobby. We played a few songs and even got some of the residents singing along. I truly felt like I was making a difference in their day. Through their smiles and applause I could tell that we had brought a positive change to the environment in the community. It is a very humbling experience to have people sit and listen to our music that we have worked so hard on. They enjoyed our performance so much that they asked us to come back after Thanksgiving break. I set up a date with Brenda for us to perform some Christmas music. [My partner] and I, again, created a set list of songs to perform. We worked hard to translate some classics to guitar and, in the end, had a set of around 6 songs.

Student #6

As mentioned by William Arthur Ward, "We must be silent before we can listen. We must listen before we can learn. We must learn before we can prepare. We must prepare before we can serve. We must serve before we can lead." The quotation mentioned in the previous sentence, was my personal inspiration as my team and I completed our servant leadership project required to successfully complete this course. As a group, my teammates and I were able to make our idea a reality as we completed our project entitled "Badger's Make-A-Wish" during the Fall 2012 semester.

Our main goal in "Badger's Make-A-Wish" was to raise money for the Make-A-Wish foundation while combining my teammates and my personal interest in athletics. Successfully

through collaboration and brain-storming my teammates were able to agree on a selling Make-A-Wish stars in the lobbies of Smith Hall and Ogg Hall, as well as organizing a game-viewing party in the basement of Sellery Hall when the Badger football team played Indiana. Although most was successful within our project, we did encounter a few speed bumps along the way.

After previously setting a goal of earning fifty dollars through our event, we were surprised and thankful to have surpassed it. Our activities generated $250 dollars to be given to our foundation, Make-A-Wish. Our time, cohesion, networking, and dedication to our project paid off.

Student #7

Quoting through his article *The Case for Servant Leadership,* Kent M. Keith states that "Servant leadership is not only a moral approach to leadership, it is the most effective way of leading." Although some may argue this is biased, I truly believe in the effectiveness of Servant Leadership. Within his article, he compares the Power Model to the Service Model. However, I have concurred under my own conviction, that in being of service it takes both power and morality. It is stated the power model has problems within it, my belief is that without those problems of creating conflicts, we would not be able to understand the views of everybody. For example, sometimes people don't speak up until conflict has risen to the surface. To conclude, my conviction states that I have learned the service model and the power model need to occur in tandem in order to be a successful Servant Leader.

Appendix F – Course Syllabus For InterEgr 103

Core Competencies for Engineering Leaders
Fall 2012

Course overview and syllabus

General Course Information
Mondays, 2:30-4:00
Room 405 Wendt Commons

NOTE: This syllabus is subject to change.
Please rely on course website for the most current information!

Instructor team

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NOTE: If there are circumstances that may affect your performance in this class, please let any of the instructors know as soon as possible so that we may work together to develop strategies for adapting assignments to meet both your needs and the requirements of the course. The McBurney Disability Resource Center (263-2741) provides resources for students with disabilities. You will need to provide documentation of disability to them in order to receive official university services and accommodations.

How to be successful in this class…
…direct advice from past students.

Below are direct quotes from past students when they were asked, "What advice would you give to students taking the course next semester?"

1. Come to class each week ready to talk about the readings.
2. Go to office hours, and make it a point to get to know the SAs. They will be very helpful and essential to your success in the course.
3. I would advise them to not blow it off and to make sure to embrace all the opportunities opened up by this class.
4. Be open and participate!
5. Pay attention, it is all valuable information. Take advantage of how open the instructor and SA's are to talking about anything.
6. Participate in-class and out-of-class and think not as much about what you can about this class but what you can learn about yourself.
7. Don't give up on it right away. At first I didn't like the class but it got much better.
8. Do the homework assignments such as the career fair and student organization fair, because they help you start getting involved in campus.
9. The ideas aren't linked that much to engineering but are extremely important to being in a workplace environment so pay attention because it will be very useful in the future.
10. Start the service project as soon as possible and not wait.
11. Just go to class and have fun. None of the papers/reflections are that bad. Try to come up with a leadership project early on though.
12. Ask yourself, self-assessing questions and take the time to learn the answers. You can learn so much about yourself if you engage in the activities.
13. Apply for the Leadership Certificate at the beginning of the semester so that you can work on it throughout the class.
14. Do your homework before the day it is due.
15. Prepare to learn about what really matters in engineering.
16. Be engaged, its the best way to take something out of the course.

