
AC 2011-1132: RESIDENTIAL PEER MENTORING BENEFITS MENTEES: WHAT ABOUT MENTORS?

Elora Candace Voyles, Southern Illinois University Carbondale

Elora Voyles is a master's student in Workforce Education and Development at Southern Illinois University Carbondale (SIUC). Elora received her B.A. (2010) in psychology at SIUC. Her research interest focuses on: engineering education practices, diversity, and leadership. In pursuing these interests, Elora attained the publication of an article entitled: "The Perception of Leadership Before and After the 2008 Presidential Election" in *The Journal of Psychological Inquiry*. Elora plans to pursue a Ph.D. in psychology following the completion of her master's degree.

Rhonda K Kowalchuk, Southern Illinois University Carbondale

Rhonda Kowalchuk is an Associate Professor of Educational Measurement and Statistics in the Department of Educational Psychology and Special Education at Southern Illinois University Carbondale (SIUC). She received her B.A. (Hons., 1990), M.A. (1993), and Ph.D. (2000) from the University of Manitoba, Canada. She joined SIUC in 2004 and prior to that she worked at the University of Wisconsin - Milwaukee. Her research interest focuses on the performance of statistical procedures when applied to data that do not satisfy the assumptions underlying these procedures. A goal of her research is to provide recommendations to improve the quality of data analyses. Other research related activities involve working as a statistical consultant. She teaches courses in Research Methods, Inferential Statistics, Multiple Regression, Experimental Design, Program Evaluation, and Survey Methods.

John W. Nicklow, Southern Illinois University, Carbondale Robert Ricks

Residential Peer Mentoring Benefits Mentees: What about Mentors?

Abstract

With support from the National Science Foundation (NSF Grant No. DUE 0622483), the College of Engineering (COE) at Southern Illinois University Carbondale (SIUC) has implemented a series of academic and non-academic programs targeting first- and second-year retention rates. Historically the first two years have had the lowest retention rates in the COE. These programs include: (1) an innovative Introduction to Engineering (ENGR 101) course; (2) engineering student designated (ESD) sections for core university and math courses; (3) a six-week Summer Bridge Program for at-risk students; (4) new developmental mathematics courses for underprepared students (ENGR 111A and ENGR 111B); (5) an Engineering Residential College that forms the foundation of a new living-learning community; (6) a multi-tiered student mentoring program that includes faculty mentoring and practicing-engineer (industry) mentoring; (7) peer tutoring; and (8) residential peer mentoring. Although previous research has shown that mentees benefit from mentoring programs, there is a paucity of research on the effect of mentoring on mentors. This paper focuses specifically on connecting the impact of the Residential Peer Mentoring Program to peer mentors.

The COE established several guidelines for the Residential Peer Mentoring Program to help ensure its effective implementation. Peer mentors are expected to live in the residence halls with the students they mentor. Peer mentors are selected from students who have at least one more year in the COE than the students they are supposed to mentor and have demonstrated positive academic performance and leadership potential. Peer mentor duties include: (1) establishing a relationship with new students; (2) encouraging students to attend programs sponsored by the Hall Council or Resident Assistant; (3) taking students to outside activities, such as football games, movies at the Student Center, or any university sponsored program; (4) helping students with studies and leading students at study tables; (5) attending one class per week with new students; (6) taking students who need advice or counseling to the Counseling Center, Wellness Center, etc.; (7) encouraging students to join a Registered Student Organization; (8) continually checking in on students and asking if they are attending class; and (9) supporting the overall mission of University Housing, the College of Engineering, and the university.

In addition to the impact on the target group of students during its first three years of implementation, the Residential Peer Mentoring Program has yielded unintended positive outcomes for residential peer mentors themselves. This paper examines the effects of the Residential Peer Mentoring Program on peer mentors using objective outcome data and student opinion data with an emphasis on addressing the influence of peer mentor duties on peer mentors. Data was collected during the first three academic years during which the Residential Peer Mentoring Program has been operating. Objective outcome data include student retention and GPAs. Student opinion data were elicited through focus groups, survey research and via weekly peer mentor reports.

Introduction

Low retention rates of undergraduate engineering majors, has lead many universities to implement a variety of programs to combat attrition.^{1, 2} Engineering student retention has become critical due to a decrease in graduation rates and a projected need for more engineers in the field.³ The effectiveness of retention initiatives has become a central research topic in engineering education. Peer mentoring models are often utilized in engineering programs to increase retention.

Mentoring describes a relationship between a more experienced and a less experienced individual. Typically the more experienced person, called the mentor, guides the less experienced mentee through a new professional or academic environment.⁴ Mentoring differs from teaching because it is more of a two-way exchange relationship.⁵ The benefits of mentoring models in undergraduate engineering programs have been observed through research.^{6,7,8,9} According to Macintosh, Rushton, and Cook,⁷ benefits to mentees include: Assistance in transitioning into post-secondary education, increased networking and social interaction, improved confidence and motivation, and encouragement from the mentor.

