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## **AC 2012-3993: PROMOTING STUDENT CONNECTIONS AND RETENTION THROUGH AN ON-CAMPUS RESIDENTIAL LEARNING COMMUNITY FOR FIRST-YEAR UNDERREPRESENTED AND LOW-INCOME STUDENTS**

**Dr. Jess W. Everett, Rowan University**

Dr. Everett is a Professor of Civil and Environmental Engineering. He is interested in sustainable engineering and education innovation.

**Dr. Patricia Dee Zobel, Rowan University**

## **Student Connections and Retention through an On-Campus Residential Learning Community for First-Year Underrepresented and Lo-Income Students**

### **Introduction**

The College of Engineering at Rowan University, a four-year, mid-sized, suburban, public university in the North East, is in the fourth year of a six year NSF S-STEM grant (Scholarships for Science, Technology, Engineering and Math). In addition to providing two cohorts of students with four year \$3,000 dollar annual scholarships, students are provided targeted mentoring, participate in an Engineering Learning Community (ELC) in the first year, and are provided with tutoring-on-demand for core engineering courses throughout the four-year degree program.

Only students with financial need were accepted into the S-STEM scholarship program and ELC. Students from under-represented groups in Engineering were aggressively recruited, i.e., women, African-Americans, Hispanic-Americans, and Native Americans. The first student cohort of 22 students was admitted in Fall 2009, with 50% belonging to under-represented groups in STEM. The second cohort of 22 students was admitted in Fall 2010. Sixty-four percent of the students belonged to under-represented groups. All S-STEM scholars participated in the ELC.

A number of components were included in the ELC to encourage student-faculty and student-student relationships and help students form support groups to improve the academic and social transition to college. Students were housed together in a common freshman dorm and enrolled in the same sections of Composition I, Freshman Engineering Clinic I and II, and Calculus II (first cohort) or Physics I (second cohort). Freshman Engineering Clinic I & II introduced students to Engineering and important college skills.

Extracurricular activities for the two cohorts were used to forge student-student and student faculty bonds and promote academic success. Extracurricular activities over the first two years included: “get to know each other” socials; sessions on study skills, alcohol awareness, interviewing for jobs, Excel, and graphing calculators; cultural and social activities on campus; meetings with juniors and seniors to learn about upper level student projects; and a meet-and-greet with engineering alumni.

Creating more and stronger bonds with peers, faculty, and the campus provides students with access to resources that help them study, complete homework, and obtain useful information about their campus. This should provide students with an easier and more successful transition to college, resulting in improved retention. The purpose of this paper is to present results pertaining to the effectiveness of the ELC. Though the current NSF S-STEM grant does not provide scholarships to a third cohort, the positive results of the first two ELC-cohorts were such that it has been continued, without scholarships, for students entering in Fall 2011.

## Background

The modern day living and learning community (LLC) concept serves a population of motivated students who learn by collaborating with faculty and other students. The Engineering Learning Community (ELC) that is the focus of this paper is an LLC. Living and learning communities are designed to increase student satisfaction and learning in order to create and sustain student success.<sup>1,2</sup> Learning communities use a constructivist approach to learning. This means that knowledge is not discovered; rather, it is socially constructed.<sup>3</sup> Living and learning communities assist in developing supportive peer relationships.<sup>4,5,6,7</sup> Many studies on LLCs confirm that students who participate in living and learning communities have an enhanced academic experience through intentionally shared experiences.<sup>8,9</sup> LLCs are characterized by the close working relationships among students and faculty; specialized course assignments; study groups; close relationships among student members; and specialized events, activities, and workshops.<sup>5,6,10</sup> According to Schroeder et al., learning communities substantially enhance academic achievement, retention, and educational attainment, especially for freshmen.<sup>13</sup>

Most LLCs are communities in which students pursue their academic curriculum with a blended co-curriculum involving a theme, concept, or common subject matter while living together in a reserved part of a residence hall.<sup>14</sup> LLCs range in size but rarely exceed 75 participants.<sup>10</sup> The small size of LLCs assists in developing supportive peer relationships.<sup>4</sup>

LLCs are characterized by close working relationships among students and faculty; specialized course assignments; study groups; close relationships among student members; and specialized events, activities, and workshops.<sup>5,6,10</sup> Students are tightly connected through their enrollment in specific sections of courses that act as supportive scaffolding to these highly interactive and close knit communities of students and faculty.<sup>11</sup>

Retention and student housing may appear to be separate issues, however the implementation of LLCs at various institutions has resulted in a significant increase in retention and demand for on-campus student housing.<sup>20</sup> Although LLCs may not seem like a likely solution to retention problems, these communities help retain students at a very high rate.<sup>20</sup> Nationally, 32% of all first-year college students entering public colleges and universities drop out before their sophomore year.<sup>21</sup> Additionally, another 22% are likely to drop out of school before completing their degrees.<sup>21</sup> Some LLCs are created exclusively for the purpose of curbing low retention rates. According to LaVine and Mitchell, LLCs increase retention by generating an encouraging and success-oriented learning environment.<sup>22</sup> LLCs are outcome focused programs with a goal to create and build collaborative relationships, sustain an environment which fosters a high level of critical thinking, and increase individual intellectual and social growth.<sup>2,19,22</sup> The retention rates for LLC students is higher than non-LLC students primarily because of innovative approaches to learning, strong academic support services, increased interaction with instructors, and intense peer support systems that are established amongst students within the communities.<sup>6,22</sup>

Most LLCs have the intended goal of making a large campus feel small.<sup>23,24</sup> Living and learning communities are mainly characterized by their smaller size, their social intensity, and the purposeful support provided to the students who participate in these communities.<sup>4</sup> LLCs have

the ability to transform large, impersonal institutions in which students may feel like just a number into small intimate peer groups within the residence halls.<sup>5</sup>

## Methods

A mixed media approach was used in the study presented here.<sup>25</sup> Focus groups were conducted once for each cohort, following standard methods.<sup>25</sup> The first focus group, with the 2009-2010 ELC community (first cohort), took place in April 2010. The second focus group, with the 2010-2011 ELC community (second cohort), was in December 2010. Surveys were used at the beginning, middle, and end of the freshman year of each cohort. Some surveys were also administered to the general engineering population, allowing for comparison of ELC and non-ELC students. Finally, the retention of the first two cohorts from freshman to sophomore year was examined.