Introduction

The "Wisconsin Experience" that you have begun is an approach to education characterized by intentionally integrating in- and out-of-class learning experiences that engage you in active student leadership while at the University of Wisconsin-Madison. It is grounded in our 100 year old progressive history of graduating extraordinary citizens able to have a significant and positive impact on our world.

This course was created to continue this history by directly responding to students, alumni, and prospective employers who repeatedly tell us that formal leadership development is missing from the otherwise strong technical Engineering curriculum. The course is centered on the Social Change Model of Leadership Development and a commitment to Servant Leadership. It is based on the premise that leadership is not simply a place of positional authority. Rather, leadership is a process that can be learned, and includes a *responsibility to act in service to others* instead of a role of exerting *control over others*. Everyone has the potential to be a leader, but it takes intentional development.

It is common for engineers to have highly developed technical skills. A challenge many practicing engineers face is how to effectively apply their technical skills amidst an increasingly complex professional environment where they are also expected to integrate non-technical issues into their work.

Broadening your view of engineering, and integrating your technical ideas into the landscape of social, political, economic, environmental, and human dynamics will help you further develop and serve a sustainable society. Historically, however, leadership and service have not been integrated into a formal technical engineering curriculum.

To meet this challenge, and to build on solid technical skills, engineering leaders of the future need to intentionally develop a complementary set of people skills, often times referred to as "soft skills." But "soft" does not imply easy, for people skills are often times the most difficult to develop for technically focused professionals. People skills manifest themselves more specifically as communication styles, interpersonal behaviors, a commitment to service of others, systems level understanding of organizational dynamics, and management skills for developing multi-disciplinary, multi-functional teams. Often times, these "soft" skills are what will limit or expand your career opportunities.

This course is not intended to be a one-time event or an endpoint. Rather, it is intended to serve as a launching pad for your ongoing career planning and leadership development as part of a life-long continuous improvement process. No matter where you are in your personal and professional development, we all continue to have room to learn and grow.

Therefore, this course is designed to help take you from wherever you are, to the next step in your learning and engineering professional development. We will cover a wide array of topics, starting with an overview of historical and contemporary models of

leadership that provides context for a deeper focus and exploration of the theory, practice, and application of the Social Change Model for leadership. Coupled with the Social Change Model, we will also learn how Servant Leadership, a leadership approach established by Robert Greenleaf, applies to engineering and our need to be of service to society. In one of his defining writings, Greenleaf writes,

> *The servant-leader is servant first... It begins with the natural feeling that one wants to serve, to serve first. Then conscious choice brings one to aspire to lead. The difference manifests itself in the care taken by the servant — first to make sure that other people's highest priority needs are being served. The best test, and difficult to administer, is: do those served grow as persons; do they while being served, become healthier, wiser, freer, more autonomous, more likely themselves to become servants? And, what is the effect on the least privileged in society; will they benefit, or at least, not be further deprived?*

The questions posed by Greenleaf are questions that can be at the heart of learning engineering professional practices and will serve as a framework for this course. The themes listed below provide a map for the specific weekly topics. Throughout the semester, your assignments are designed to expose you to a wide array of different perspectives, provide you opportunities to make meaning of what you learn, and put into practice the tools and lessons of the course.

Theme 1: Introduction and Overview of Leadership Models
Theme 2: Social Change Model and Servant Leadership
Theme 3: Moving to Action
Theme 4: Lifelong Learning

Course goals

As with most learning opportunities, you will get out of this course as much as you put in. So, we invite you to explore the topic of leadership, experiment with new ideas, and put what you learn into a personal context that you can use as a foundation to continue to grow throughout your career.

The course goals are aimed to help you develop as a future leader by:

1. Raising your awareness, appreciation, and knowledge of leadership issues and personal choices,
2. Engaging in experiential learning to apply and develop critical leadership skills.

More explicit goals are listed below and will be connected to each weekly lesson. We will evaluate how well we meet these objectives by engaging in periodic assessments of our progress throughout the semester. These assessment activities will include self-assessments, peer review of your work, and instructor feedback.

Students will reflect on, and demonstrate knowledge of:

10. A personal vision for your professional future and the spectrum of career opportunities available to fit your personal vision,
11. How your strengths, leadership potential, and development needs can help you achieve your personal vision,
12. The leadership role that engineering professionals can play in service to a breadth of social, political, environmental, economic, and global issues,
13. How to access resources to assist ongoing leadership development.