There is a considerable amount of research on the benefits of mentoring on the mentee; however, there is a paucity of empirical research on the benefits of peer mentoring for the mentor in engineering programs. Allen, Lentz, and Day (2006)¹⁰ found that mentors in the workplace experience many benefits from mentoring including: more promotions, higher salaries, and more career success compared to colleagues who are not mentors. Mentoring research in the university setting points to many social benefits,¹¹ as well as improved responsibility in academics for peer mentors.^{10,12} Many articles allude to the benefits of peer mentoring on the mentor in undergraduate engineering programs, but to date only one article has been found that exclusively examines mentors' outcomes (i.e., of the nineteen mentors observed, only 4 (21%) did not persist to graduate in the engineering field).¹³

Undergraduate engineering student graduation rates are reported between 40% and 45%.¹⁴ In a study of about 25,000 freshmen engineering students from different programs, Astin¹⁵ found that only 43% graduated. When the reported 79% retention rates of peer mentors is compared to the retention of general undergraduate engineering majors, the conclusion may be drawn that mentoring is producing positive outcomes for mentors. The effects of mentoring on peer mentors should be further studied because of the small sample size in the aforementioned study. Also, further research is needed to determine which facets of mentoring most positively impact mentors.

Tinto¹⁶ conducted a meta-analysis of retention research and developed a generic college student retention/dropout model. Basically, Tinto's model consists of six stages of the dropout decision. Stage 1 consists of student pre-college characteristics and experiences, including family background, individual attributes, and schooling. Stage 2 involves student commitment to higher education in general and to a specific higher education institution. Stage 3 involves student experiences in the academic and social systems. The academic systems include grades and perceived intellectual development. The social systems include peer-group and faculty interactions. Stage 4, integration, is the result of Stage 3 experiences and is also divided into academic and social integration, respectively. During Stage 5, students revisit their commitments

to higher education and to the academic institution. Based on their new level of commitment, students make a decision to continue or drop out during Stage 6. Stages 3-6 are repeated throughout the student’s tenure in higher education.

Tinto’s model has been examined in different contexts. Because of a “growing need for more engineers”; (p.1)¹⁷ there is a need to significantly improve engineering student retention and graduation rates. Veenstra, Dey, and Herrin (2009)¹⁷ developed a model based on empirical differences between engineering students and students from “general empirical studies.” The initial model predicting “freshman academic success” (measured by first-year GPA) is based primarily on pre-college characteristics such as high school academic achievement, quantitative skills, study habits, confidence, social engagement, and commitment to the institution.¹⁷ Another proposed model predicts retention based on revised commitment to engineering, revised commitment to the institution, and first-year GPA.¹⁸ The model with an emphasis on commitment is of great interest because retention and graduation is the ultimate goal, and universities can implement programs that impact the first-year freshman experience.

The College of Engineering (COE) at Southern Illinois University Carbondale (SIUC) implemented a series of programs focused specifically at impacting the first- and second-year student experiences with the ultimate goal of improving student retention and graduation. The initiatives consist of eight academic and non-academic programs (see Figure 1). This paper focuses specifically on the Residential Peer Mentoring Program.

