

6-1-2017

# Living-learning communities: The impact of freshmen engineering students and influence of student workers

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**LIVING-LEARNING COMMUNITIES: THE IMPACT OF FRESHMEN  
ENGINEERING STUDENTS AND INFLUENCE  
OF STUDENTS WORKERS**

by

Felicia Crockett

A Thesis

Submitted to the  
Department of Educational Services and Leadership  
College of Education

In partial fulfillment of the requirement

For the degree of  
Master of Arts in Higher Education

at

Rowan University

May 31, 2017

Thesis Chair: Burton R. Sisco, Ed.D.

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## **Dedication**

This thesis is dedicated to my best friend, my voice of wisdom, my heart, my guardian angel, my beloved late mother, Vera T. Crockett. It is because of her strength, love, and unwavering belief in me that motivates me to continue to achieve my dreams.

## **Acknowledgments**

The completion of this thesis could not have happened without the grace of God, I can do all things through Christ who strengthens me (Philippians 4:13). I know that this is only the beginning of my journey. I'm still working on my MASTERPIECE!!

To my family...thank you for all your love, support, and encouragement throughout this journey. To my Aunt Becky and my Godmother Niecy you have been my cheerleaders from the very beginning and constantly reminding me of how proud my mother would be of all my accomplishments thus far. To my second family Mr. and Mrs. Gaines and Mr. and Mrs. Meyers...words cannot describe the amount of appreciation and gratitude that I have for all that you have done for me. To my team TNT (Tamika, Naima, and Tamira)...what can I say you are dynamite. Thank you all for sharing your passions, purposes, and wisdom with me. You are the greatest support system turned family that I could ever ask for and I am proud of all of your accomplishments.

To Dr. Burton Sisco, Dr. Marybeth Walpole, and the Department of Educational Services and Leadership College of Education...thank you for giving me such an amazing learning and growing opportunity that has forever changed my life. To Dr. Everett and the entire Engineering Learning Community (ELC) thank you for all your assistance towards the completion of this thesis.

Last but certainly not least, I would like to thank everyone in my cohort for the countless laughs and cherished memories. Continue to be lifelong learners and change the world of higher education. Cheers to you all!!

## **Abstract**

Felicia Crockett

**LIVING-LEARNING COMMUNITIES: THE IMPACT ON FRESHMEN  
ENGINEERING STUDENTS AND INFLUENCE OF STUDENT WORKERS  
2016-2017**

Burton R. Sisco, Ed.D.

Master of Arts in Higher Education

The purpose of this study was to investigate the impact of an engineering learning community (ELC) on freshmen engineering students and the influence of student workers. This study used a total population of the Engineering Learning Community (ELC), which included 127 freshmen engineering students, 69 participated in the survey and five volunteered to participate in a focus group interview. The survey collected demographic information and responses to statements regarding students transition to college, their connectedness to Rowan, their peer interaction, faculty interaction, and their overall satisfaction at Rowan. The interview questions asked about their most and least satisfying aspects of participating in the ELC and what recommendations they had to help improve the ELC. Through data analysis, findings suggested that participating in the ELC had some impact on their peer interaction, faculty interaction, their connectedness to Rowan, student worker interaction, and overall satisfaction at Rowan. Through content analysis the responses from the focus group showed that there were more satisfying than less satisfying aspects from participating in the ELC and with implementing the recommendations, the ELC can enhance its services to freshmen students.

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## **Chapter I**

### **Introduction**

Living-learning communities (LLCs) serve to provide a collaborative living and learning experience for motivated students and dedicated faculty and staff. The design of living-learning communities is intended to improve and enhance the learning and overall success of students, by means of socially constructing knowledge through intentionally shared experiences (Browne, & Minnick, 2005; Pike, 1999; Zhao, & Kuh, 2004). They help develop strong peer relationships and enhance academic achievement, retention, and educational attainment ( Gabelnick, MacGregor, Matthews, & Smith, 1990; Inkelas, Vogt, Longerbeam, Owen, & Johnson, 2006; Knight, 2003; Meath-Lang, 1997; Schroeder, Minor, & Tarkow, 1999). LLCs are present at a number of different colleges and universities and they vary from type and size. One type of LLC is the Engineering Learning Community (ELC) at Rowan University, whose main focus is on students who want to pursue engineering careers.

There is a long history in the United States involving living-learning communities (LLCs) since Alexander Meiklejohn established the experimental college (Nelson, 2009). Research has shown that the residential component of LLCs has a major influence on increasing the retention rate of participating students as a result of their strong academic, peer and faculty support systems, increased faculty interactions, and collaboratively innovative teaching and learning techniques (Cabrera & Castaneda,1993; Habley & McClanahan, 2008; Johnson, 2006). LLCs are so effective because they do not leave learning to chance and have interventions in place to assist students throughout their

college transition. The structure, organizational flow, and commitment from the faculty and institution of a LLC sets it apart from all other programs and increases its sustainability and success. The benefits can be seen throughout all levels of the institution from higher academically performing students, to improved teaching techniques, to increased retention rates, and strong connectedness of educational objectives to the college or university mission (Tinto, 2003; Zhao & Kuh, 2004).

### **Statement of the Problem**

With an increase in demand of engineers in the United States, colleges and universities are faced with the issue of providing a quality education for engineering students that prepares them to be successful in their careers (Marra, Tsai, Bogue, & Pytel, 2015). This demand will not be met, as a result of the consistently low number of high school graduates planning to enter those careers. Furthermore, nationally, the undergraduate attrition rates of students majoring in science, technology, engineering, and mathematics (STEM) were lower than any non-STEM fields and make up only 48% (NSF, 2016). Colleges and universities use four institutional conditions to support and improve retention rates: information/advice, support, involvement, and learning.

Research has shown that having students become actively involved in all aspects of the collegiate experience improves retention (Tinto, 1999). The competitive and highly demanding nature of engineering majors in conjunction with a new physical and mental environment can be intimidating and too much for a freshmen engineering student to handle. The perception of a hostile climate and cultural environment and feelings of

connectedness greatly impacts the overall experience of engineering students, which can lead to dropping out, poor academic performance, transferring, or switching of majors (Hurtado & Carter, 1997; Meeuwisse, Severiens, & Born, 2010; O’Keeffe, 2013; Zepke, Leach, & Prebble, 2006).

Rowan University’s College of Engineering has established an engineering learning community (ELC) for its freshmen students, to help meet the need for undergraduate engineers in the United States of America. The goals of the ELC are connected to improving performance (retention, academic success, and college transition) and relationships (peer and student-faculty relationships, and connectedness to the university). These goals are achieved by the ELC through different services that include tutoring, mentoring, academic coaching, campus orientation, social events, community service, ELC seminar, and student workers. This study evaluated the ELC through direct observation, surveys, and a focus group to measure the impact it had on participants.

### **Purpose of the Study**

The purpose of this study was to examine the effectiveness of a freshman engineering learning community (ELC) at Rowan University. The study assessed the impact that an engineering learning community (ELC) had on its freshmen engineering students. In addition, this study investigated the impact that ELC student workers had on engineering learning students grade point average (GPA), retention rate, and the attitude of engineering students towards the program. This study is a partial replication of Flynn’s (2012) research study.