## Results

Results were obtained from focus groups, surveys, and the analysis of retention data.

*Focus Groups:* Focus groups were conducted with the first and second ELC cohorts. Each focus group discussion was transcribed and evaluated for emerging themes following standard methods.<sup>25</sup> The objective of the focus group exercise was to explore students' thoughts, opinions, and levels of satisfaction concerning the ELC program. A list of relevant student comments obtained during the two focus groups sessions is given in the Appendix.

The findings of the focus group discussions are detailed below. After the qualitative data was transcribed, analyzed, and coded several emergent themes were uncovered. Students from both the pilot ELC cohort in 2009-2010 and the subsequent ELC cohort in the 2010-2011 academic year reported similar results. A majority of students in both cohorts reported that their involvement in the ELC program helped eased their transition from high school to college, establish and maintain peer-to-faculty and peer-to-peer relationships, and increase their connection to campus. While satisfied overall, the students identified areas that could be improved.

In April 2010 the first of two focus groups was conducted. The findings from the focus group indicated that students' involvement in the ELC helped ease their transition from high school to college. Similar to the survey findings, the qualitative data gathered from the focus groups indicated the academic resources provided through the community, such as the ELC tutors, helped the students with their coursework and ultimately aided in their retention. The focus group results indicated that students enjoyed the linked courses with familiar peers, which also helped their transition from high school to college. Lastly, the students indicated that the ELC helped them build relationships with other ELC members, which helped them adjust to college socially.

Regarding the ELC academic and social programming, the focus group results indicated that students felt connected to the college campus. The ELC programs, events, and meetings encouraged students to become active members of the collegiate community. Thus the students

were able to gain a sense of belonging to both the ELC and the college community. Participating in the ELC helped students build and maintain close relationships with peers and faculty. Students pointed to living near each other as an important factor in developing peer relationships. They were neighbors, friends, and peers all connected through the engineering major.

ELC student took two ELC-linked courses each semester. They attended class, worked on laboratories and homework, and studied together. These in and out of class peer collaborations helped to foster, build, and maintain close friendships amongst the ELC community members. The social programming that was implemented for the ELC community throughout the year also helped to spark and sustain friendships within the community. Students in the focus group indicated this helped build their peer-to-peer relationships, perseverance to stay in the major, and connection to campus.

The interaction with faculty outside of the classroom was critical in building the peer-to-faculty relationships. Focus group students felt more comfortable approaching their ELC professors because they interacted with these professors outside of the classroom at ELC events and meetings.

The first cohort focus group identified a number of improvement opportunities. First, the participants criticized the lack of consistent group meeting times. Meetings were scheduled around students' schedules, occurring at different times and on various days of the week. It was impossible to find a time when all students could meet. Second, there was a clear consensus that the ELC participants wanted more social programming. Third, some of the focus group participants felt that a residence hall with better study space would help them academically. The ELC dorm had common space, but not study rooms. Finally, many of the participants noted their desire to live with non-engineering roommates and suitemates as well as ELC members.

One of the most important changes implemented in the redesign for the second ELC cohort was enrolling the ELC students in a zero-credit seminar, ensuring a common meeting time. All events were scheduled during the zero-credit seminar once a week meeting time. More events were scheduled, including more social events. The main objective was to get the students engaged and involved in activities outside the classroom. The data from the first cohort indicated participants were unsure of exactly what steps to take to become involved in activities with their peers or on-campus. Students in the second cohort were introduced to the available options in an early ELC seminar meeting. Activities outside of the classroom can contribute to each participant's academic performance and overall satisfaction with their collegiate experience. It was ultimately decided to keep the ELC in the same dorm, because dorms with study rooms were not located near the center of campus. Subsequent cohorts were placed with a mix of engineering and non-engineering roommates, while continuing to live along a common hallway.

More social programming was scheduled for the second cohort. New programming was introduced to assist students in forming stronger peer-to-peer relationships, a linchpin of student success and overall satisfaction with college.<sup>2,26</sup> It was hoped that the hybrid of academic, social, and school-spirited activities would strike the appropriate balance to address each participant's needs. The extracurricular activities offered to the first two cohorts are described in Table 1.

Table 1: ELC Extra Curricular Activities

Session Topic	First Cohort	Second Cohort
Meet and greet faculty and students	X	X
Academic Success	X	X
Jr-Sr Student Project Teams (2 meetings)	X	
Graphing calculators	X	
Campus Opportunities	X	X
Alumni Meet and Greet	X	
Volleyball Game		X
Excel Workshop		X
Alcohol Awareness Program		X
What Not to Wear... To an Interview		X
Interview Practice		X
Healthy Snacking		X
Mask Making		X
Whiffle Ball Game		X
Ice Cream Social		X

A second focus group was completed (second cohort) in December 2010 to assess the students' thoughts, feelings and perceptions concerning the impact the ELC had on the students' overall experiences in Fall 2010. The data collected and analyzed were used to identify recommendations for the redesign and recalibration of the ELC program for the spring 2011 semester and for the third cohort.