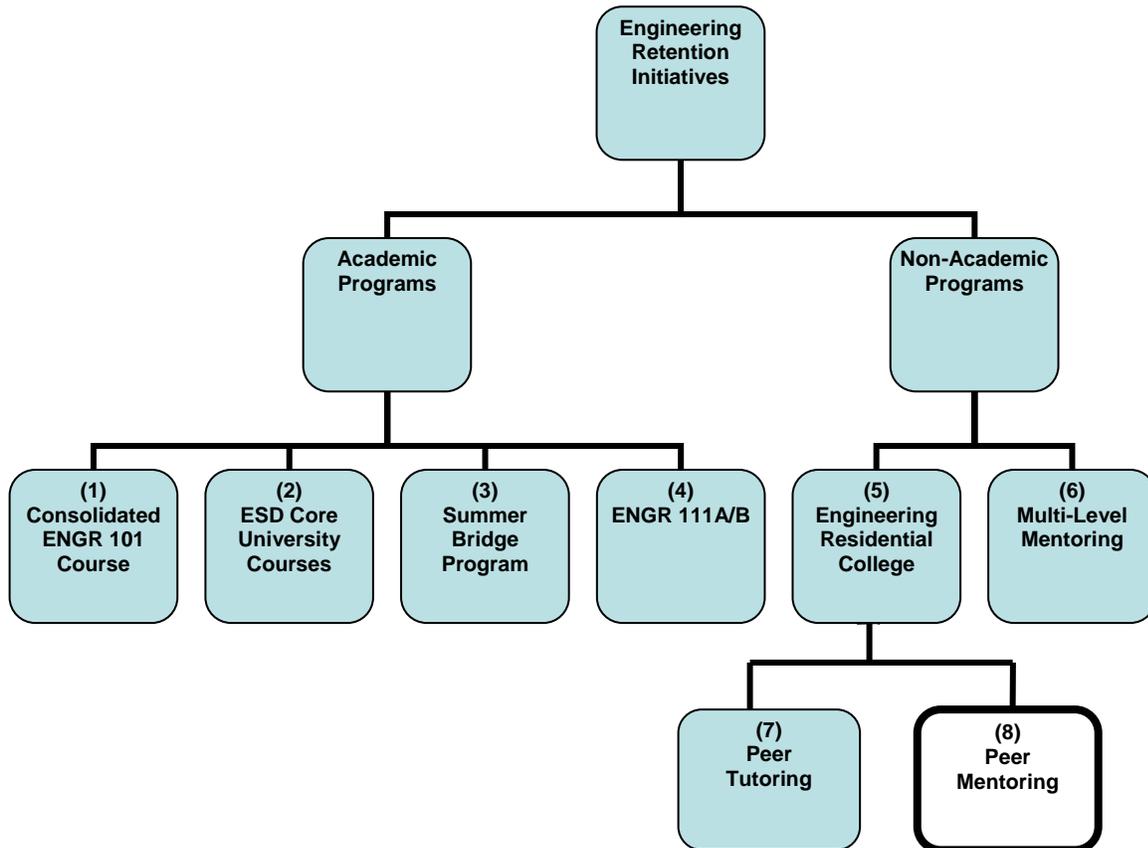


Figure 1. Program structure for engineering student retention initiatives

The Engineering Residential College (ERC) is an integral part of this student retention initiative. All incoming COE freshman students since the fall 2007 semester are required to live in the residence halls for their first two years. Three residence halls are designated for engineering students only (ESD). Of the three engineering designated residence halls, one is co-ed. As a part of the student retention program, the COE hired mentors to live in these ESD residence halls with the freshman and sophomore students. For the first year of the Residential Peer Mentoring Program (2007/2008), the COE hired 29 peer mentors from among the top-performing sophomore, junior, and senior engineering students to live in the ESD residence halls with the freshman cohort. For the second year (2008/2009), the COE hired 42 peer mentors, including 32 from the initial freshman cohort. For the third year (2009/2010), the COE hired 48 peer mentors. For the fourth year (2010/2011), the COE hired 60 mentors, including 14 mentors from previous semesters. The gender, age, and ethnicity of each peer mentor cohort are displayed in Table 1, Table 2, and Table 3, respectively.

Table 1
Peer Mentors' Gender

	Cohort							
	Fall 2007 Mentors		Fall 2008 Mentors		Fall 2009 Mentors		Fall 2010 Mentors	
Gender	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Female	5	17.2%	6	14.3%	7	14.6%	11	18.3%
Male	24	82.8%	33	78.6%	40	83.3%	46	76.7%
Not Available	---	---	3	7.1%	1	2.1%	3	5.0%

Table 2
Peer Mentors' Age

	Cohort			
	Fall 2007 Mentors	Fall 2008 Mentors	Fall 2009 Mentors	Fall 2010 Mentors
<i>n</i>	29	42	48	60
Min	18	18	19	19
Max	25	25	26	22
Mean	20.62	19.85	20.13	19.86
<i>sd</i>	1.47	1.29	1.15	0.96

Note: Min = minimum age, Max = maximum age, *sd* = standard deviation

Table 3
Peer Mentors' Ethnicity

Ethnicity	Cohort			
	Fall 2007 Mentors	Fall 2008 Mentors	Fall 2009 Mentors	Fall 2010 Mentors
American Indian/Alaskan Native	---	---	---	---
Asian/Pacific Islander	---	3 (7.1%)	1 (2.1%)	5 (8.3%)
Black (Not Hispanic)	5 (17.2%)	2 (4.8%)	1 (2.1%)	5 (8.3%)
Hispanic/Latino	---	---	1 (2.1%)	1 (1.7%)
White (Not Hispanic)	24 (82.8%)	34 (80.9%)	44 (91.7%)	45 (75%)
Other	---	---	---	1 (1.7%)
Not Reported/Not Available	---	3 (7.1%)	1 (2.1%)	3 (5.0%)

The mentors received a week of training and a peer mentor handbook for reference prior to the start of the academic year. Mentor duties include the following:

- Establishing a relationship with all new students
- Encouraging students to attend programs sponsored by the hall council or Resident Assistant
- Taking students to outside activities, such as football games, movies at the Student Center, or any university sponsored program
- Helping students with studies and leading students at study table
- Attending one class per week with new students
- Taking students who need advice or counseling to the Counseling Center, Wellness Center, etc.
- Encouraging students to join a Registered Student Organization
- Continually checking in on students and asking if they are attending class
- Supporting the overall mission of University Housing, the College of Engineering, and the university.

Many of these mentor duties are beneficial to the mentee, but are likely beneficial to the mentor due to the two-way relationship in peer mentoring: (1) establishing a relationship with all new students (social integration); (2) encouraging students to attend programs sponsored by the hall council or Resident Assistant (social integration); (3) taking students to outside activities, such as football games, movies at the Student Center, or any university sponsored program (social integration); (4) helping students with studies and leading students at study table (academic integration); (5) attending one class per week with new students (academic integration); (6) encouraging students to join a Registered Student Organization (social integration); and (7) continually checking in on students and asking if they are attending class (academic integration). This paper focuses specifically on connecting the impact of the Residential Peer Mentoring Program to peer mentors.