## **Significance of the Problem**

There is a significant amount of literature on standard living and learning communities. However, there is a lack of published research focused on engineering living and learning communities. Studies have shown that students who participate in these LLCs report an extremely satisfying collegiate experience, are able to transition academically, are more involved and engaged in diversified topics, and have a higher chance of completing college in four years (Zhao & Kuh, 2004). Although there are limited studies and data indicating the overall impact on freshmen engineering learning community students, studies have shown the positive impact. Research has also shown that students who put more time and effort into their collegiate experiences, becoming more involved and engaged, are more likely to have a positive impact on their development, develop a strong sense of community and belonging, and are overall satisfied with their college experience (Inkelas & Weisman, 2003; Meeuwisse, Severiens, & Born, 2010; O’Keeffe, 2013; Spanierman et al., 2013). But again, there is limited research and data that show and support the impact that an engineering learning community has on underrepresented freshmen engineering students.

Managing students coming from different high school educational environments with perhaps limited resources and support both financially and academically, freshmen engineering students are faced with other transitional issues. This study was designed to evaluate the experience of freshmen ELC students and focus on the participants’ GPA, retention rate, and attitudes towards the engineering learning community.

## **Assumptions and Limitations**

This study was completed at Rowan University in Glassboro, NJ and was limited to the students enrolled in the 2016-2017 academic engineering learning community. It is assumed that all surveys and focus questions were answered truthfully and to the best ability of the participants. Researcher perspectives and relationships to the participants in the focus group may present bias in the findings. Participants were purposefully selected to reflect diverse views of the ELC, but focus group participants may not reflect the views of all ELC members. Additionally, research was conducted towards the middle of the spring semester; it is possible that freshmen student opinions could have evolved towards the end of the academic year.

## **Operational Definitions**

1. College of Engineering: Refers to the Henry M. Rowan College of Engineering, one of 14 academic colleges at Rowan University which contains six undergraduate majors, biomedical, chemical, civil and environmental, electrical and computer, engineering entrepreneurship, and mechanical.
2. Engineering Learning Community (ELC): Refers to 135 students in the College of Engineering at Rowan during the 2016-2017 academic year who volunteered to live together, take four courses together, and participate in extracurricular activities.

3. Faculty: Refers to the teachers at Rowan University that taught the freshman engineering students during the 2016-2017 academic year.
4. Living-Learning Community (LLC): Refers to a general cluster of students who live in close proximity with a common theme and share two or more classes.
5. Resident Assistant (RA): Refers to the undergraduate students who lived on the ELC floor and were responsible for assisting the ELC students, and providing programs for them.
6. Residence Hall: Refers to the Rowan University on-campus housing facility where the ELC students lived during the 2016-2017 academic year.
7. Student Workers: Refers to the eight undergraduate former ELC students who either tutored or assisted with the ELC seminars.
8. Underrepresented Minorities (URMs): Refers to African Americans, American Indians/Alaska Natives, Hispanics, Asian, and Female students that are enrolled in the ELC and the College of Engineering.

### **Research Questions**

This study addressed the following research questions:

1. How do ELC students report their transition and sense of community and belonging to Rowan University and the College of Engineering?



2. How do ELC students report their level of interactions with peers and faculty at Rowan University and with the College of Engineering?
3. What were the satisfaction levels of students participating in the ELC?
4. What is the influence of ELC student workers on freshmen ELC students' GPA, retention, and feelings of connectedness toward the College of Engineering and Rowan University?
5. What do ELC students report about their experiences with the ELC, Rowan University, and student workers?

### **Overview of the Study**

The purpose of this study was to examine the experiences of engineering students in an engineering learning community (ELC). The goal of this study was to evaluate the impact of an ELC on participants' transitions from high school to college, their sense of community and sense of belonging to the College of Engineering (COE) and university, their faculty interaction, their peer interaction and relationships, and overall satisfaction with the ELC program.

Chapter II presents a review of literature critical to the study. This section includes a brief history of living-learning communities, the benefits of living-learning communities, feeling of sense of belonging and community, the challenges of living-learning communities, as well as an analysis of current and relevant studies.

Chapter III describes the methodology used in this study. This chapter includes the context of the study, the population and sample selection, the instrumentation, data gathering procedures, and analysis of the data.

Chapter IV presents the findings and results of the study. The chapter focuses on answering the research questions by analyzing the quantitative and qualitative data.

Chapter V summarizes the findings and discusses the results. It concludes with recommendations for practice and further research.

## **Chapter II**

### **Review of the Literature**

#### **Introduction**

Colleges and universities all across the United States have received criticism because of their insufficient integration of focused student learning. As a response to the criticism, learning communities have been established at numerous institutions to enhance the educational goals of students at the undergraduate level (Inkelas & Weisman, 2003). Learning communities are constructed to link diverse learning opportunities: courses, co-curricular and extracurricular activities, specific topics, conversations, interactions, and engagement with peers and faculty to facilitate a deeper connection and understanding of the knowledge base (Inkelas & Weisman, 2003; Inkelas, Vogt, Longerbeam, Owen, & Johnson, 2006). There is one specific difference between living-learning communities and other forms of learning communities and that is the students have to participate in curricular activities in addition to residing together in a designated residence hall that provides different academic services and programming (Inkelas & Weisman, 2003).

The premise of living learning communities is to integrate the in-classroom experience with the out-of-classroom experiences through the creation of a community that promotes an increase in faculty and peer interactions. At different institutions the foci of these communities serve different purposes, from one-year programs that seek to help at risk students improve their academic performance, to four-year programs designed for

high-performing students to provide them with more challenging opportunities, to programs open to all students with the goal of expanding their cultural and social perspectives (Inkelas & Weisman, 2003). Students that participate in these programs have demonstrated positive outcomes in the research literature (Inkelas & Weisman, 2003).

Historically, higher education has experienced a shift in the number of minority students attending and graduating from colleges and universities. As higher education continues to expand and advance colleges and universities are able to provide their students with new innovative opportunities to take the collegiate experience to the next level. One of these innovative opportunities is known as a living-learning community (LLC). In the residential field research has shown that LLCs have a positive impact on the success of the students who participate in them (Inkelas & Weisman, 2003; Inkelas et al, 2006). However, little research has been conducted on the impact that these LLCs have on the minority population.

Cabrera, A., Nora, A., Terenzini, P., Pascarella, E., & Hagedorn, L. (1999) claim that the collegiate experiences and academic performance of minority students compared to their counterparts are at opposite ends of the spectrum. When factors such as affluence, high school quality, and geographical location are controlled the disparities between both groups become less associated (Housee, 2011). Special services and programs such as Educational Opportunity Fund (EOF) Programs and TRIO programs are set in place to help narrow the race and ethnicity gap (Cowan Pitre & Pitre, 2009). TRIO educational opportunity programs have ensured college readiness and access for all students;

successfully increasing the enrollment rate and educational attainment of low-SES, first-generation, and underrepresented ethnic minority students (Cowan Pitre & Pitre, 2009). One major problem is that there is a lack of studies contrasting minorities with nonminorities (Cabrera et al., 1999).