The themes that were uncovered and discussed were (a) frustration with the lack of meetings and attendance policy, (b) addition of more varied academic programming, with sessions appropriate for each engineering major, (c) introduction and exposure to on-campus engineering clubs and organizations, and (d) successful peer-to peer and peer-to-faculty relationships as a result of participation in the community.

Issues identified by the second cohort are more the result of conflict between what they wanted to get from the ELC program and what the program is designed to do. Similar to the data from the first ELC cohort, the first theme that was uncovered was the students' frustration with a "lack" of regular meetings and the absence of an attendance policy. The stated policy of the ELC, to meet 3 to 5 times a semester, was exceeded for the second cohort. The ELC members' interest in more meetings gives the program the flexibility to add programming; however, the program was not staffed at a level that allowed for more meetings. The ELC guidelines do not require attendance at all meetings, rather, students are asked to provide prior notice and explanation for any meetings they will miss. It became progressively clear throughout the focus group that some ELC students were unhappy with the attendance policy; however, the ELC is not meant to operate like a for-credit class. Students make a commitment to the ELC and are expected to come to as many meetings as possible, but ultimately the responsibility is theirs regarding attendance.

The second emergent theme from the focus group with the second ELC cohort was the addition of programming relevant to each engineering major. The University offers four engineering

degree concentrations: mechanical, electrical and computer, civil and environmental, and chemical engineering. The students in the focus group felt the academic programming was too broad in nature and was not tailored to each specific major. For example, one of the well-attended academic programs offered in the fall 2010 was a session on Microsoft Excel. One student commented, "Half of the group already knew Excel so we were bored during that program. I think we should choose our activities or get the chance to make suggestions on what programs we want to learn about." Another student added, "I learned Excel extensively in high school. I would have wanted to see more academic programming where we could have all participated in a non-classroom engineering project." Academic programming could be offered at multiple levels, e.g., separate Excel introductory and intermediate sessions.

In the focus group a student said:

The academic programming was a little boring for me. As an engineering major I wanted to do engineering related projects. It would have been cool to team up with some of the sophomore engineering students and hear what they had to say about the {University} engineering program from their perspective. Maybe we could have built something together or done a project together. That would have been better than watching a demonstration on Excel or listening to study tips.

The first cohort had a chance to meet with junior and senior students to talk about their projects. This was not done for the second cohort, because of the number of other meetings planned. Future cohorts should be provided an opportunity to meet with more advanced students. Having them work on projects is probably too much of a commitment, given their already full schedules.

The third theme that emerged from the data was the students' desire to be introduced and exposed to on-campus engineering clubs and organizations. The University supports five engineering clubs: AIChE (Chemical), ASCE (Civil), ASME (Mechanical), IEEE (Electrical), and SWE (Society for Women Engineers). One student said, "I went into an ASME meeting and I felt awkward and out of place. Everyone just looked at me. I tried to find a seat but I felt uncomfortable so I just left." Another student commented, "I agree. It would be great if all of the engineering clubs could present a little about their organization at one of our meetings. I want to join IEEE but I have no idea when they meet." A third student commented:

I was disappointed that the ELC did not introduce us to the various engineering clubs on campus. I really wanted to get to know ASCE but I was not going to just walk into a meeting on my own. It would have been nice to have a representative from each club come to an ELC meeting to introduce the organization and invite us to come check it out.

The focus group participants were actively engaged in a conversation about the various engineering clubs and what they had heard about each of them. One club builds a robot, another a car. It was clear from their enthusiastic discussion that there was a definite interest in building bridges between the ELC program and the engineering clubs. The students were introduced to the engineering clubs in Freshman Engineering Clinic I, which also gave them extra credit for attending engineering club meetings. A session could easily be added to the ELC zero-credit seminar focused on engineering clubs. If this was done later in the first semester, students

already involved could talk about their experience, helping other student become more comfortable going to engineering club meetings.

The final emergent theme was the success of the students in formulating peer-to-peer and peer-to-faculty relationships. There was an overwhelming affirmation that the participants felt connected to each other, despite the irregular meeting schedule, and felt connected to the ELC faculty members. One student said:

I liked the ELC because you met people right away that were involved in your majors. My suite had three engineering majors. We helped each other with homework. We had clinic together so we would remind each other about homework assignments.

Another student added, "I do like my clinic teacher, he has helped out a lot."

In such a challenging discipline peer support is crucial.<sup>22</sup> Engineers at the University have their four years of college mapped out from their first semester through graduation. Without the possibility of fitting in many less stressful electives, peer and faculty relationships become extremely crucial. The participants in the focus group responded favorably to the peer and faculty support they received during their fall semester. One student said, "I really liked Freshman Engineering Clinic I because we got to work together as a group. I got a lot better at writing labs because of our teacher. We had a really good relationship with the professor." Another student added, "My first semester of college would not have gone as smoothly if I wasn't living with my peers and going to the same classes. It was really helpful."

*Survey Results:* In January 2011 all freshman and sophomore engineering students completed an online survey regarding their experiences at RU. Surveys were returned by 109 students out of 319 students (34%), 72 males and 37 females, 55 freshman and 54 sophomores. Ninety were not in the ELC and 19 were in one of the two ELC cohorts. It is important to note that the population included both ELC cohorts. Results are given in Table 2.