Students will experience and be able to:

14. Comfortably and professionally communicate directly with peers, practicing engineers and adult professionals,
15. Apply and reflect on the "Seven C's" of the Social Change Model through engaging as Servant-Leaders in a stewardship service project,
16. Apply teamwork and leadership skills necessary to embrace individual differences and help groups collaborate on shared aims and values,
17. Use new skills, tools, and insights to advance ideas from concepts to action,
18. Craft an action plan for future leadership development.

Course content and structure

This course will not give you the "Top 10 Essential Skills of a Leader", then send you on your way. Our belief is that specific skill-based learning will have limited long-term impact unless it is grounded in a broader framework, connected to a locally and personally relevant context, and internalized by the individual person.

You will learn direct connections between the technical curriculum from other courses, and your personal role as an engineering leader. Course materials have been pulled from a wide variety of books, articles, case studies, online resources, assessment tools, and personal experiences of the instructors, guest speakers, and you - the students. You will learn about individual characteristics and competencies of leadership in the context of global understandings of the social, political, and economic impacts of engineering.

The Social Change Model of Leadership focuses on the seven core values listed below that progress through increasing levels of involvement from individual to group to social values. You will engage in activities designed to help you find personal connections with the values, and apply them in real world experiences.

Core values of the Social Change Model of Leadership

1. Consciousness of Self
2. Congruence
3. Commitment
4. Collaboration
5. Common Purpose
6. Controversy with Civility
7. Citizenship

The weekly course topics, briefly listed below, are structured into 4 primary themes with specific topics covered each week to support an in-depth exploration of each theme.

Theme 1: Introduction and Overview of Leadership Models
- Week 1: Introduction and overview
- Week 2: Engineering in context – Field trip to Saris Cycling Group
- Week 3: Perspectives on engineering and leadership
- Week 4: Personal meanings of leadership, Project teams

Theme 2: Social Change Model and Servant Leadership
- Week 5: Individual styles, Consciousness of Self, Congruence, and Commitment
- Week 6: Teamwork and group project work
- Week 7: Controversy with Civility
- Week 8: Citizenship
- Week 9: We can, but *should* we? Ethical issues in engineering

Theme 3: Moving to Action
- Week 10: Creativity and innovation
- Week 11: Emotional Intelligence and Consciousness of Self (revisited)
- Week 12: Balance, time management, and workplan development

Theme 4: Lifelong Learning
- Week 13: Generational dynamics in the workplace, lifelong learning
- Week 14: Course wrap up, lessons learned

This course was initially offered as a pilot last Fall and has been adapted based on extensive student feedback. The course satisfies two credits of the required Freshman core curriculum for Engineering students, and satisfies part of the criteria toward earning a campus Leadership Certificate (http://cfli.wisc.edu/leadership_certificate.htm).

Our weekly 90-minute class periods will typically follow the outline below:

- Announcements, connections to previous weeks, and introduction to topic
- Brief presentation of weekly material (usually by lead instructor, sometimes by guest speaker with expertise in weekly topic)
- Small group (4-5 people) in-class discussion to process presentation
- Active engagement in activity (e.g. simulations, role play, case study)
- Wrap up and look ahead to future weeks

Evaluation of your learning

A total of 100 points is available and distributed through a variety of assignments as detailed below.

Weekly prep, participation, readings	10% (1 pt/week for weeks 4-13)
Weekly reflection writings	10% (2 pts each for 5 responses)
Homework assignments	50%
Out-of-class activity	5%
Final project report	20%
Instructor's discretion	5%
TOTAL	100%

Your final grade will be figured based on the scale shown below with a total of 100 points available.

A = 90-100
B = 80-89
C = 70-79
D = 60-69
F = 0-59

A/B and B/C grades will be determined for borderline cases on an individual basis and at the instructor's discretion.

Preparation, participation, and readings: This class is intended to be discussion-based and action-oriented with active involvement from everyone to contribute to the learning of others. Ten percent of your overall grade is specifically tied to your level of involvement, engagement, and preparation for class. **One primary component of this is that you have done the reading assignment and come to class ready to discuss what you learned!**

To be successful in this course, you are expected to:

- Attend class prepared to actively participate in all class activities (in-and out-of-class),
- Provide constructive and honest feedback to peers and instructor regarding all course activities,
- Find ways to be a leader within the class activities, while allowing others to do the same,
- Make explicit ties between course content and your work outside of the class in other courses, organizations, activities, and current events,
- Actively contribute to the learning of others.