Methodology

The evaluation used a single-group design because no comparison group was available. The evaluation team and COE staff collected formative evaluation data for each component of the Residential Peer Mentoring Program during the first three years of implementation. This paper examines each component of the mentoring program using combinations of the following: (1) peer mentor qualitative data; (2) quantitative survey data; and (3) objective outcome data. The Residential Peer Mentoring Program guidelines and duties were used to develop the evaluation plan and tools. Peer mentor opinion data were elicited during the spring 2008, 2009, and 2010 using survey data and peer mentor focus group data from the spring 2010 semester. Objective outcome data include mentor retention rates and cumulative GPA.

To address content validity for the survey instruments, the evaluation team developed all surveys in house to address specific program objectives. A panel of experts reviewed the items for content, clarity, and consistency. The evaluation team revised the initial version of the instrument based on results from the spring 2008 semester.

Peer mentor opinion data included both survey and focus group data. The survey data included quantitative data (e.g., Likert-type items) and qualitative data (e.g., open-ended questions). The

survey contained a total of 59 items to assess aspects of the Residential Peer Mentoring Program. Of those items, 38 assessed the nature and frequency of peer mentor interaction with students. Mentors (n = 4) were asked to discuss specific topics about the impact of the Residential Peer Mentoring Program in a focus group (spring 2010). Additionally, mentor comments and logs helped clarify the impact of the program on mentors.

The peer mentors are collocated in the engineering student designated (ESD) residence halls, which were established as a living-learning community (LLC). A limitation to evaluating the effectiveness of the Residential Peer Mentoring Program is that it is difficult to separate the impact of the residential peer mentors from the actual LLC experience.

Results

Using various combinations of data sources, the results are divided into general observations, peer mentor training and supervision, an evaluation of the benefits of the mentoring program on academic and social impacts on peer mentors, and objective outcome data.

General Observations

Overall, 24 out of 29 mentors responded to the Peer Mentor Survey during the spring 2008 semester, 32 out of 42 during the spring 2009 semester, and 34 out of 48 during the spring 2010 semester (response rates of 83%, 76%, and 71%, respectively). Although the majority of mentors (n = 73) served for 2 semesters, some mentors (n = 4) served up to 5 semesters. On average, peer mentors worked with about 11 mentees. Considering the approximate 10 hour work week for peer mentors, there may have been limited time to meet with mentees individually. One hour of each week was dedicated to attending a class with mentees.

A sample of peer mentor logs demonstrated an even division of time dedicated to academics and social activities with mentees. The academic activities centered on advising mentees, helping mentees with homework, and talking with mentees to monitor how their classes are progressing. Social activities included: talking about mentees' concerns, eating meals together in the dining hall, and attending or participating in sports activities.

Peer Mentor Training and Supervision

Several items in the survey addressed aspects of the peer mentor training and supervision. Table 4 summarizes the responses from items which addressed the perceived levels of emphasis placed on various aspects of mentor training. The following are noteworthy:

- More than 60% of the mentors indicated that about the right level of emphasis was placed on all aspects of their training
- 22% of mentors indicated that not enough emphasis was placed on phases of the mentoring relationship
- 20% of mentors indicated that not enough emphasis was placed on forming study groups

Table 4
Mentors' Opinions on Training

Aspect of Training	Level of Emphasis			
	Too much	About right	Not enough	No Response
Skills and qualities for mentoring	5 (5.6%)	74 (82.2%)	7 (7.8%)	4 (4.4%)
Duties and responsibilities of mentoring	3 (3.3%)	74 (82.2%)	9 (10.0%)	4 (4.4%)
Phases of the mentoring relationship	8 (8.9%)	58 (64.4%)	20 (22.2%)	4 (4.4%)
Time management skills	9 (10.0%)	67 (74.4%)	9 (10.0%)	5 (5.6%)
Communication and listening skills	3 (3.3%)	73 (81.1%)	10 (11.1%)	4 (4.4%)
Confidentiality and ethical considerations	11 (12.2%)	68 (75.6%)	7 (7.8%)	4 (4.4%)
Transition/adjustment issues for new students.....	3 (3.3%)	70 (77.8%)	13 (14.4%)	4 (4.4%)
Forming study groups	5 (5.6%)	62 (68.9%)	18 (20%)	5 (5.6%)
Recording student contact on time sheet.....	5 (5.6%)	66 (73.3%)	15 (16.7%)	4 (4.4%)

Note: n = 90; “Thinking back to the training session and relating it to your actual mentoring experiences, please indicate whether you feel the emphasis placed on each area was appropriate.”