Statistical methods were used to compare the responses of ELC and non-ELC students. It was not possible to analyze the results of the five questions in Table 2 with the standard chi-square test for homogeneity (with the alternative hypothesis being "the two populations are following different distributions"), as an assumption is violated (more than 20% of the cells had expected counts less than 5). Collapsing the two "disagree" groups did allow the analysis for Questions 1, 2, 4 and 5, with significance at the 10% level only for Question 4 (p-value = 0.0851), though for Question 1 the p-value is 0.1261. Question 3 required collapsing the "agree" groups as well, allowing the use of Fisher's exact test. The proportion of students who answer "agree" to Question 3 is significantly higher for the ELC students than for the non-ELC students (p-value < 0.0001). Analysis of Questions 1, 2, 4 and 5 in the same manner yields significance only for Question 1, with the proportion who answer "agree" being significantly higher for the ELC students (p-value = 0.0376).

The question with a statically significant difference between ELC and non-ELC students when results are collapsed into three categories ("strongly agree", "agree", and "disagree") is "I have built strong relationships with other students in the College of Engineering" (Question 4). Results indicated that 68.3 % of ELC and 41.7 % of non-ELC students strongly agreed with the



question. ELC students appear to be more likely to strongly agree that they built strong relationships with other engineering students.

Table 2: January 2011-ELC vs. Non-ELC Experience Survey (in percentages)

<b>Please evaluate your experiences by indicating your level of agreement with the following statements:</b>	<b>Membership</b>	<b>Strongly Agree</b>	<b>Agree</b>	<b>Disagree</b>	<b>Strongly Disagree</b>
I feel connected to the University campus	ELC	58.3	29.2	12.5	0
	Non-ELC	46.4	20.3	33.3	0
I experienced a smooth transition from high school to college	ELC	28.3	47.6	19.3	4.8
	Non-ELC	35.7	49.1	11.9	3.3
I have strong relationships with the engineering professors and/or faculty	ELC	45.8	41.7	12.5	0
	Non-ELC	3.6	21.7	55.4	19.3
I have built strong relationships with other students in the College of Engineering	ELC	68.3	22.7	4.5	4.5
	Non-ELC	41.7	45.2	11.9	1.2
I am satisfied with the overall quality of my experiences at University	ELC	37.5	54.2	8.3	0
	Non-ELC	27.3	63.6	6.7	2.4

The two questions with statically significant differences when results are collapsed into two categories (“agree” and “disagree”) are: “I feel connected to the University campus” (Question 1) and “I have strong relationships with the engineering professors and/or faculty” (Question 3). Results indicated that 87.5% of the ELC respondents strongly agreed or agreed that they felt connected to the Rowan University, compared to 66.7% of the Non-ELC respondents. Furthermore, 87.5% of the ELC respondents strongly agreed or agreed that they had formed strong relationships with the engineering faculty, compared to only 25.3% of Non-ELC respondents. It appears that the ELC increased students’ connections with campus and faculty.

No significantly significant differences were obtained for the remaining two questions: “I experienced a smooth transition from high school to college” (Question 2) and “I am satisfied with the overall quality of my experiences at University” (Question 5). Even this can be viewed as a positive result, given that all of the ELC students were from families with financial need and a majority from under-represented groups in Engineering. It is not possible, given the available data, to compare ELC students to Non-ELC student controlling for financial need and membership in underrepresented groups. Furthermore, the high proportion of all respondent strongly agreeing or agreeing with the questions (83% and 91%, respectively) left little room for improvement for the ELC members.

*Retention Rate Results:* The retention rates for ELC and Non-ELC students entering in Fall 2009 (first to second year) are identical (Table 3). This can be considered a positive result, given the College of Engineering's overall high retention rate, and the fact that the ELC students are all from families with financial need and most are from under-represented groups. Future work will focus on using more advanced techniques, such as multiple regression, to explore retention factors controlling for financial need and membership in underrepresented groups.

For the ELC cohort entering in Fall 2010 (the second cohort), two students are no longer enrolled at RU and one switched to the College of Liberal Arts and Science, giving an engineering retention rate of 86%. Unfortunately, data on the retention rate of the entire class entering Fall 2010 is not yet available. The increase in retention (compared to the first cohort) indicates that the changes implemented between the first and second ELC cohorts may have been effective.

Table 3: Engineering Student Retention (Fall 2009 cohort)

Student Enrollment	Number (Percent)	
	ELC	Non-ELC
Students entering in Fall 2009	22 (100)	137 (100)
Students Retained in College of Engineering as of Fall 2010	18 (82)	112 (82)
Students Retained in other Rowan College as of Fall 2010	2 (9)	10 (7)
Did not Return to Rowan	2 (9)	15 (11)

Though the current NSF S-STEM grant did not provide scholarships to a third cohort, the positive results of the first two ELC-cohorts were such that it has been continued, without scholarships, for students entering in Fall 2011. This allowed the incorporation of recommendations identified through the focus group with the second cohort, including replacing Composition I with Chemistry I (to maximize the number of lab courses in the ELC) and excluding Honors students from the ELC (because they have to take Honors sections of some of the "ELC classes").

## Conclusions

The S-STEM Scholarship program and ELC follows a continuous improvement process. Professors carefully observe students in class and during extracurricular events. Focus sessions and surveys are used to identify improvement opportunities. Improvements are incorporated as soon as possible. A number of conclusions were identified from focus groups and surveys that may help ELCs at other institutions:

- Enrolling students in a zero-credit ELC seminar ensures that all students can attend each extracurricular event.
- Regular meetings will be appreciated by students, e.g., once a week or biweekly. Despite their heavy workload, engineering ELC members are interested in attending 2-4 meetings a month. If meetings will not be every weekly or biweekly, a schedule of meetings early in each semester should be provided.
- Some students may be happier with a mandatory attendance policy. If the attendance policy is not mandatory, this should be clearly explained.
- Scheduling more social events early in the first semester will quickly cement student-student bonds.