The purpose of this study was to examine the effectiveness of a freshman engineering living-learning community (ELLC) at Rowan University. The research in this chapter covers the history, types, structure, benefits, sense of community and belonging, challenges, and relevant studies of living-learning communities. First, the historical foundation of living-learning communities is discussed. The different types of living-learning communities are examined and defined. Second, literature pertinent to how LLCs develop a sense of community and belonging, specifically how the residence hall, university, faculty and peer interaction is explored. The chapter examines the challenges facing LLCs. Lastly, relevant studies are examined.

### **History of Living-Learning Communities**

There is a long history in the United States pertaining to living-learning communities (LLCs). Towards the end of the 19th Century, there were shifts in the structure and function of higher education. These shifts in conjunction with an increase in enrollment at institutions, created a decline in availability and feasibility of living-learning communities (Ryan, 1992; Thelin, 2004). This resulted in LLCs becoming less prevalent in the United States higher education system. However, despite these shifts

LLCs in their numerous forms have remained a very transforming component of institutions all throughout the world.

Alexander Meiklejohn's experimental college at the University of Wisconsin was the beginning of living-learning communities in 1927 (Nelson, 2009). The history of learning communities continued with scholars such as Astin, Boyer, and Tinto along with reports from the late 1980s and early 1990s that restructured and transformed the curriculum and classroom learning experience to be more active and increase student involvement (Tinto, 2003). College student experiences in the classroom are independent, courses are not connected, and students are not involved in learning. A large amount of college students either commute or are working while taking classes, which leaves the classroom as the only setting where all their engagement with faculty, peers, and discussion about the curriculum occurs (Tinto, 2003). Tinto (1999) proposes that institutions of higher learning make learning communities and collaborative learning a signature component of the first-year collegiate experience. According to Smith (2001), learning communities are growing on a national scale and an increasing number of institutions are providing this uniquely innovative opportunity for their students at both public and private institutions. The scale of learning communities vary in range but they all address some of the following issues: the competency of faculty, retention of the students, increasing a sense of community and belonging, and coherence of curriculum (MacGregor & Smith, 2005; Smith, 2001). In addition to the scale of learning communities varying for each college and university, the structure of these programs exist in different forms at institutions that offer them.

**Structure of LLCs.** Learning communities come in two different forms: basic and linked courses. The basic form is a co-registration or block scheduling that allows students to take courses together that link students by tying two courses together (e.g., a writing course linked to a selected topic, literature, or current social problem). Courses are linked by a common theme, which provides a better understanding of their connection. LLCs vary but the most common types include: linked courses, freshman interest groups, cluster courses, and coordinated courses (Tinto, 2003). According to Inkelas and Weisman (2003), there are three thematic groups within these types: a) Transition Programs--for first-year students that focus on helping facilitate a smooth transition from high school to college, with the assistance of different resources (academic support, development of skills, and programs that foster an atmosphere of learning), b) Academic Honors Programs--talented students are provided a challenging academic experience through rigorous specialized classes, and c) Curriculum-Based Programs--geared towards specific topics of study or research. Though there are differences between the types of LLCs, they all have shared roles.

**Roles.** There are three objectives that almost all learning communities have in common: shared knowledge, shared learning, and shared responsibility. Shared knowledge is obtained by having students take courses together that are connected by a common theme, which promotes higher levels of cognitive complexity. Learning communities create an environment where students are able to construct knowledge and learn together, which contribute to their overall satisfaction and sense of community. Shared responsibility is achieved by having students participate in collaborative group

assignments. Learning communities transform how students are taught and how the curriculum is experienced (Tinto, 2003). This transformation is just one of the numerous benefits that are associated with participating in these programs.

### **Benefits of Living-Learning Communities**

The potential benefits that living-learning communities have to offer students, faculty, and the institutions are very important to the growth and development of a more fulfilling collegiate experience. Students who participate in these LLCs report an extremely satisfying collegiate experience, are able to transition academically, are more involved and engaged in diversified topics, and have a higher chance of completing college in four years (Zhao & Kuh, 2004). Studies indicated positive impact of LLCs on faculty with a boost in motivation and more time and energy put towards thinking outside the box. In general, the institution as a whole benefits with higher academically performing students, the evolution of better professors, increase in retention rates, and incorporating and linking educational objectives with the college or university (Tinto, 2003; Zhao & Kuh, 2004).

**Academic.** Tying the in-classroom experience with the out-of-classroom experiences has impacted the performance of college student academically. For learning communities to be effective requires that faculty and both academic and student affairs professionals to collaborate on content and pedagogy of linked courses. The faculty changes their syllabi to promote a more collaborative learning experience for students (Tinto, 2003). With a more collaborative learning design incorporating the academic



experience with the non-academic experience students are more likely to become more involved with other components of the institution.

**Student involvement.** Research has shown that students in living-learning communities form their own self-support groups outside of the classroom setting. The more time spent together out of the classroom created a supportive environment for the students that lead to more learning. Students became more actively involved beyond the classroom (Tinto, 2003). Astin's (1999, 1984) student involvement theory provides great insight into the impact of student involvement and focuses on the growth and development of college students outside of the classroom. Astin (1999) defines involvement as, "the amount of physical and psychological energy that the student devotes to the academic experience" (p. 518). Research has shown that students who put more time and effort into their collegiate experiences, becoming more involved and engaged, they are more likely to have a positive impact on their development (Inkelas & Weisman, 2003). There are three most effective and influential types of student involvement that Astin (1996) claims impacts the academic outcomes of students: involvement with academics, involvement with faculty, and involvement with student peer groups. Studies has shown that the degree to which a student is involved within the institution is just one factor that contributes to a higher retention rate.

**Retention.** Institutions of higher learning have four conditions that are supportive of retention: information/advice, support, involvement, and learning. First, students who are provided with clear, accurate information and requirements of the institution are more

likely to persist. Second, when students have immediate access to academic, social, and personal support services that are connected to their overall collegiate experience, greater persistence and retention is achieved. Third, when students are viewed as involved and valued members of the institution they are more likely to stay. Fourth, the most important condition is that retention is increased when learning is involved. Students who are learning are more likely to stay and institutions that create and foster an environment that educates their students are considered successful. The key to retention is to have students become actively involved in all aspects of the collegiate experience (Tinto, 1999). Every institution uses living-learning communities in different ways which include: serving to increase diverse student population, addressing retention issues because of the curriculum, and hosting developmental education; all approaches can improve the retention of students (Smith, 2001).

Tinto's model on student retention is the foundation from which the conceptual framework for this study is built (Tinto, 1996, 1998, 1999, 2003). According to Tinto there are two systems with distinct integration processes that make up the institution of higher education: an academic and a social system. Academic integration is accomplished through the interaction with faculty and high academic achievement. Social integration is accomplished through interaction with peers and partaking in extracurricular activities (Meeuwisse, Severiens, & Born, 2010). The theory of retention involves integration and interaction which is the underlying foundation leading to the persistence of students which is what makes LLCs so effective (Spann & Tinto, 1990).