Reflection writing: Some weeks, you will have a brief reflective writing assignment. These are not intended to be formal assignments like your other homeworks (**though grammar and spelling do count!**). Rather, they are intended to be informal assignments that give you a chance to respond with whatever is on your mind regarding the question of the week. Do not sweat over whether you have the perfect wording – we are looking for three main elements in your weekly reflections:

1. Is it thoughtful and genuine, or did you throw it together at the last minute just to have something to turn in?
2. Do you connect your thoughts to the readings, mini-lectures, and other class discussions from the week?
3. Do you do more than just mimic back something that you heard or read in class?

Homework assignments: Assignments will be graded on a 5-point scale as defined below.

5 = exceeds expectations
4 = very solid work, meets expectations
3 = with a bit more effort, this would be very solid
2 = below expectations
1 = poor effort
0 = not turned in, or turned in too late for credit

Late assignments and attendance: You are expected to attend all classes and complete all of the activities outlined for each week on time. Unless prior arrangements are made with the instructor, or in cases of exceptional circumstances, the due dates listed in the course calendar are firm.

If you need to miss a class, it is your responsibility to communicate your absence to your instructor BEFORE class. Otherwise it is considered unexcused. It is also your responsibility to follow the outline, plan ahead as needed, and submit your work on time each week. **Late assignments and participation in weekly activities will result in the loss of 1 point per day for each overdue activity.**

Assignments and class activities

You are expected to engage in, and complete, all in- and out-of-class activities that are detailed on the following pages. All assignments should be submitted via the dropboxes on the course website. The specifics for each assignment are listed below, but the following guidelines apply to all assignments:

1. Submissions should be in Word format
2. Filename should be, "LAST NAME, Assignment #.doc"
3. Spelling, grammar, punctuation, format, etc. are important, so proof read your assignments before submitting!

Class preparation, participation (1 point each for weeks 4-13)
Written reflections (2 points each for 5 assignments)

Each week, you are expected to prepare for, attend, and engage in all class activities. Your weekly points are a combination of preparation before class, and participation in-class. Some weeks, you will also have an informal reflective writing assignment due. You will not receive detailed feedback on the reflective writing assignments. They are intended to be a place for you to process your thinking and submit it so that we have an idea of what you are learning and the connections you are making. Details for your weekly reflection questions will be discussed in class each week.

Participation, preparation, evidence that your completed the readings, and weekly reflections will be the primary determining factor for borderline grades. Instructors will record weekly preparation and participation grades at the conclusion of each class period.

Your weekly points will be determined as follows:

- Full credit if you show that you are prepared for class, have completed the reading, constructively participate in class, and/or submit a thoughtful weekly reflection.
- Partial credit if you are not prepared, do not clearly show that you have done the reading, do not constructively participate in class, and/or submit a superficial weekly reflection assignment.
- No credit if you are absent from class, do not do the reading, do not submit a weekly reflection, or are disruptive or disrespectful in class.

Homework 1 – Career Fair and Student Organization Fair reflection (5 points, due September 30th)
Attend the Student Organization Fair (**September 11th, 5:00-8:00 pm Kohl Center**) and Career Fair (**September 21st, 24th, and 27th 11:00-5:00 in Atrium of Engineering Centers Building**). Visit at least 3 booths at each (two that are familiar to you, and at least one that catches your interest, but you know nothing about).

Write your responses to the following questions (500-700 words)

- Which companies and student organizations did you visit? Why?
- What companies and student organizations have opportunities that appeal to you? Why?
- Which companies and student organizations do not have opportunities that appeal to you? Why?
- Do your experiences at the career and student organization fairs inform your views on your professional future or ways you will get involved on campus? Why or why not?

Homework 2 - Two part assignment (10 points, due October 7th)
Part 1: Reflections on Leadership Models (500-700 words total).

- Of the leadership models we covered in class, which one(s) resonate with you the most? Why? How does it relate to your personal vision for your professional future you wrote in Week 1?
- Of the leadership models we covered in class, which one(s) do not resonate with you? Why?
- Reflecting on all leadership models we covered in class, generate your own model of leadership that extracts key aspects from multiple models, as well as your own thoughts and experiences. Explain your model, include graphics as necessary, name your model, and explain why you chose that name.

Part 2: Proposal, context and plan for Servant-Leadership service project.
As a team, complete and turn in the "Launching Your Project" worksheet distributed in class and available on the course Moodle site. Further details will be discussed in class.