- Academic programming should be targeted to multiple levels of expertise, to accommodate different students.
- Students will benefit from academic programming focused on engineering clubs.
- ELC-linked courses with labs provide more opportunities for student-student interaction and thus provide more value to the ELC.
- A dorm with study rooms will provide more opportunities for ELC participants to develop peer relationships.
- ELCs can increase students' self-reported student-student and student-faculty relationship strength, as well as connection to the Institution.
- ELCs may improve students' perception of their transition to college and may improve retention, but this was difficult to demonstrate definitely given the data available. Future work will focus on controlling for financial need and membership in underrepresented groups to further explore the impact on transition to college and retention.

## References

1. Browne, M. N., & Minnick, K. J. (2005). The unnecessary tension between learning communities and intellectual growth. *College Student Journal*, 39(4), 775-783.
2. Pike, G. (1999). The effects of residential learning communities and traditional residential living arrangements on educational gains during the first year of college. *Journal of College Student Development*, 40(3), 269-84.
3. Zhao, C. M., & Kuh, G. D. (2004). Adding value: Learning communities and student engagement. *Research in Higher Education*, 45(2), 115-138.
4. Gabelnick, F., MacGregor, J., Matthews, R., & Smith, B. L. (1990) Learning Communities: Building connections among disciplines, students, and faculty. *New directions for teaching and learning*. San Francisco, Ca: Jossey-Bass.
5. Inkelas, K. K., Vogt, K. E., & Longerbeam, S. D. (2006). Measuring outcomes of living-learning programs: Examining college environments and student learning and development. *The Journal of General Education*, 55(1), 40-76.
6. Knight, W. (2003). Learning communities and first-year programs: Lessons for planners. *Planning for Higher Education*, 31(4), 5-12.
7. Meath-Lang, B. (1997). Dramatic interactions: Theater work and the formation of learning communities. *American Annals of the Deaf*, 142, 99-101.
8. Johnson, J. (2001) Learning communities and special efforts in retention of university students: What works, what doesn't, and is the return worth the investment? *Journal of College Student Retention: Research, Theory, and Practice*, 2(3), 219-238.
9. Johnson, W. G. (2006) Strategies for enhancing student learning in the residence halls. *New Directions for Student Service*, 75, 69-82.
10. Inkelas, K. K., & Weisman, J. L. (2003). Different by design: An examination of student outcomes among participants in three types of living-learning programs. *Journal of College Student Development*, 44(3), 335-368.
11. Levin, J., & Tompkins, D. (1996). Making learning communities work: Seven lessons from Temple University. *American Association of Higher Education Bulletin*, 6(2), 3-6.
12. Pasque, P. A. & Murphy, R. (2005). The intersections of living-learning programs and social identity as factors of academic achievement and intellectual engagement. *Journal of College Student Development*, 46(4), 429-441.

13. Schroeder, C. C., Minor, F. D., & Tarkow, T. A. (1999). Freshman interest groups: Partnership for promoting student success. *New Directions for Student Services*, 87, 37-49.
14. Denzine, G., & Kennedy, A. (1997). Creating *learning communities* across the lifespan. *Journal of College Student Development*, 38, 668-9.
15. Elkins, S., Braxton, J., & James, G. (2000). The impact of a living learning center on students' academic success and persistence. *Research in Higher Education*, 41(2), 251-268.
16. Pike, G. (1997). *The effects of residential learning communities on students' educational experiences and learning outcomes during the first year of college*. Proceedings of the Association of the Study of Higher Education, Albuquerque, NM.
17. Schussler, D. L., & Fierros, E. G. (2008). Students' perceptions of their academics, relationships, and sense of belonging: Comparisons across residential learning communities. *Journal of the First Year Experience & Students in Transition*, 20(1), 71-96.
18. Stassen, M. (2003). Student outcomes: The impact of varying living-learning community models. *Research in Higher Education*, 44(5), 581-613.
19. Pike, G., & Kuh, G. (2005). First- and second-generation college students: A comparison of their engagement and intellectual development. *The Journal of Higher Education*, 76(3), 276-300.
20. Cabrera, A. A., & Castaneda, M. (1993). College persistence: Structural equations modeling test of an integrated model of student retention. *Journal of Higher Education*, 64(2), 123-136.
21. Habley, W., & McClanahan, R. (2008, July). *What works in student retention?* Presented at the ACT Information for Life's Transitions Seventeenth Annual Enrollment Planner's Conference, Chicago, IL.
22. LaVine, M., & Mitchell, S. (2006). A Physical education learning community: development and first-year assessment. *Physical Educator*, 63(2), 58-68.
23. Blackhurst, A. E., Akey, L. D., & Bobilya, A. J. (2003) A qualitative investigation of student outcomes in a residential learning community. *Journal of the First Year Experience and Students in Transition*, 15(2), 35-59.
24. Kuh, G. D., Schuh, J. H., & Whitt, E. J. (1991). *Involving colleges: Successful approaches to fostering student development and learning outside of the classroom*. San Francisco, CA: Jossey-Boss.
25. Creswell, J. W. (2003). *Research design: Qualitative, quantitative, and mixed methods approaches* (2<sup>nd</sup> ed.). London, UK: SAGE.
26. Astin, A. W. (1993). *What matters in college: Four critical years revisited*. San Francisco, CA: Jossey-Bass.

## Acknowledgements

The authors thank Dex Whittinghill, associate professor of Math at Rowan University, for conducting the statistical analysis of the data contained in Table 2.

## Appendix: Focus Group Details

Relevant student comments are provided to support the themes identified by the focus groups.