**Effectiveness.** Spann and Tinto (1990) state that retention programs have three effective principles: commitment to their students, which is the responsibility of the entire institution; commitment to social and intellectual growth of all students; and involvement and community, which stresses how their actions help integrate students into the social and intellectual mainstream of the institution. To ensure that students stay at the institution retention programs develop educational commitment that students are attracted to, while proactively addressing the students learning needs (MacGregor & Smith, 2005; Spann & Tinto, 1990). They also put great emphasis on student-faculty contact and the development of supportive communities. What makes LLCs effective is that they do not leave learning to chance. They have in place effective interventions: summer bridge programs (SBPs), mandated assessment, required placement in developmental courses, mandatory developmental advising, and freshman seminars. LLCs are concerned about the first year transition of students so they carefully monitor academic progress and provide regular feedback within the first six weeks of the semester (Spann & Tinto, 1990).

Successful and sustainable learning communities are those that depend on leaders from throughout the campus, investing in faculty and staff development, educators who are willing to change as they ask students to change, understanding that the emotional side of change matters, having the perspective and support of allies and mentors, and continuous rethinking and reintervention (MacGregor & Smith, 2005). It is not what these programs do that makes them so effective and successful but how they do it (Spann

& Tinto, 1990). One critical product of these programs is how they develop a student's sense of community and sense of belonging.

### **Sense of Community and Sense of Belonging**

Spanierman et al. (2013) claim that a sense of community and a sense of belonging are linked to the positive performance of undergraduates. According to Berger (1997), Tinto asserts that all institutions of higher education have numerous communities, that can be an avenue by which students can become integrated. A community is defined by Astin (1984) as a small subgroup of students with a common sense of purpose that builds a sense of group identity, togetherness, and uniqueness. A sense of community has four components: membership, influence, integration and fulfillment of needs, and shared emotional connection; along with four essential principles: involvement, investment, influence, and identity (Berger, 1997). Living on campus has a positive impact on student persistence and ultimately retention (Berger, 1997; Hausmann, Ye, Schofield, & Woods 2009).

The climate and culture that an institution fosters impacts the outcomes of students (Hurtado & Carter, 1997; Meeuwisse, Severiens, & Born, 2010). The role of the institution is to create an opening, welcoming, and accepting environment for students to improve retention (Meeuwisse, Severiens, & Born, 2010; O'Keeffe, 2013). The student population who did not fit in, felt that their social and cultural behaviors were unacceptable, and that their knowledge was not valued were more likely to drop out early (O'Keeffe, 2013; Zepke, Leach, & Prebble, 2006). Perception of a hostile climate and

cultural environment directly impacts minority students sense of belonging and thus their academic performance. One of the many reasons why minority students drop-out of college early is because they do not feel like they belong (Meeuwisse, Severiens, & Born, 2010). Having a sense of belonging is critical for minority students (Meeuwisse, Severiens, & Born, 2010; O’Keeffee, 2013).

Meeuwisse, Severiens, and Born (2010) state that minority students are reported to feel less at home in educational programs. Hispanic students specifically felt a disconnection with their campus. Studies on how minority students fit with their institution and the degree of academic rigor reported that the presence of similar students like themselves were not enough to make them comfortable and develop a sense of belonging (Meeuwisse, Severiens, & Born, 2010; O’Keeffee, 2013 ). Students, who history shows have little experience in higher education, felt distant from the academic culture and may lack the support system needed to complete their education. Zepke and Leach (2005) reported that students felt like they did not belong because of the following factors: feeling homesick, lack of social skills, inability to make friends, and feeling alienated from others.

The development of a sense of belonging is linked to interactions, the learning environment, and degree of involvement (Hausmann, Ye, Schofield, & Woods, 2009; Hurtado & Carter, 1997; Meeuwisse, Severiens, & Born, 2010; O’Keeffee, 2013). Positive faculty and peer interaction influences students’ sense of belonging by providing a supportive social and academic environment; thus, subsequently keeping students from

leaving (Meeuwisse, Severiens, & Born, 2010; O’Keeffe, 2013). For learning environments to promote retention they have to adjust to the diversity of the students, both in their needs and backgrounds (Meeuwisse, Severiens, & Born, 2010). The disconnect stems from the lack of feedback from academic professionals and the integration between students and the out-of-classroom experiences that increases the risk of students withdrawing, which is one of the many challenges that institutions are facing (O’Keeffe, 2013).

### **Challenges of Living-Learning Communities**

Smith (2001) describes four challenges that learning communities face and could cause these programs to be ineffective. In the first challenge, student learning and faculty development, institutions are under-investing in the development of faculty and need to create more effective ways of incorporating student learning into living-learning communities. In the second challenge, the challenge of diversity deals with who participates (students & faculty), where are classes held, what does the curriculum look like, and what is the structure and teaching of LLCs. The third challenge, the challenge of institutional change, LLCs must be able to transition from innovation to reform to ensure that they are receiving the appropriate support. Some of the weaknesses associated with institutional change include: leadership structure, resource investment, faculty development, real curriculum integration, assessment, and pedagogical change (Smith, 2001; Spann & Tinto, 1990). The fourth challenge, purpose, questions whether the goals of the program are known, whether the vision is large enough to keep up with the

increasing expansion of LLCs and how the quality will be strengthened and maintained. These programs are at the crossroads, both nationally and institutionally, and the concern is how to better organize them to gain the desired and appropriate support at a time when the entire educational system is being scrutinized by the public (Smith, 2001).

### **Relevant Studies**

Flynn (2012) conducted a study at Rowan University investigating the impact of the Engineering Living and Learning Community (ELLC) on freshmen engineering students by comparing it to non-ELLC participant experiences. There were 25 ELLC students, 22 students responded, yielding a response rate of 88%. The profile of the survey sample for ELLC students included: 17 (77%) males and 5 (23%) female students out of 22 total students who replied to the survey. The demographic profile included: 18 (82%) students identified as Caucasian, two (9%) identified as Asian/Pacific Islander, and two (9%) identified as Hispanic/Latino. There were 175 non-ELLC students, 159 students responded, yielding a response rate of 91%. The profile of the survey sample for non-ELLC students included: 136 (85.5%) male students and 23 (14.5%) female students. The demographic profile included: 140 (88%) students identified as Caucasian, seven (4%) identified as Asian/Pacific Islander, four (3%) identified as Black/African American, one (0.6%) identified as Native American, one (0.6%) identified as Hispanic/Latino, and six (4%) identified as other (Flynn, 2012).

The study used a mixed method design, employing a survey and a focus group (Flynn, 2012). Using factor grouping the survey results indicated that 91% of ELLC

participants had a strong sense of community, 77% felt apart of the engineering department, 86% reported a sense of belonging, and 82% noted positive social adjustment. Additionally, 100% of ELLC students considered their peers friends and 96% spent time out of the classroom with those peers. Of the non-ELLC students, 75% reported that it was easy for them to adjust to college socially and 80% reported that the requirements for their major were clear and reasonable (Flynn, 2012). However, 55% reported it was easy for them to adjust to college academically, 68% reported being included in the engineering department, and 66% reported like they were part of the engineering community. About 66% reported being familiar with campus resources, 50% reported that there were adequate services to help with career planning, and 47% reported there were a sufficient number of weekend activities for students, while 41% were neutral, and 12% disagreed with the statement. Seventy-seven percent of the non-ELLC students reported that it was an enjoyable experience to be a student on campus, 75% reported that they were made to feel welcome on campus, 73% reported a sense of belonging at Rowan University, while only 59% reported a sense of pride about their campus. Lastly, 62% non-ELLC students reported that they generally knew what was happening on campus (Flynn, 2012).