Peer mentors were asked an open-ended question about other aspects of training that should be included. The following exemplify peer mentors’ responses:

- “I feel that everything was covered fairly well. The thing about being a peer mentor is that no matter how one prepares the best way to figure out how to be a good one is just practice through experience.”
- “Much more time should be spent on how to talk to and encourage those who don’t want to be social or spend much time out of their room.”
- “I believe the training sufficiently trained me for most of the experience that I felt undertrained for was how to deal with a student who just not motivated, no matter how much effort you put forth.”
- “No, I think the majority of qualities needed as a peer mentor can not be trained, but must be learned through experience.”

Mentors were also asked about the level of support they received from their supervisor in the Associate Dean’s office of the COE. Eighty-four percent of mentors indicated that the level of support was either “good” or “excellent”. Mentor open-ended responses included:

- “Anything that we need, the Dean's office gets it to us immediately. No matter if it is chairs and tables in the hallways, a question, or a personal favor, they respond immediately and help us out in any way possible.”
- “Any problems that I noted, or any comments/notes that I added in my report were responded to and I got an email each time, to let me know about what actions were being taken to correct any problems, and what to do for future reference.”

Academic Impacts

The impact of peer mentoring on academic integration was measured based on several general indicators and three of the mentors’ primary responsibilities: (1) helping students with studies

and leading students at a study table; (2) attending one class per week with new students; and (3) continually checking in on students and asking if they are attending class.

Six Likert-type items addressed general areas where peer mentoring could impact the academic integration of mentors (see Table 5). Overall, there was very little difference in the pattern of responses to these items across the 2007/2008, 2008/2009, and 2009/2010 cohorts of mentors. Thus, data across the 3 years was aggregated. The following are noteworthy:

- 98% of mentors agreed that they were able to help their mentees with their course work
- 95% of mentors agreed that they were able to answer mentee questions about academics
- 87% of mentors agreed that they set a positive example to mentees with their study habits
- 65% of mentors agreed that they regularly assessed mentees' learning outcomes

Table 5
General Academic Integration Likert Items

Item			Percent of Responses (n = 90)					
	M	sd	SA	A	N	D	SD	NR
I was able to help my mentees with their course work	4.51	0.55	53.3	44.4	2.2	0.0	0.0	0.0
I was able to answer mentee questions about academics	4.51	0.57	54.4	41.1	3.3	0.0	0.0	1.1
I was able to assist mentees to set up academic support networks	4.01	0.63	20.0	60.0	18.9	0.0	0.0	1.1
I provided a positive example to my mentees with my study habits	4.20	0.75	36.7	50.0	10.0	3.3	0.0	0.0
I regularly assessed my mentees' learning outcomes	3.73	0.83	16.7	47.8	27.8	7.8	0.0	0.0
I was able to help my mentees manage their time effectively	3.91	0.65	14.4	64.4	18.9	2.2	0.0	0.0

Note: Items were rated on a 5-point scale from strongly disagree (1) to strongly agree (5)
M is the arithmetic mean, *sd* is the standard deviation
 SA = Strongly Agree, A = Agree, N = Neutral, D = Disagree, SD = Strongly Disagree, NR = No Response/Missing

Mean responses ranged from 3.73 to 4.51, indicating moderate to strong agreement on academic integration items (see Table 5). Based on the range of standard deviations, respondents disagreed with each other most on how often they assessed mentees learning outcomes (*sd* = 0.83). Much of the mentors' time with mentees was focused on academics. For example, 96% of mentors indicated on another survey item that they provided "a great deal" of academic advice or course related support to their mentees.

Peer mentors were asked about the benefits of peer mentoring. Responses that related to academics included:

- "It keeps me fresh on some of my classes that I took a while ago. It also helps me learn how to teach others and to try and be patient with their learning."
- "It also helps me academically by allowing me the opportunity to tutor students in subjects that I have taken in the past, which helps me to learn the concepts more."
- "I think it has helped me in being a better student because I have to set an example for mentees."

- “This is the great opportunity to challenge myself that how much I know the course material.”
- “It has helped me with school work because instead of always studying alone, I often work in groups with my mentees.”
- “The possible impact we could have on the students. I haven't seen the numbers but I hope we made a difference.”

Mentors were instructed to lead study groups to assist mentees with academics. Table 6 displays the frequency of mentor-lead study groups reported by mentors. Across the three cohorts, 73% of mentors reported leading study groups with mentees at least once a week with the most common response of “2-3 times each week”.

Table 6
Study Groups with Mentees

Response Options	Cohort		
	2007/2008	2008/2009	2009/2010
4 or more times each week	6 (25.0%)	2 (6.3%)	1 (2.9%)
2-3 times each week	10 (41.7%)	19 (59.4%)	13 (38.2%)
Once each week	3 (12.5%)	4 (12.5%)	8 (23.5%)
2-3 times each month	4 (16.7%)	4 (12.5%)	5 (14.7%)
Once each month	---	1 (3.1%)	4 (11.8%)
2-3 times this semester	---	2 (6.3%)	2 (5.9%)
Once this semester	1 (4.2%)	---	---
Never	---	---	1 (2.9%)
No Response	---	---	---

Note: “How often did you form a mentor-led study group with students?”