2009-2010 ELC (April 23, 2010 focus group-First Cohort) main points:

On Friday, April 23, 2010, 12 out of 21 students who participated in the ELC voluntarily participated in a focus group discussion about their individual and collective experiences with the ELC community over the course of the 2009-2010 academic year. The data from the transcribed focus group were evaluated for emerging themes.<sup>25</sup> This feedback was particularly important since the community was the pilot cohort for the residential learning community. Through meticulous data analysis themes emerged from the data about the similar experiences of the ELC participants. First, there was a clear consensus that the ELC participants wanted more social programming. Second, all of participants wanted more consistent meeting times. Third, many of the focus group participants agreed that the ELC residence hall did not provide ideal living conditions for group activities. Fourth, many of the participants noted their desire to live with non-engineering roommates and suitemates as well as ELC members. Fifth, ELC participants wanted more or stronger peer-to-peer relationships. A majority of the students attributed the insufficient peer support with the lack of social programming. Sixth, peer-to-faculty relationships were strong as a result of participation in the Engineering Living and learning Community. The final emergent theme was the ELC participants' lack of connection to the RU campus.

### *Emergent Theme 1 - Social Programming: Making Connections and Building Relationships:*

- During the discussion one student stated, "I did not consider any of the programs social." The participants expressed a sincere desire to have more social programming so that they could interact with each other more outside of the classroom cohort. In the first theme, the lack of social programming in the ELC, the participants seemed to agree that the social programming was a critical piece of the experience that they lacked and genuinely craved from the community. The social component was noticeably absent from their overall experience with the community. Students were quick to highlight their positive programming experiences with the academic events, like the calculator seminar and the tech park trip, but they were disappointed with the deficiency of social programming.
- One student said, "I liked the tech park trip and the calculator session, but I don't know how social these programs can be considered." Another student replied, "I was more satisfied with the educational activities than the social."
- One participant said, "There was only the initial social meeting and that was a good thing as an ice-breaker." Another adding, "There needs to be more social activities, especially early on, this would be more effective." It was obvious from the focus group that the students clearly missed out on the social piece that the ELC could offer to the students.
- One of the students remarked, "The ELC needs more social events to help everyone in the group get to know each other." The absence of entertaining, non-academically based community programming was obvious to the ELC participants. Since the meeting times were sporadic and not mandatory, and with only one identifiable social program offered in the fall 2009 semester, many students were not able to participate in any social programming at all.

- One student said, “There was only one social program and I could not go.” An uproar of laughter exploded after one ELC participant shouted, “What social programming?”
- Several participants suggested various ideas for social programs for the 2010-2011 ELC cohort. Their suggestions ranged from a movie night, to a group volleyball game, to an off-campus bowling event. A number of students mentioned the importance of incorporating social events early in the fall semester.
- One student said, “There needs to be more social activities, especially early on, this would be more effective.”
- Another student added, “I had to make friends on my own because there was no activities in the beginning of the semester that brought us all together. I would see the same people in class but unless we were paired on an assignment no one went out of their way to get to know each other.”
- The participants made it clear that the ELC did provide the students the ability to meet and interact with other engineers.
- One said, “The ELC enabled me to get to know other engineers better and sooner.” However, several students noted that it could have been easier to make these connections with others if the program fostered a more social environment.
- One responded, “The ELC helped improve my relationships and get to know people better, but I did not feel like it was a family.”
- Another student said, “I made friends with several people in the learning community, but I think more meetings would allow me to interact with more people.”
- The participants expressed a sincere desire to have more meetings and social programming so that they would be able to interact with each other more outside of the classroom cohort.

*Emergent Theme 2 - To Meet or Not to Meet:* A second theme uncovered was the lack of, inconvenience of, and inconsistency of the ELC meetings. All of the focus group participants agreed that the ELC meetings were too infrequent and the meeting times were not convenient for the majority. Although many of the students claimed that there were not enough meetings or that the number of meetings were lacking; overall the participants enjoyed the ELC meetings they did attend.

- One student said, “The most satisfying aspect was the meetings, learning about new things on campus, and having people I know in my classes.”
- It was no surprise to hear several students mention the shortage of group meetings and the inopportune meeting times.
- “It was disappointing that we did not have enough meetings,” said one student.
- Another student poignantly remarked, “The times and amount of meetings really limited the effectiveness of the learning community.”

It became increasingly clear that the students wanted to have regular meetings. The ELC meetings were sporadic and usually not mandatory. There was no universally convenient time for the entire group to meet. The Director did his best to accommodate everyone’s schedule by sending out e-mail requests for the students to fill out charts with their available free time. The Director would then compile all the results to try and find a mutually beneficial time to host the meetings. Unfortunately, even when a majority of the students could attend the ELC meetings,

due to the non-mandatory unwritten meeting policy, many of the students who could have attended the meetings simply chose not to attend.

All of the participants agreed that the meetings were too infrequent and the meeting times were not convenient for the majority. Several students mentioned that they did not attend any meetings and expressed regret that they were unable to participate.

- One student expressed his unhappiness saying, "With my job and my workload the meetings were impossible to attend. I heard some of the events were fun. I wish I could have been there."
- Another student added, "Only some of the students were able to go to all of the meetings. I only came to two meetings but the ones I went to were fun. I would have gone to all of the meetings if I could have fitted it into my schedule. The meeting dates and times were really sporadic."
- Although many of the students claimed that there was not enough meetings or that the number of meetings were lacking, overall the participants enjoyed the ELC meetings they had attended, one student said, "I really enjoyed the meetings. We always had fun, learned something new, and got to hang out as a group."

*Emergent Theme 3 - Residence Hall Woes:* Another theme that materialized was the choice of residence hall. Many participants suggested moving the program to a different residence hall, with better lighting, bigger rooms, cleaner facilities, and larger common space to meet as a group.