Flynn (2012) reported 90% of non-ELLC students considered some students in their major to be their friends, 81% reported that they spent time with classmates outside of class, 80% reported that it was easy to meet people and make friends, and 72% reported that they had a network of supportive peers in their major. Additionally, 70% reported it was easy to make friends with students in their major and with students



outside of their major, 62% reported that they had built strong relationships with peers in the College of Engineering, and 52% reported that they often studied with other students in their major (Flynn, 2012).

The study also evaluated student satisfaction, a total of 88% of non-ELLC students reported that they were satisfied with their experience in engineering, 84% reported that they were satisfied with their choice of major and with their experience at Rowan University overall. Furthermore, 91% reported that they intend to continue their education in engineering, and 89% reported that they intend to continue their education at Rowan. Lastly, 87% reported that they were confident in their ability to complete their degree (Flynn, 2012).

The second part of the research study was conducted through the use of a focus group. When asked why ELLC participants get involved four themes emerged: wanting something to do, to make connections, to build a resume, and to network and make friends (Flynn, 2012). The results from the focus group revealed that 68% of non-ELLC participants felt included, 55% thought the adjustment was easy, 77% felt a sense of connectedness, and 73% felt a sense of belonging. The transition from high school to college for non-ELLC participants was mixed. When asked why non-ELLC participants got involved, four themes emerged: meet people and make friends, have something fun to do, wanted to be part of something, and wanted to play a sport. In regards to non-ELLC relationships in their major, three themes emerged: the first theme, we do homework/ study/help each other with class work, was stated 70 times, the second theme, I only a

few friends, if any at all in their major, was stated 38 times, and the last theme, I had a lot of good friends in their major, was stated 35 times. Non-ELLC students reported the following as the most satisfying aspects of their engineering experience: getting hands-on experience, meeting people and making friends, the classes, passing the classes, and teachers. In addition, students reported the following as the least satisfying aspects of their engineering experience: the heavy workload and difficulty of the work, poor instruction and teachers, chemistry, classes and scheduling, classmates and ability to make friends, and not passing the classes (Flynn, 2012).

In regard to the ELLC participants satisfaction, students reported an ability to make friends, academic benefits, living together, and social activities as the most satisfying aspects of their engineering experience (Flynn, 2012). On the other hand, the ELLC participants reported the following as the least satisfying aspects of their engineering experience: living together, lack of diversity, activities, freshmen engineering clinic, and working together. There were some overlapping themes between the most and least satisfying aspects. Students commented that sometime living together and seeing each other all the time caused some conflict. Students made some recommendations that would hopefully improve the engineering living and learning experience at Rowan University (Flynn, 2012).

Zobel (2011) conducted a similar study at Rowan University, a medium-sized public suburban institution. The ELLC in this study consisted of financially needy students, with a concentration of students from groups underrepresented in STEM. The

first step was to organize a pilot group, that resulted in 91% of ELLC participants feeling connected to their university campus, 82% strongly agreeing or agreeing that the ELLC helped them adjust to academic rigor, and 68% agreeing that the ELLC helped ease their transition from high school to college.

Barrie (2016) conducted a study at Rowan University investigating how participating in a Mathematics Learning Community (MLC) impacted first-year students' experience in college. The purpose of this study was to identify the practices and activities that the Mathematics Learning Community (MLC) at Rowan University uses and how the Mathematics Learning Community (MLC) positively affected the students in the following ways: persistence within the mathematics major; Grade Point Average (GPA); social and academic integration into the university; and preparation for the rest of their career at Rowan University. There was a total population of 40 freshmen students enrolled in the 2015-2016 academic year, 36 students responded, yielding a response rate of 90% and five students volunteered to be interviewed. The profile of the survey sample for MLC students included: 22 (61%) males and 14 (39%) female students out of 36 total students who replied to the survey. The demographic profile included: 28 (79%) students identified as Caucasian, three (8%) Black/African American, two (6%) identified as Asian/Pacific Islander, and three (8%) identified as Hispanic/Latino.

The study used a mixed method of quantitative and qualitative measures. Using factor grouping the survey results indicated that 83% of MLC participants agreed that tutoring service is readily available, 81% reported an ease in transition from high school

to college socially, 69% reported that the requirements for the major are clear and reasonable, 69% agreed that there are sufficient number of weekend activities on campus, 53% reported they felt included in the Math Department, and 68% reported it was easy for them to adjust to college academically (Barrie, 2016). Additionally, 92% of MLC participants reported that they are made to feel welcome on Rowan's campus, 83% reported a sense of belonging at Rowan University, and 89% reported it is an enjoyable experience to be a student on this campus. Conversely, 58% reported there are an adequate number of services to help with career planning, and that they know how to get involved in campus organizations, 53% reported that they felt like a part of the math community, and 67% reported they generally know what is happening on campus. About 81% of MLC participants considered some students in their major to be their friend, 78% reported that they spent time with classmates outside of class, 67% reported that it was easy to make friends with students outside of their major, 67% reported that they were easily able to meet and make friends, 69% reported that they had a network of supportive peers in the major, and 75% reported that they had a network of supportive peers in the major. Conversely, 53% of MLC students reported that they often studied with other students and 58% reported that they built strong relationships with peers in the College of Mathematics.

Barrie (2016) reported 83% of MLC participants felt comfortable speaking in class, 83% reported that faculty were usually available after class or during office hours, 70% reported that faculty were fair and unbiased in their treatment of individual students, 69% reported felt comfortable asking questions in class, and 64% reported that the

quality of instruction received in most of the classes was excellent. Additionally, 53% reported that they felt comfortable approaching their teachers outside of class, 56% reported that their teachers cared about them as an individual, 44% reported that faculty took into consideration student differences as they teach a course, and 33% reported that they interacted with their teachers outside of the classroom. About 86% of MLC participants intended to continue their education at Rowan University, 89% reported that they intended to continue their education in math, 83% reported that overall they were satisfied with their experience at Rowan, 89% reported being confident in their ability to complete their degree, 75% reported that they were satisfied in their choice of major, and 83% reported that they were satisfied with their experience in the math department.

The second part of the research study was conducted through the use of a focus group. Content analysis was used to determine the common themes and subthemes, which were then arranged and ranked highest to lowest (Barrie, 2016). When asked about the most satisfying and least satisfying aspect of participating in the MLC three out of five students reported being very satisfied, and two were satisfied. For the most satisfying four themes emerged: making friends in class, academic, office hours, and MLC class. For the least satisfying four themes emerged: no social activities, community, no real professor connection, and MLC class. When asked what recommendations could be made to improve the learning community three themes emerged: improve the social activities, change some aspects of the MLC class, and incorporate more classwork during class time.