Table 7 displays a summary of mentor responses related to the frequency of attending class with their mentees. It is noteworthy that the majority of mentors (86%) from the 2008/2009 and 2009/2010 cohorts attended class with mentees at least once a week. This represents a dramatic increase in class attendance with mentees from the 2007/2008 cohort that is most likely due to a personnel and policy change.

Table 7
Class Attendance with Mentees

Response Options	Cohort		
	2007/2008	2008/2009	2009/2010
Once each week	8 (33.3%)	27 (84.4%)	30 (88.2%)
2-3 times each month	3 (12.5%)	4 (12.5%)	3 (8.8%)
Once each month	2 (8.3%)	1 (3.1%)	---
2-3 times this semester	6 (25.0%)	---	---
Once this semester	4 (16.7%)	---	---
Never	---	---	1 (2.9%)
No Response	1 (4.2%)	---	---

Note: “How often did you attend class with the students you mentored?”

Peer mentors were asked what they least liked about mentoring and “attending class with mentees” was a common response.

- “The going to one class per week. It's a good idea, but I usually have to get out early from a class/mess with my schedule since I have classes at the same times as the freshmen.”
- “Having to take time out of my day to go to a mentee's class.”
- “I do not think it should be required to go to a freshman class every week because with the mentor's schedules sometime they can't fit in a freshman class”
- “I felt kind of awkward attending classes other than engineering 101.”

Mentors were also expected to continually check in on students and ask if they are attending class. All but one respondent indicated that they performed this duty at least occasionally with 58% of mentors checking in on their mentees frequently (see Table 8).

Table 8
Checking Mentee's Class Attendance

Response Options	Cohort		
	2007/2008	2008/2009	2009/2010
Frequently	11 (45.8%)	23 (71.9%)	18 (52.9%)
Occasionally	12 (50.0%)	9 (28.1%)	16 (47.1%)
Not at All	1 (4.2%)	---	---

Note: “How often did you check in on students to ensure they were attending class?”

Social Impacts

The impact of peer mentoring on social integration was measured based on four of the mentors’ primary responsibilities: (1) establishing a relationship with all new students; (2) encouraging students to attend programs sponsored by the hall council or Resident Assistant; (3) taking students to outside activities, such as football games, movies at the Student Center, or any university sponsored program; and (4) encouraging students to join a Registered Student Organization (RSO).

Peer mentors’ mean responses to social integration questions ranged from 3.97 to 4.57, indicating moderate to strong agreement (see Table 9). Based on standard deviations, mentors least agreed with each other on whether they were able to assist mentees to set up social support networks with a mean of 3.97 ($sd = 0.76$). The following are noteworthy:

- 98% of mentors agreed that they were able to establish positive relationships with their mentees
- 94% of mentors agreed that their mentees trusted them enough to share personal thoughts and feelings
- 76% of mentors agreed that they were able to assist mentees in setting up social support networks

Table 9
General Social Integration Likert Items

Item	<i>M</i>	<i>sd</i>	Percent of Responses (<i>n</i> = 90)					
			SA	A	N	D	SD	NR
I was able to establish positive relationships with my mentees	4.57	0.54	58.9	38.9	2.2	0.0	0.0	0.0
I was able to communicate effectively with my mentees	4.46	0.52	46.7	51.1	1.1	0.0	0.0	0.0
I was able to assist mentees to set up social support networks	3.97	0.76	23.3	52.2	20.0	3.3	0.0	1.1
My mentor-mentee relationships were a good fit	4.37	0.63	44.4	47.8	7.8	0.0	0.0	0.0
I was able to build a relationship of mutual respect with each of my mentees	4.40	0.56	43.3	53.3	3.3	0.0	0.0	0.0
My mentees trusted me enough to share their personal thoughts and feelings	4.38	0.63	44.4	50.0	4.4	1.1	0.0	0.0
I adjusted my approach to working with each mentee as our relationship developed throughout the semester	4.20	0.58	28.9	62.2	8.9	0.0	0.0	0.0

Note: Items were rated on a 5-point scale from strongly disagree (1) to strongly agree (5)
M is the arithmetic mean, *sd* is the standard deviation
 SA = Strongly Agree, A = Agree, N = Neutral, D = Disagree, SD = Strongly Disagree, NR = No Response/Missing

Other survey items also provide indicators of impacting social integration through establishing a relationship with the new students. For example, 84% of respondents indicated that living in the residence hall was a necessary component of their mentoring role. Furthermore, 76% of mentors reported sharing ‘a great deal’ of personal experiences with their mentees.

An item also provided a measure of whether mentors encouraged students to attend programs sponsored by the hall council or Resident Assistant. Eighty-six percent of respondents indicated that they encouraged students to attend residence hall activities such as sports, movie night, and floor meetings.