- One student said, "M\_\_ Hall is really small and cramped."
- The choice of residence hall is a powerful context for learning because the hall is the place where the LLC forms its identity and the community environment.

*Emergent Theme 4 - Residing with Non-ELC and Non-Engineering Majors:* The fourth theme that surfaced was the inclusion of non-ELC and non-engineering majors into the residence hall ELC floor. There was a common sentiment that the Engineering Living and Learning Community program did not support, aid, or assist the students in making connections with peers outside of the ELC.

- One student said, "I did not have the chance to interact with people outside of the ELC or engineering community."
- Another student added, "The ELC did not improve my connection to others greatly."
- The students in the focus group seemed to recognize the value in living with engineering peers, however, many suggested non-engineering roommates or suitemates to be mixed into the living quarters. A majority of the focus group participants recognized the importance of befriending peers outside of the ELC and the engineering major, and many ELC students expressed their interest to live with non-engineering peers.
- While a majority of the focus group participants adamantly supported the addition of non-ELC and non-engineers into the living quarters, it is important to note that two students vehemently disagreed that this hybrid living situation be implemented for the 2010-2011 cohort.
- One student immediately chimed in, "Living with people who had the same major, focus, and goals you get to know people quicker. When you will be spending the next 3 to 4 years with people it is helpful to know they are available for help almost 24/7."

- Another student added, “Knowing that if you ever got stuck on something you could ask your suitemates for help and double check your answers on homework was great.”
- Yet the focus group participants expressed an inability to meet and interact with students outside of the engineering discipline due to their involvement with the ELC program.
- One said, “It was a bit harder to meet people out of my major.”
- Another student agreed saying, “While it was nice to live with all engineers, I feel that they are the only people I know. I felt a little isolated in a way that I didn’t get to become better friends with people from other majors and I can’t relate to others as easily.”

*Emergent Theme 5 - Lack of Peer-to-Peer Relationships:* A theme that became evident very early in the focus group was the lack of peer-to-peer relationships.

- “I recognize a lot of people from the ELC and know most of them by name, but I am not very close with all of them,” said one student.
- A majority of the focus group participants shared this sentiment. Many of the students identified roommates or suitemates that may or may not be a part of the ELC program as friends, but acknowledged other participants of the community as merely members of the same residential community group, not friends per se.
- It is no secret that the engineering discipline can be very challenging. Without a lot of room for free electives, feeling connected to peers can be crucial in terms of support and student development for the participants.
- One said, “Most of my classes are locked in. I had to pick certain classes that interfered greatly with the schedule I really wanted.”
- This is commonplace for many engineering majors, not only at RU, but also in many schools around the country. The engineering disciplines do not allow for much class registration freedom, so being able to be around a supportive peer network can make a big difference in terms of enjoying the courses and is crucial to the success of a residential learning community.
- A majority of the focus group participants did not build strong connections with peers despite residing on the same floor and taking identical courses.
- “I knew some of the people, but since I did not live with them, my relationships were not as strong with everyone.”
- Another student added, “I could have gotten to know people better. The program needs more meetings and social events which would have helped me build stronger relationships with my peers.”
- The lack of meetings and social programming components of the program tended to be repeated throughout the focus group discussion.
- “I got to meet some people in the ELC, but I felt I really was not able to meet everyone because of the times of the meetings.”
- Another student said, “Since I could not make it to many meetings I did not get to know many of the members besides my roommate.”



*Emergent Theme 6 - Peer-to-Faculty Relationships:* The sixth theme that emerged during the focus group discussion was the strong relationships between the ELC participants and the ELC faculty.

- “I felt more comfortable talking to my professors and a lot of them already knew me because I was involved in the ELC program before I even started my first class.”
- It was clear from the discussions that the ELC increased students' interaction and relationships with faculty. The participants seemed to agree that their participation in the Engineering Living and Learning Community was extremely valuable in terms of building relationships with the engineering faculty and staff.
- “My participation in the ELC definitely improved my opportunities to interact with professors. By going on trips and having meetings with the professors, I was able to form a better relationship with them.”
- The ELC provided the foundation for these relationships to form and continue to grow throughout the participants' college careers at Rowan University.
- “I feel like I have started to develop good relationships with some of my professors and the staff in the Engineering Building,” said one student.
- Academic programming was a large component of the ELC experience. Most of the academic events were hosted by ELC faculty. This out-of-the-classroom programming allowed the students to build unique relationships with the faculty.
- A trip to the Tech Park gave the students a sneak peek into what the junior and senior engineering student projects looked like. They also got the opportunity to spend out of class time with the professors.
- “On the tech park trip I got to see a more casual side of the professors which I liked.”
- This particular activity was beneficial for everyone who was able to attend.
- “The tech park trip allowed us to interact with different professors we might not have interacted with otherwise.”
- It was clear from the discussions that the ELC increased student's interaction and relationships with faculty.

*Emergent Theme 7 - Connection to Campus:* The last theme that emerged was the ELC participants' strong association to the College of Engineering, but an obvious lack of connection to the Rowan University campus. There was an overwhelming affirmation that the participants felt a strong connection to the Rowan University College of Engineering, but did not feel a tie to the RU campus outside of the College of Engineering. Many participants felt lost, isolated, or even cut off from the actual university and campus-life.

- One student stated, “I was connected to the Engineering School. I was not connected to RU. I feel like an engineering student, not a Rowan University student.”
- Another said, “The ELC made me feel connected to the college of Engineering, but not the university as a whole.”
- A majority of the other participants in the focus group concurred, “The ELC improved my belonging in the RU Engineering program, but not so much to the actual university.”