Marquard (2014) conducted a quantitative, quasi-experimental design study that focused on determining the effects that a flipped classroom environment had on students' attitude towards engineering and self-efficacy towards their ability to succeed and excel in the engineering program. A flipped classroom is a collaborative learning pedagogy that reverses the typical classroom schedule. This allowed instructors to use various learning styles to accommodate the diversified learning needs of the students. Through the use of surveys and the use of a control and a treatment group, the results of the study concluded that there was no significant changes with the treatment group however there was a significant difference between the two groups and coping self-efficacy. For the treatment group, the coping self-efficacy score rose from 5.65 to 5.89 while the control group score went from 6.06 to 5.89. This could be due to disengagement that is more common to occur in a lecture-oriented classroom than collaborative classrooms that leads to poor coping skills. An interesting finding was that the control group spent less time studying than the treatment group (Marquard, 2014).

Micomonaco (2011) examined the effect of living-learning communities (LLC) on disciplinary retention and learning outcomes in engineering education. The differences between LLC and non-LLC participants were noticed in the demographics, the process of selecting engineering as a major, and expectations. LLC participants demonstrated three significant advantages on three measures: commitment to engineering, connection to the College of Engineering, and connection to engineering peers. The retention rate for LLC participants was 85.1% compared to 76.1% for non-participants. The results showed that the LLC and non-LLC participants differed by gender and ethnicity and how there was a

positive sense of belonging connected to peers and the college of engineering but not to faculty.

### **Summary of the Literature Review**

This literature review provides a foundation of knowledge about living-learning communities (LLCs). LLCs have become a national movement and have taken hold because of their flexibility, strong links between disciplines and divisions, and the opportunity for faculty, staff, and students to development in positive ways (MacGregor & Smith, 2005). There are many different types of LLCs including: linked courses, freshman interest groups, cluster courses, and coordinated courses with three thematic groups: transition programs, academic honors programs, and curriculum-based programs (Inkelas & Weisman, 2003; Tinto, 2003). The structure and design of these communities has fostered an environment where students are able to integrate comfortably and develop a sense of community and belonging to the institution, find positive impact on academic performance, and help address students' diverse needs (Astin, 1999; Hausmann, 2009; Inkelas & Weisman, 2003; MacGregor & Smith, 2005; Meeuwisse et al., 2010; O'Keeffe, 2013; Spann & Tinto, 1990; Tinto, 1996, 1998, 1999). Ultimately, when students successfully integrate into the collegiate environment they are more likely to persist and graduate (Tinto, 1996, 1998, 1999, 2003).

Student involvement is very critical to retention and though there has been an increase in college graduation rates, the retention rates of engineering students remain low (Marquard, 2014). There are many reasons why students leave college but

engineering students leave because of inadequate teaching and advising, lack of community, heavy workload, lack of support and sense of belonging from faculty and administration, disconnection between what is taught and what engineers actually do, and the competitive culture (Marquard, 2014; Meeuwisse et al., 2010; O’Keeffee, 2013; Spanierman et al., 2013; Spann & Tinto, 1990; Tinto, 2003). However, research has depicted that LLCs have a positive influence on both the students and the institution.

LLCs face four major challenges: student learning and faculty development, diversity, institutional change, and purpose (Smith, 2001). It is important that these programs are aware of these challenges and make the necessary changes in order to be effective and successful. Different institutions have varying LLCs that function specifically to meet the needs of their institutional profile. However, similar studies have found the positive effects on engineering living-learning communities on student overall satisfaction, connectedness to the institution and the department, positive student-faculty relationship, positive peer interaction, improved academic performance, increased involvement, and smoother transition from a high school to a collegiate environment (Flynn, 2012; Marquard, 2014; Micomonaco, 2011; Zobel, 2011). Studies conducted within other academic themed learning communities, such as the Math Learning Community (MLC) also found positive effects on student overall satisfaction (Barrie, 2016).

Living-learning communities are effective and innovative prevention programs that integrate the in and out-of-classroom experiences. The history of these programs



have established a strong foundational knowledge base. Research has shown that LLCs have a positive impact on students academics, involvement, and retention. Most of the literature on living-learning communities examines students' environment, academic, social development, and transition to college. However, there is a lack of research and a gap in the knowledge base on the impact and influence of student workers on student academic performance, involvement, connectedness, and interactions. Research has suggested that more in-depth knowledge needs to be obtained on the attainment, progression, involvement, development, and experiences of engineering students (Housee, 2011). This study examines and evaluates the impact that living-learning communities have on freshmen Engineering Learning Community students.

## Chapter III

### Methodology

#### Context of the Study

The study was conducted at Rowan University, in Glassboro New Jersey. Rowan University is a medium-sized, public state comprehensive research institution of higher education. The student enrollment population at Rowan University consists of 16,155 students: 13,169 undergraduate students, 2,078 graduate students, and 908 professionals from 33 states and 19 foreign countries, with a minority enrollment at 28%. About 4,483 students reside in 14 of residential halls with a variety of living and learning communities and four apartment buildings. Freshman students are required to live on campus, while other students are given housing based on a first come, first serve basis. Rowan University ranked by the *U.S. News & World Report* in the 2016 Best Colleges listing as #19 among Best Regional Universities–North out of 131 schools and #3 among public institutions in its category (Rowan University, 2015).

The University's Henry M. Rowan College of Engineering undergraduate programs improved their rank to #28 in 2015 *U.S. News & World Report* study, tying with four other institutions out of 214 (Rowan University, 2015). The college has six majors; including biomedical, chemical, civil and environmental, electrical and computer, engineering entrepreneurship, and mechanical. Additionally, the college has three graduate programs, Master of Science in Engineering (MSE) and Master of Engineering Management (MEM), and Doctorate in Engineering. The Master of Science in

Engineering (MSE) has six specializations; including chemical, civil, electrical and computer, engineering management, environmental, and mechanical (Rowan University, 2016a). There are 79 faculty and staff working in the the College of Engineering.

According to Dr. Everett (personal communication, September 14, 2016), the Engineering Learning Community (ELC) is a first-year residential and curricular program for engineering students, and is supported by two National Science Foundation (NSF) Scholarship in Science, Technology, Engineering, and Mathematics-STEM) Grants (2009-2014 & 2015-2020). The purpose of the ELC is not only to provide scholarships to engineering students, but to also improve diversity by attracting underrepresented students, ease the transition from high school to college, and improve STEM communication and technical skills through the Rowan Engineering Clinic Program. In 2009-2010 and 2010-2011, there were one scholarship cohort of about 22 students that received a \$3,000 four year scholarship. Between 2012-2014 there was one non-scholarship cohort of 25 students. In 2015 there was three sections: one scholarship (15 students, \$5,000 per year for four years) and two non-scholarship (about 25 students). In 2016 the sections has increased to six: one scholarship cohort (15 students, \$5,000 per year four year scholarships) and five non-scholarship (about 24 students in each section). In addition, this current program has six student workers (former ELC students) that work hand-in-hand with the ELC Seminar professors (Rowan University, 2016b).

Students in the ELC live in the same dormitory, take two classes together each of their first two semesters at Rowan University, and participate in the ELC Seminar

(Rowan University, 2016b). The common classes ELC students take include: Freshman Engineering Clinic I & Chemistry I in the Fall and FEC II & Introduction to Mechanics in the Spring. The ELC Seminar is a zero-credit course and activities range from social to academic.