Homework 3 – Two part assignment (10 points, due October 21)
Part 1: Reflections on self-assessment (500-700 words total).

- What did you learn from completing the True Colors self-assessment we did in class?
- What surprised you about the results you received?
- What was consistent with what you expected about the results you received?
- What new questions arise from the self-assessments regarding your individual styles, strengths, and areas of needed development?

- What are the implications of your self-assessments for how you work and communicate with others in a professional setting?

Part 2: Write a one-page response (~500 words) about your experience with the Earthquake activity. Below are some guiding questions to consider.

- What is your main take-away and/or main insight from this activity as it relates to leadership and teamwork?
- What aspects of the activity led you to that main insight?
- Given your experience working in a team to arrive at consensus, reflect on how you worked through differences of opinion. What did you find most challenging? How did you overcome these challenges?
- What stands out for you regarding your personal behaviors as they relate to MOB's, TOB's, and SOB's?
- Overall, what did you learn about the collaborative process?

Homework 4 – Two-part assignment (10 points, due November 11th)

Part 1: Examples of Leadership (500 words)

- Think of a contemporary leader who embodies your concept of leadership. Who are they?
- How do they embody your concept of leadership?
- What have they been able to accomplish through their leadership?
- How is this applicable to the discipline of engineering?

Part 2: Personal vision for professional future (500 words)

- Refer back to the Personal Vision for your professional future that you wrote in Week 2 of the course.
- Include your original vision from Week 1 (without edits) and reflect on what you've learned in the first 10 weeks of your college career.
- Has anything changed about your future vision?
- If so, what and why?
- What has stayed the same?

Homework 5 – Creativity & Innovation (5 points, due November 18th)

What is a wild-ass idea you have for something you'd like to develop, invent, or improve? This can be an actual product or process, or just a concept you are playing with. Outline the steps in the process you would take to bring your idea from concept to reality. Weave in specific references to the reading for the week and what you learned from the guest speakers.

Homework 6 – Two part assignment (10 points, due December 2nd)
Part 1: This portion of the assignment activity engages upperclass students, alumni and industry representatives, and gives students real world context while developing skills for professional writing, oral communication, and inquiry.

Interview prep during class on November 12, we will:

- Help pair you up with an industry representative (coop, intern, or professional) or alumni for contacting outside of class,
- Develop a set of questions to discuss with your external contact,
- Work through professional approaches to contacting others, and following up after a conversation. (This can be done over the phone, by skype, coffee, or lunch, but should not be simply an email or online discussion).

Interview (to be completed between November 12th and November 30th)

- Using what we developed in class, interview an alumni or industry leader about their work (specific questions to be developed in class).

Reflect on what you learned (5 points)

- Write a one-page summary (about 500 words) that addresses the questions below:
    - Whom did you interview? (Name, company, position and primary role at work, etc.)
    - How did you initiate contact (include copy of email if appropriate)?
    - What did you discuss? What main questions did you ask?
    - What did you learn from your discussion with the alumni or industry leader? If you learned nothing new, please explain.
    - From what you learned, what lessons may you be able to use now? What may you be able to use in the future for your career?

Part 2: Workplan development
Draft a detailed workplan for how you will successfully finish up the semester for all of your classes, projects, finals, outside work, personal commitments, etc. Include intermediate and primary milestones, timelines for completion, potential clash points, etc.

Out-of-class leadership development opportunity (5 points, date TBD based on when you attend your event)

DO NOT WAIT UNTIL THE END OF THE SEMESTER FOR THIS ASSIGNMENT!

Participate in at least one out-of-class leadership development opportunity. This can be a College of Engineering event, something sponsored by another campus unit, or a community program focused on leadership issues. Your assignment is to write a one-page reflection that addresses the questions below:

- What program did you attend?
- What was the primary purpose/context of the program you attended?
- What did you learn from your participation?
- What will you do (or might you be able to do) with what you learned?

Below are some campus resources that you can use to help you find an event to attend.