Additional items related to how often the mentors took students to outside activities, such as football games, movies at the Student Center, or any university sponsored program. Mentors identified which of six activities or places outside the residence hall they attended with their mentees. The three most common activities or places were: (1) attend SIUC athletic event; (2) [go to] student recreation center; and (3) have dinner off campus.

Furthermore, an item asked whether mentors encouraged mentees to join RSOs. Eighty-six percent of peer mentors reported encouraging mentees to join student organizations.

One of the main benefits of peer mentoring that mentors commented on was increased social integration. Mentor responses included:

- “Helping out new students which eventually turns into a friendship.”
- “Getting to meet new students and interact and create a relationship was the best part about the whole situation.”

- “What I loved most about the peer mentoring program is it is a mutual benefit. I help new students adjust to university life and they teach me interpersonal skills and take me back to my fundamental courses.”
- “I believe it positively affects students by showing them there are people who will support them, whether through personal or academic issues. It shows the college of engineering takes an active interest in the well-being of their students.”
- “I think it's helped a lot of the mentees get more involved and adjust to college better. I know for me, the first week as a freshman I would have sat in my room if it hadn't been for the mentors inviting me to card games and other activities.”
- “I definitely would say it allowed me to make several new friends, and network academically and socially especially with people that can help me in the future.”

Objective Outcome Data

Mentors' classification status was obtained from the COE to track academic progress and retention. Table 10 presents the mentors' status when hired and their current status as of the fall 2010 semester. The 95% retention rate of peer mentors is particularly noteworthy compared to national rates for undergraduate retention. Peer mentoring seems to encourage higher retention for mentors through increased academic and social integration. This unusually high retention rate is also likely influenced by alternative factors: the peer mentor application process is very selective and the effects of the other COE retention initiatives cannot be separated from the effects of peer mentoring.

Table 10

Peer Mentors' Classification Status

Status	Cohort					
	2007/2008		2008/2009		2009/2010	
	Hired	Fall 2010	Hired	Fall 2010	Hired	Fall 2010
Freshman	1 (3.4%)	---	---	--	---	---
Sophomore	11 (37.9%)	---	32 (76.2%)	---	41 (85.4%)	1 (2.0%)
Junior	10 (34.5%)	---	6 (14.3%)	2 (4.8%)	6 (12.5%)	34 (70.8%)
Senior	7 (24.1%)	8 (27.6%)	4 (9.5%)	29 (69.0%)	1 (2.0%)	11 (22.9%)
Graduated	---	18 (62.1%)	---	9 (21.4%)	---	1 (2.0%)
Changed Major	---	2 (6.9%)	---	2 (4.8%)	---	1 (2.0%)
Dropped Out	---	1 (3.4%)	--	---	---	---
Total	29	29	42	42	48	48

On an open-ended response question, mentors commented on the effects of peer mentoring on retention:

- “To be completely honest if it was not for being a mentee my freshmen year, and a mentor my sophomore year I would have been challenged to stay in the program.”
- “Kept more people in engineering. Improved over all grades / understanding / GPA for all students.”

- “To a slight degree, it help[s] freshmen succeed and stay in engineering. I've also noticed that I can't think of a single mentor who has not continued in engineering.”

Peer mentors' cumulative grade point averages (GPAs) at the end of the fall 2010 semester were obtained through the COE to examine academic performance by classification status (see Table 11). It is worth noting that students serving as mentors were able to maintain an average cumulative GPA above 3.0.

Table 11
Peer Mentors' Cumulative Grade Point Average

Fall 2010 Status	Cohort					
	2007/2008		2008/2009		2009/2010	
	n ^a	Mean (sd)	n ^a	Mean (sd)	n ^a	Mean (sd)
Freshman	---	---	---	---	---	---
Sophomore	---	---	---	--	1	*
Junior	---	---	2	*	34	3.16 (0.43)
Senior	8	3.05 (0.62)	29	3.35 (0.42)	11	3.02 (0.39)
Graduated	18	3.44 (0.58)	9	3.34 (0.64)	1	*
Changed Major	2	*	2	*	1	*
Dropped Out	1	*	---	---	---	---

Note: ^a frequency count of classification status as of fall 2010 semester; *sd* is standard deviation;
*Data withheld for confidentiality due to small sample size.

Conclusions and Recommendations

The Residential Peer Mentoring Program in the COE at SIUC has shown several benefits during its first three years of implementation. Particularly noteworthy is that the mentors overwhelmingly agreed that that living in the residence halls with their mentees helped them to be effective. Mentors consistently reported positively on all aspects related to academic and social integration. For example, most mentors noted that they improved their understanding of the basic courses and improved their social skills as a result of their role as a mentor.

Training week was viewed as helpful to prepare the mentors and regular supervision was viewed as supportive when dealing with any challenges related to their mentoring duties. More than 60% of the mentors indicated that the different aspects covered during training received the right amount of emphasis. Mentors also commented favorably on the availability and responsiveness of the supervisor in the Associate Dean's office in the COE.