### **Population and Sample Selection**

The target population for this study was all the students enrolled in the Engineering Living-Learning Community from the College of Engineering. The College of Engineering had about 135 freshmen in the ELC in the fall of 2016. A total population of students enrolled in the ELC at Rowan University was used. With the Director of the Engineering Learning Community's permission, I was able to visit all six freshman seminar sections and administer and collect surveys from the ELC students. In addition to the survey sample, one focus group was conducted with the five ELC participants who were purposively selected to represent diverse experiences within the program.

### **Instrumentation**

Research in this study was conducted in two phases. In the first phase, a survey was administered to the freshmen engineering students enrolled in the ELC Seminar class. Some of the survey questions (Appendix D) came directly from Flynn (2012). Permission was granted by Flynn to use her instrumentation in conducting this research study (Appendix B). The survey instrumentation was adapted and altered so the questions reflected the influence of student workers. Flynn (2012) developed her survey based on a survey done by Damminger (2004) for undeclared freshmen learning community

participants and by Zobel's (2011) survey for freshmen engineering living-learning community students. The survey instrument consists of 8 demographic questions, 45 Likert scale items measuring students' level of agreement, two yes or no questions, and eight open-ended questions. The value of the Likert scale include: 1-strongly disagree, 2-disagree, 3-neutral, 4-agree, and 5-strongly agree. The instrument was field tested on several graduate students, two undergraduate engineering students who were previous members of the ELC, and by one engineering faculty member to verify validity and reliability, and to get an estimate of the time it took to complete the survey. The results showed that it took about eleven minutes to complete. A Cronbach Alpha was calculated for Likert Scale items 9-53 of the survey instrument to test for internal consistency and reliability. If an Alpha coefficient results show a value of .70 or greater it is considered internally consistent or a reliable instrument. After running the Cronbach Alpha test on these items in SPSS the Alpha coefficient resulted in .958, meaning the survey instrument is considered reliable.

The second phase of the study was conducted and gathered qualitative data through two hour long focus group discussions. The focus group questions (Appendix G) came directly from Zobel (2011). There are 12 open-ended questions that addresses impact broken down into three sections each with four questions: ELC experience, University experience, and student worker experience. The questions were reviewed by a current engineering faculty member and by former ELC participants. Participants signed consent forms, and were notified that their responses would be used solely for data collection in this study, and that, to ensure confidentiality, their names would not be used.

Participants also had the option to skip questions if they did not feel comfortable answering.

### **Data Collection**

Prior to the collection of any data, an electronic Institutional Research Board (eIRB) application (Appendix A) was completed and approved. All participants completed and submitted informed consent. The students who received the survey were all those who participated in the Engineering Living-learning community. Individuals who meet the profile to participate in this survey were asked to agree to an alternative consent (Appendix C) and then take the student survey (Appendix D) to gather data. For the focus group, five students volunteered to participate in the focus group interview after everyone completed the survey. Participants signed a consent form and an audio consent form (Appendices E and F). As the questions were asked, each participant was given a chance to answer. Notes were taken during the discussion and the conversation was later transcribed.

### **Data Analysis**

The surveys were analyzed using descriptive statistics (frequencies, percentages, means, and standard deviations) of questions related to ELC student connectedness to campus, peer relationships, interactions with faculty, and their overall satisfaction with engineering and Rowan University, using the Statistical Package for the Social Sciences (SPSS) computer program. Each open-ended question was transcribed, color-coded, and analyzed, linking similar responses to show common themes (Appendix D). Additionally,

the focus group discussion was transcribed, analyzed, and color-coded to connect similar answers and find patterns in their responses. The focus group content was analyzed using Sisco (1981) rules and procedures for logical analysis of written data, looking for common and divergent themes based upon participants responses (Appendix H).

## **Chapter IV**

### **Findings**

The findings are divided into two sections because this study used a mixed method approach, the first section displays the profile of the survey sample and lays out the data gathered from the survey. The second section reports results of the focus group interview organized into meaningful themes based upon content analysis.

#### **Profile of the Survey Subjects**

This study consisted of a total population of the ELC members during the 2016-2017 academic year at Rowan University at the Glassboro campus in New Jersey. In the fall 2016 semester 135 students were involved in the ELC Seminar. In the spring semester, 127 students were enrolled in the ELC Seminar, and 69 students completed the survey yielding a 54% response rate. The low response rate can also be due to the fact that some ELC students either changed their majors from something other than engineering or that they dropped out of the program. In addition, there was a drop in attendance for the ELC Seminars in the spring semester.

Table 4.1 displays the demographic information collected, of the 69 students, 46 (66.7%) were male students, 22 (31.9%) were female students, and one (1.4%) as other. There were 58 (84.1%) students who identified as White/Caucasian, two (2.9%) who identified as Black/African American, two (2.9%) who identified as Hispanic/Latino, and six (8.7%) who identified as Asian/Pacific Islander, and one (1.4%) who identified as



Native American. The participants were asked about their high school GPA out of 4 or 5 points, the results showed that 21 (30.4%) reported having a 4.0 or higher, 39 (56.5%) reported having between a 3.5-4.0, nine (13.0%) reported having between a 3.0-3.5. The participants were asked about their engineering major, the results showed that seven (10.1%) reported majoring in biomedical, 16 (23.2%) reported majoring in chemical, 13 (18.8%) reported majoring in civil and environmental, 13 (18.8%) reported majoring in electrical and computer, and 20 (29.0%) reported majoring in mechanical. The data show that 11 (15.9%) answered yes to having at least one parent who is an engineer and 58 (84.1%) answered no.

Table 4.1

*Demographics of ELC (N=69)*

Category	Sub-category	<i>f</i>	%
Gender	Male	46	66.7
	Female	22	31.9
	Other	1	1.4
Ethnicity	Black/African American	2	2.9
	Asian/Pacific Islander	6	8.7
	Native American	1	1.4
	White/Caucasian	58	84.1
	Hispanic/Latino	2	2.9
High School GPA	4.0 +	21	30.4
	3.5-4.0	39	56.5
	3.0-3.5	9	13.0

Table 4.1 (continued)

Category	Sub-category	<i>f</i>	%
Engineering Major	Biomedical	7	10.1
	Chemical	16	23.2
	Civil & Environmental	13	18.8
	Electrical & Computer	13	18.8
	Mechanical	20	29.0

### Analysis of the Survey Data

**Research question 1.** How do ELC students report their transition and sense of community and belonging to Rowan University and the College of Engineering?

Table 4.2 displays the information about the ELC students response regarding their transition to Rowan University. Statements are arranged from most to least positive using the mean scores and presented in factor grouping based on transition to Rowan University. Based on the top two mean scores, 92.8% of ELC students reported that they strongly agreed or agreed that the requirements for their major were clear and reasonable, and 87% of ELC students reported that they strongly agreed or agreed that they felt a part of the engineering community. However, 76.8% of ELC students reported that they strongly agreed or agreed that it was easy for them to adjust to college academically and 68.1% reported that they strongly agreed or agreed that there were a sufficient number of weekend activities for students.