- Wisc Calendar
  - http://www.today.wisc.edu/
- Center for Leadership and Involvement:
  - http://cfli.wisc.edu/
- Student Leadership Program (SLP) Calendar:
  - http://cfli.wisc.edu/SLP/events.html
- Office of Human Resources Department:
  - https://www.ohrd.wisc.edu/home/
  - On the left-side of the webpage there are upcoming events posted
- Women in Science and Engineering Leadership Institute (WISELI):
  - http://wiseli.engr.wisc.edu/
- Student Leadership Center (College of Engineering):
  - http://slc.engr.wisc.edu/

(NOTE: It is not required, but if you're interested you should make sure to start recording your involvement on your student record!
http://cfli.wisc.edu/cmsfiles/How_to_use_LI_with_web_pictures.pdf)

Servant Leadership project final report (20 points total, due Sunday, December 16th 5:00 pm)

During the first few weeks of the course, we will discuss opportunities for your course project and ask you to commit to a project to complete by the end of the semester. You will work in project teams with 2 or 3 other students throughout the semester. Individual projects, or larger group projects are acceptable, but need to be discussed with the instructor for approval.

Generally speaking, your project needs to address:

1. *Leadership* – your project selection should give each of you the opportunity to actively engage in a leadership role to experience and reflect on your leadership abilities. While doing your project, you should also observe other leaders to learn about their styles, approach, effectiveness, and impact on others.
2. *Service* – your project should provide service to others in some capacity. To borrow from Robert Greenleaf's definition of Servant Leadership:
    a. *Do those served grow as persons?*
    b. *Do they while being served, become healthier, wiser, freer, more autonomous, more likely themselves to become servants?*
    c. *What is the effect on the least privileged in society?*
    d. *Will they benefit, or at least, not be further deprived?*

Additionally, your project should:

- Encompass about a 10-hour total service commitment that can be completed throughout the semester
- Allow you to lead the process of taking an idea from concept to planning to implementation
- Allow you to apply and reflect on how the lessons on leadership covered in class apply to your project
- Include multiple steps and interactions rather than a one-time event

The specific project is up to you and we will discuss various campus resources to help you find an appropriate project. Below are a few general areas to consider for your project.

- Lead a project within a student organization.
- Lead a portion of an effort for a service-leadership project through the Morgridge Center.
- Lead an activity in a community organization where you are already involved (church, local school, etc.).
- Take a leadership role in some aspect of your job if you work outside of school.
- Volunteer to take a leadership role for a project in another course.
- Lead a social or academic event in your dorm.

The final report is intended to be a culmination of your work throughout the semester. General guidelines for what to include are listed below with point allocations (in parentheses). We will discuss further details as the semester progresses.

- Reflections on Servant Leadership project (max 2 pages, 8 points)
    - Context of the organization, purpose of the project, your role in the project.
    - What did you do, learn, and accomplish by doing your project?
    - What did you learn about leadership by your role as a leader on the project and by observing others in leadership positions?

  - What did you learn about teamwork and shared leadership by working with others in your project team?
  - In what ways does your experience with your project connect with your understanding of the Servant Leadership and Social Change Models of leadership?
- Personal development action plan (max 2 pages, 8 points)
  - What was your personal vision of your professional future when you entered the class (you wrote this in Week 1)? Has it changed, or remained the same? How? Why?
  - What are your leadership strengths and areas of needed development? Relate your response to the MBTI assessment.
  - What resources and opportunities are available to you for future development?
  - What is your rough timeline for addressing these development needs? What are your first steps to take?
  - What actions have you taken (or will you take) to continue your development in future years?
- Final course reflection (max 1 page, 4 points)
  - What are your top 3 main take-away lessons from the course?
  - What do you wish we had spent more time on? Why?
  - What do you wish we had spent less time on? Why?
  - What main questions do you have as you leave this course?
  - How will you go about finding answers to your questions?

And finally…

This course may be different than other courses you have had or will have. This course is about you, your experiences, and your learning. It's not about a right answer that we will give you. It's not about a particular way of doing things. We are here to facilitate your learning, learn from you, and continue to improve this course by integrating your learning into how we teach it.

If you ever wonder what we think your answer ***should*** be – stop right there. The answers we want you to have are the answers that are thoughtful and meaningful to you, informed by what we learn in this course. We want you to write, speak, think, and act in a way that is true to yourself while being open to input and feedback from others about how you are doing. In the end, we want you to know yourself well enough that you can be at your best as your career develops.