Mentors experienced benefits with regards to academic integration due to their involvement in the mentoring program. Mentors indicated that they spent a great deal of time on academics with mentees. Specifically, mentors reported assessing mentees' learning outcomes, attending class with mentees, and holding study groups. Although the effects of other retention initiatives implemented by the COE cannot be separated from the influence of peer mentoring, peer mentors maintained an average cumulative GPA above 3.0 and have an impressive retention rate (i.e., 95%).

The positive social impacts of the mentoring program are evident through the open-ended responses and social integration Likert items. Almost all mentors were able to establish positive

relationships with their mentees. Open-ended responses attested to the social benefits of peer mentoring with the majority of peer mentors mentioning new social connections and friendships as one of the benefits of being a peer mentor.

A properly implemented Residential Peer Mentoring Program is an initiative that can affect a large number of students at a traditional university. Proper implementation involves establishing specific goals and objectives for the program, providing appropriate training and support for the mentors, establishing guidelines and supervision for the program, and continually evaluating the impact of the program based on the program's goals and objectives. Under the above-specified circumstances, the Residential Peer Mentoring Program at SIUC has had many positive impacts on mentors; most notably on the retention of peer mentors.

Acknowledgement

This material is based upon work supported by the National Science Foundation under Grant No. DUE 0622483.

Bibliography

-
- ¹ Carlson, L.E., and J.F. Sullivan. 1999. Hands-on Engineering: Learning by doing in the integrated teaching and learning program. *International Journal of Engineering Education* 15(1): 20-31.
- ² J.D. McCowan. 2002. An integrated and comprehensive approach to engineering curricula, Part two: Techniques. *International Journal of Engineering Education* 18(6): 638-643.
- ³ Board of Engineering Education-National Research Council. 1992. Improving retention in undergraduate engineering education. *Issues in Engineering Education: A Bulletin Addressing Culture Change in Engineering Education* 1 (1).
- ⁴ Donaldson, S.I., E.A. Ensher, and E.J. Grant-Vallone. 2000. Longitudinal examination of mentoring relationships on organizational commitment and citizenship behavior. *Journal of Career Development* 26(4): 233-249.
- ⁵ Pisimisi, S. and M. Loannides. 2005. Developing mentoring relationships to support the careers of women in electrical engineering and computer technologies. An analysis on mentors' competencies. *European Journal of Engineering Education*, 30(4): 477-486.
- ⁶ Moxley, D., A. Najor-Durack, and C. Dunbrigue. 2001. *Keeping students in higher education: Successful practices & strategies for retention*. London: Kogan Page Limited.
- ⁷ Macintosh, K.A., B.S. Rushton, and A. Cook, eds. 2006. *Students supporting students: Student mentoring*. University of Ulster, Coleraine, Northern Ireland.
- ⁸ Terrion, J. Lennox and D. Leonard. 2010. Motivation of paid peer mentors and unpaid peer helpers in higher education. *International Journal of Evidence Based Coaching and Mentoring* 8(1): 85-103.
- ⁹ Ricks, R., R. Kowalchuk, J. Nicklow, L. Graceson-Martin, L. Gupta, J. Mathias, J. Tezcan, and K. Pericak-Spector. 2009. Evaluation of a new engineering residential college initiative. *Proceedings of the 2009 American Society for Engineering Education Conference*. Austin, TX.
- ¹⁰ Allen, T.D., E. Lentz, and R. Day. 2006. Career success outcomes associated with mentoring others: A comparison of mentors and nonmentors. *Journal of Career Development* 32(3): 272-285.
- ¹¹ Terrion, J. Lennox, R. Philion, and D. Leonard. 2007. An evaluation of a university peer-mentoring training programme. *International Journal of Evidence Based Coaching and Mentoring* 5(1): 19-29.
- ¹² Dye, B., S. Pinnegar and K. Robinson. 2005. Peer mentors tell their stories of learning: A narrative study. *Proceedings of the 24th Annual Conference on the First Year Experience*, Phoenix, AZ.
- ¹³ Good, J.M., G. Halpin, and G. Halpin. 2000. A promising prospect for minority retention: Students becoming peer mentors. *Journal of Negro Educators* 69(4): 375-83.
- ¹⁴ Moller-Wong, C. and A. Eide. 1997. An Engineering Student Retention Study. *Journal of Engineering Education* 86(1): 7-15.

-
- ¹⁵ Astin, A.W. 1993. The climate for undergraduate engineering education: Results from a recent national study. *Proceedings of the Annual Engineering Dean's Institute*. New Orleans, LA.
- ¹⁶ Tinto, V. 1975. Dropout from higher education: A theoretical synthesis of recent research. *Review of Educational Research* 45(1): 89-125.
- ¹⁷ Veenstra, C.P., E.L. Dey, and G.D. Herrin. 2009. A model for freshman engineering retention. *Advances in Engineering Education* 1(3): 1-33.
- ¹⁸ Veenstra, C.P., E.L. Dey, and G.D. Herrin. 2008. Is modeling of freshman engineering success different from modeling of non-engineering success? *Journal of Engineering Education* 97(4): 467-479.