2010-2011 ELC (December 2010 focus group-Second Cohort) main points:

A focus group was conducted in December 2010 in order to assess the students' thoughts, feelings, perceptions, and the impact that the ELC had on the students' overall experiences in Fall 2010. Four males and one female attended the volunteer focus group, which lasted for approximately one hour. The focus group was audiotaped, transcribed, and coded. Questions were pre-determined prior to the group discussion, however the open-ended forum allowed for subsequent follow-up questions to be asked, if necessary, to further clarify responses (Creswell, 2003). The data that were collected and analyzed were utilized to make recommendations for the redesign and recalibration of the ELC program for the spring 2011 semester.

The data from the transcribed focus group were evaluated for emerging themes.<sup>25</sup> The themes that were uncovered and discussed in this cycle were (a) frustration with the lack of meetings and attendance policy, (b) addition of more varied academic programming pertaining directly to each engineering major, (c) introduction and exposure to on-campus engineering clubs and organizations, and (d) successful peer-to-peer and peer-to-faculty relationships as a result of participation in the community.

*Theme 1 - Attendance policy and meetings:* Similar to the data from the focus group with ELC members from the first cohort, the first theme that was uncovered was the students' clear frustration with the lack of regular meetings and the absence of an attendance policy. The 2010-2011 ELC cohort still met infrequently despite the inclusion of a built-in meeting time on each of their class schedules. The ELC faculty advisor did not insist on a mandatory attendance policy, which impeded consistent attendance at the meetings, events, and activities. Since attendance was more or less optional, the programs, which were designed to satisfy and support the ELC participants' needs and the goals of the LLC, tended to be hit or miss with the participants. It became progressively evident throughout the focus group that a clear majority of the students voiced their displeasure with the laissez-faire attendance policy and the sporadic scheduled meetings. During the discussion one student stated, "I didn't like how participation was not mandatory. I think that random meetings that aren't mandatory caused a lot of confusion." Another student added:

At the first Wednesday meeting I thought the meetings would be mandatory which I was fine with. I wouldn't have minded meeting every week or every other week. I don't think that's too demanding. If the meetings are optional a lot of engineers are going to opt not to come because we are busy. But if the meetings were mandatory and the times were built into our schedules we were confused about having to participate or not.

It became gradually evident that the students craved stability and structure in the program. The participants wanted to have regular weekly or bi-weekly meetings in which the attendance policy was clear. All of the participants agreed that the meetings were too infrequent and the relaxed attendance policy was confusing and frustrating to the ELC members.

All of the participants acknowledged the absence of regular group meetings. The participants articulated that the ELC meetings were intermittent and there seemed to be resentment amongst the group that some students attended all the events while others did not attend any. Several students mentioned that they were aware of a few students who attended only one ELC meeting

or event and that it went completely unnoticed by administration. One student commented, “If given the choice I bet no one would come to some of the activities. A lot of us found it unfair that some people attended a lot of events while others came to just one.”

*Theme 2 - Varied academic programming:* The second emergent theme was the addition of more varied academic programming pertaining to each engineering major. Rowan University offers four engineering degree concentrations: mechanical and environmental, electrical and computer, civil, and chemical engineering. The students in the focus group felt the academic programming was too broad in nature and was not tailored to each specific major. For example, one of the well-attended academic programs offered in the fall 2010 was a session on Microsoft Excel. One student commented, “Half of the group already knew Excel so we were bored during that program. I think we should choose our activities or get the chance to make suggestions on what programs we want to learn about.” Another student added, “I learned Excel extensively in high school. I would have wanted to see more academic programming where we could have all participated in a non-classroom engineering project.” In the focus group a student said:

The academic programming was a little boring for me. As an engineering major I wanted to do engineering related projects. It would have been cool to team up with some of the sophomore engineering students and hear what they had to say about the Rowan engineering program from their perspective. Maybe we could have built something together or done a project together. That would have been better than watching a demonstration on Excel or listening to study tips.

*Theme 3 - Engineering clubs and organizations:* The third theme that emerged from the data was the students' desire to be introduced and exposed to on-campus engineering clubs and organizations. Rowan University supports five engineering clubs: AIChE (Chemical), ASCE (Civil), ASME (Mechanical), IEEE (Electrical), and SWE (Society for Women Engineers). One student said, “I went into a ASME meeting and I felt awkward and out of place. Everyone just looked at me. I tried to find a seat but I felt uncomfortable so I just left.” Another student commented, “I agree. It would be great if all of the engineering clubs could present a little about their organization at one of our meetings. I want to join IEEE but I have no idea when they meet.” A third student commented:

I was disappointed that the ELC did not introduce us to the various engineering clubs on campus. I really wanted to get to know ASCE but I was not going to just walk into a meeting on my own. It would have been nice to have a representative from each club come to an ELC meeting to introduce the organization and invite us to come check it out.

The focus group participants were actively engaged in a conversation about the various engineering clubs and what they had heard about each of them. One club builds a robot, another a car. After a few minutes listening to the students converse and debate back and forth about each club, I regained order and moved on to the next question. It was clear, however, from their enthusiastic discussion about the engineering clubs that there was a definite interest in building bridges between the ELC program and the on-campus engineering clubs.

*Theme 4 - Successful peer-to-peer and peer-to-faculty relationships:* The final emergent theme was the success of the students formulating peer-to-peer and peer-to-faculty relationships. There

was an overwhelming affirmation that the participants felt connected to each other, despite the inconsistent meeting schedule, and felt connected to the ELC faculty members. One student said:

I liked the ELC because you met people right away that were involved in your majors.

My suite had three engineering majors. We helped each other with homework. We had clinic together so we would remind each other about homework assignments.

Another student added, "I do like my clinic teacher, he has helped out a lot. He has been more than helpful."