Course syllabus

Week Date	Main topic	Reading assignments (to be done BEFORE class!)	Out of class activities and assignment due dates
Theme 1: Introduction and Overview of Leadership Models			
1 9/10	Introduction, overview, keys to success	Read Course Overview & Syllabus.	Draft a resume and bring to office hours for quick review before you attend the Career Fair on 9/20, 9/21 and 9/24 Attend Student Organization Fair on September 11th, 5:00-8:00 pm, Kohl Center.
2 9/17	Engineering in context – field trip to Saris Cycling Group	Review Saris Cycling Group website to familiarize yourself with the company we will visit: (www.saris.com) Read The Engineer of 2020: Visions of engineering in the new century. Chapters 1 & 2.	***ARRIVE TO CLASS EARLY TO BOARD BUS FOR FIELD TRIP! BUS WILL PICK UP ON RANDALL AVENUE ACROSS FROM UNION SOUTH.*** DUE: 9/20. 9/21 or 9/24 Attend career fair on Thursday, 9/20, Friday, 9/21, or Monday, 9/24 anytime between 11:00-5:00 in atrium of Engineering Centers Building. DUE: 9/23 Reflective writing #1 – career goals
3 9/24	Perspectives on engineering and leadership	Read Astin, H. S. (1996). "Leadership for Social Change", About Campus (July-August). Read Keith, K. M. (2008), The Case for Servant Leadership. Chapter 3, "Power Model vs. Service Model".	DUE: 9/27 Attend career fair on 9/21,, 9/24, or 9/27 anytime between 11:00-5:00 in atrium of Engineering Centers Building. DUE: 9/30 Homework #1 Reflective writing #2 – project ideas

4 10/1	Personal meanings of leadership Project teams	Read Khan, S. (2005). "Awaken the Leader in You." Supplemental reading (not assigned) Walesh, S., "The Leader Within You: Let it Come Out", http://www.helpingyouengineeryourfuture.com/leader-within-you.htm	DUE: 10/7 Homework #2
5 10/8	Individual styles Consciousness of Self, Congruence, and Commitment	No reading assignment. Watch TED Talk, Susan Cain, "The Power of Introverts"	DUE: 10/14 Reflective writing #3 – best and worst team experience
Theme 2: Social Change Model and Servant Leadership			
6 10/15	Teamwork (cont) Group projects - refined	Read Brunt (1993). "Constructive and Destructive Group Behaviors", Facilitation Skills for Quality Improvement. Read Mindtools website, "Forming, storming, norming, and performing", http://www.mindtools.com/pages/article/newLDR_86.htm	DUE: 10/21 Homework #3
7 10/22	Controversy with Civility	Read, "Conflict Resolution: Resolving conflict rationally and effectively", http://www.mindtools.com/pages/article/newLDR_81.htm Additional reading TBD	None
8 10/29	Citizenship Guest speakers	Read cases and examples (TBD)	DUE: 11/4 Complete mid-course evaluation.
9 11/5	We can…but should we? Ethical issues in engineering	Read cases and examples (TBD)	DUE: 11/11 Homework #4 Reflective writing #4 – Transcendent Man

Theme 3: Moving to Action			
10 11/12	Creativity and innovation	Reading TBD	Track your daily time usage using spreadsheet (to be discussed in class). Bring hard copy of your spreadsheet to class on 11/26. Make contact and schedule your "interview". Assignment is due 12/2 – don't wait! DUE: 11/18 Homework #5
11 11/19	"Consciousness of self" revisited Emotional Intelligence	Read, Bradberry, T., & Greaves, J. (2009). Emotional Intelligence 2.0. Chapter 3, "What Emotional Intelligence Looks Like: Understanding the Four Skills".	Conduct your "interview". Assignment is due 12/2– don't wait! DUE 11/25 Reflective writing #5 – Emotional Intelligence
12 11/26	Balance and time management	Read, Loretto, P., "Creating Work Life Balance for College Students" *(Read the main page article from website listed above, follow at least 3 additional links to learn more about a related topic of interest.)*	Bring hard copy of your time tracking spreadsheet to class on 11/26. DUE 12/2 Homework #6
Theme 4: Lifelong Learning			
13 12/3	Generational dynamics in the workplace Lifelong learning, development plans	Watch PBS video: (http://video.pbs.org/video/2145113304) Reading TBD	
14 12/10	Course wrap up, lessons learned	Read George, M. (2008). "Leadership in the Context of Shaping a Meaningful Career"	**DUE 12/16 @ 5:00 PM** Final report

Appendix G – Letter from Dean of Students for Campus Leadership Council

THE UNIVERSITY of WISCONSIN MADISON

September 12, 2012

Dear Paul,

As we discussed, I am writing to confirm that Chris Carlson-Dakes has agreed to serve as a Planning Team Member from the College of Engineering on UW-Madison's Coordinated Leadership Initiative to begin upon acceptance of this invitation and to end on June 31, 2013.

The Coordinated Leadership Initiative aims to develop a comprehensive vision for leadership education and training at UW-Madison. The Planning Team will help determine how to create a shared leadership framework that includes related competencies and learning outcomes that are based in theory and research.

As an appointed Planning Team Member, Chris is asked to represent the viewpoints of his organization in the area of leadership development and to develop a campus-wide leadership development framework.

If you have any questions relating to this appointment, please contact Mark Kueppers, Assistant Director of Leadership Development in the Center for Leadership and Involvement. He can be reached at (608) 890-2206 or via e-mail at kueppers@studentlife.wisc.edu.

Sincerely,

Lori M. Berquam
Dean of Students

Cc: Chris Carlson-Dakes, College of Engineering
Mark Kueppers, Center for Leadership and Involvement
James Gray, Office of Human Resource Development

Division of Student Life

70 Bascom Hall University of Wisconsin-Madison 500 Lincoln Drive Madison, Wisconsin 53706-1380
608/263-5700 Fax: 608/265-5646 Email: dean@studentlife.wisc.edu http://www.students.wisc.edu

Appendix H – College of Engineering Student Leadership Center Activities

STUDENT LEADERSHIP CENTER FALL 2012 LEADERSHIP PROGRAMMING/WORKSHOPS

TOPIC	GOALS/OBJECTIVES	PRESENTER	AUDIENCE	DATE(s)
SLC New Student Leader Fall Orientation	• Communicate campus and college policy and procedure related to student organizations • Communicate expectations and college values • Discuss disciplinary procedures to ensure we all start the semester on the same page	1. Alicia Hazen, Student Leadership Center Director 2. Steve Cramer, Associate Dean 3. Eve Ferguson, Engineering Student Development Financial Specialist	All registered engineering student organization Presidents and Vice Presidents (required)	Three different days/times, with one scheduled make up session: • Friday, Sept. 7th, 1-2 p.m.: **42** • Monday, Sept. 10th, 1-2 p.m.: **22** • Tuesday, Sept. 11th, 3-4 p.m..: **22** • MAKE UP: Friday, Oct. 5th, 9-10 a.m.: **14** **Total attendees: 100**
SLC Financial Training	• Go over SLC financial policy and procedures related to student org. finances • Train students on how to use the Procard • Communicate expectations for spending and receiving money through UWF and SLC accounts	1. Eve Ferguson, Engineering Student Development Financial Specialist	All registered engineering student organization Treasurers and two additional Designated Purchasing Agents per org. with a UW/SLC account (29 total)	Three different days/times, no make-up sessions: • Friday, Sept. 7th, 3-4 p.m.: **45** • Tuesday, Sept. 11th, 4-5 p.m.: **39** • Wednesday, Sept. 12th, 3-4 p.m.: **22** **Total Attendees: 106**

True Colors: Your Keys to Personal Success	• Address the first "C" of the Social Change Model for Leadership Development: Consciousness of Self. • Help students to become more self-aware about their personal leadership and communication styles	1. Alicia Hazen, SLC Director 2. Kathy Prem, Associate Director of Engineering Career Services	Open to all Engineering Students	Held on Tuesday, November 13th from 5:00-6:30 p.m. in Tong. **Total Attendees: 28**
8 Steps to Conflict Resolution	• Offer students tools to effectively manage and resolve conflict within their student organizations. • Utilize the expertise of a Conflict Resolution specialist on campus who can break it down into eight easy steps students can remember in time of need	1. Harry Webne Behrman, Training Officer, Office of Human Resource Development, http://www.ohrd.wisc.edu/onlinetraining/resolution/index.asp	Open to all engineering students	Held for Tuesday, November 15th from 5:00-6:30 p.m. in Tong Auditorium **Total Attendees: 41**
6 Keys to Creating and Managing Remarkable Projects	• Challenge students to think in new ways about the power and impact of workplace conversations and relationships. • Offer six ideas to be more effective, more productive, and experience less stress, as either a project manager or as an individual project team member.	1. Don Gallagher, Public Speaker http://www.dongallagherllc.com/about/	Open to all engineering students	Held on Thursday, November 29th, from 5:30-6:30 p.m. in 1610 Engineering Hall **Total Attendees: 57**