Table 4.2

*ELC Response to Transitioning to Rowan University (N=69)*  
*(Strongly Agree=5, Agree=4, Neutral=3, Disagree=2, Strongly Disagree=1)*

Statement	Strongly Agree		Agree		Neutral		Disagree		Strongly Disagree	
	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%
The requirements for my major are clear and reasonable. <i>M</i> =4.43, <i>SD</i> =.675	36	52.2	28	40.6	4	5.8	1	1.4		
I feel like I am part of the engineering community. <i>M</i> =4.39, <i>SD</i> =.808	38	55.1	22	31.9	8	11.6	1	1.4		
I feel included in the engineering department. <i>M</i> =4.36, <i>SD</i> =.568	28	40.6	38	55.1	3	4.3				
I know how to get involved in campus organizations. <i>M</i> =4.30, <i>SD</i> =.792	31	44.9	31	44.9	5	7.2	1	1.4	1	1.4
Tutoring services are readily available. <i>M</i> =4.26, <i>SD</i> =.678	26	37.7	36	52.2	6	8.7	1	1.4		
There are adequate services to help me with career planning. <i>M</i> =4.20, <i>SD</i> =.759	27	39.1	30	43.5	11	15.9	1	1.4		
It was easy for me to adjust to college socially. <i>M</i> =4.09, <i>SD</i> =.919	24	34.8	33	47.8	8	11.6	2	2.9	2	2.9
It was easy for me to adjust to college academically. <i>M</i> =4.06, <i>SD</i> =1.056	29	42.0	24	34.8	9	13.0	5	7.2	2	2.9

Table 4.2 (continued)

Statement	Strongly Agree		Agree		Neutral		Disagree		Strongly Disagree	
	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%
	There are a sufficient number of weekend activities for students. <i>M</i> =3.88, <i>SD</i> =1.022	22	31.9	25	36.2	16	23.2	4	5.8	2

Table 4.3 shows ELC students' responses regarding their connectedness to the university. Statements are arranged from most to least positive using the mean scores and presented in factor grouping based on connectedness to Rowan University. The top statements based on the mean scores showed that 92.8% of ELC students reported that they strongly agreed or agreed that the students were made to feel welcomed on Rowan's campus and 91.3% reported that they strongly agreed or agreed that they had an enjoyable experience on campus. Conversely, the lowest mean score factor grouping at 81.2% of ELC students indicated that they strongly agreed or agreed that they generally knew what was happening on campus.

Table 4.3

*ELC Response to Connectedness to Rowan University (N=69)*  
*(Strongly Agree=5, Agree=4, Neutral=3, Disagree=2, Strongly Disagree=1)*

Statement	Strongly Agree		Agree		Neutral		Disagree		Strongly Disagree	
	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%
Students are made to feel welcome on this campus. <i>M=4.38, SD=.666</i>	32	46.4	32	46.4	4	5.8	1	1.4		
It is an enjoyable experience to be a student on this campus. <i>M=4.37, SD=.731</i>	32	46.4	31	44.9	4	5.8	1	1.4		
I feel a sense of belonging at Rowan University. <i>M=4.35, SD=.744</i>	33	47.8	29	42.0	5	7.2	2	2.9		
I feel a sense of belonging about my campus. <i>M=4.32, SD=.757</i>	31	44.9	31	44.9	6	8.7	1	1.4		
I generally know what's happening on campus. <i>M=4.10, SD=.770</i>	22	31.9	34	49.3	11	15.9	2	2.9		

In addition to the quantitative data, the open-ended survey questions, shown in Table 4.4 revealed three themes regarding the ELC students' transition from high school to college. The first theme, stated 52 times, showed that their transition from high school to college was easy. The second theme, stated 13 times, indicated that some ELC students

had a harder time transitioning to the heavy workload. The last theme, stated three times, was that it was harder transitioning socially.

Table 4.4

*Themes Describing ELC Transition from High School to College*

Theme	Frequency	Rank
Easy - prepared and comfortable	52 times stated	1
Harder	13 times stated	2
Harder, socially	3 times stated	3

The qualitative data from the open-ended survey questions revealed four themes describing why ELC students decided to get involved at Rowan University, as shown in Table 4.5. The first theme that emerged, stated 23 times, was that they wanted to network and make connections. The second theme, stated 18 times, was that ELC students wanted to socialize. The third theme, states nine times, was that they wanted to be able to build their resume. The last theme, stated four times, was that ELC students wanted something to do. Forty-seven (89%) students reported that they were involved on campus, while six (11%) reported that they were not involved on campus.

Table 4.5

*Themes Describing Why ELC Students Decided to Get Involved*

Theme	Frequency	Rank
To network and make connections	23 times stated	1
Socialize	18 times stated	2
To build resume	9 times stated	3
To do something	4 times stated	4

**Research question 2.** How do ELC students report their level of interactions with peers and faculty at Rowan University and with the College of Engineering?

Table 4.6 shows ELC students' responses regarding their peer interaction. Statements are arranged from most to least positive using the mean scores and presented in factor grouping based on peer interaction. Regarding peer interaction, 95.6% of ELC students indicated that they strongly agreed or agreed that they considered some students in their major to be their friends, and 87% of ELC students reported that they strongly agreed or agreed that they spent time with classmates outside of class. Conversely, 65.2% indicated that they strongly agreed or agreed that it was easy to make friends with students outside of their major. Lastly, 63.7% indicated that they often studied with students in their major, while 24.6% chose neutral, and 11.5% indicated that they disagreed or strongly disagreed with the statement.

Table 4.6

*ELC Response to Peer Interaction (N=69)*  
*(Strongly Agree=5, Agree=4, Neutral=3, Disagree=2, Strongly Disagree=1)*

Statement	Strongly Agree		Agree		Neutral		Disagree		Strongly Disagree	
	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%
I consider some students in my major to be my friends. <i>M</i> =4.62, <i>SD</i> =.568	47	68.1	19	27.5	3	4.3				
I spend time with classmates outside of class. <i>M</i> =4.48, <i>SD</i> =.720	42	60.9	18	26.1	9	13.0				
It is easy to make friends with students in my major. <i>M</i> =4.33, <i>SD</i> =.852	36	52.2	23	33.3	8	11.6	1	1.4	1	1.4
I have built strong relationships with peers in the College of Engineering. <i>M</i> =4.26, <i>SD</i> =.934	36	52.2	19	27.5	11	15.9	2	2.9	1	1.4
I was easily able to meet people and make friends. <i>M</i> =4.26, <i>SD</i> =.885	33	47.8	25	36.2	8	11.6	2	2.9	1	1.4
I have a network of supportive peers in my major. <i>M</i> =4.26, <i>SD</i> =.825	30	43.5	28	40.6	8	11.6	3	4.3		
I often study with other students in my major. <i>M</i> =3.90, <i>SD</i> =1.165	29	42.0	16	23.2	14	20.3	8	11.6	2	2.9



Table 4.6 (continued)

Statement	Strongly Agree		Agree		Neutral		Disagree		Strongly Disagree	
	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%
It is easy to make friends with students outside of my major. <i>M</i> =3.87, <i>SD</i> =1.070	25	36.2	19	27.5	17	24.6	7	10.1	1	1.4

Table 4.7 shows ELC students' responses regarding their faculty interaction. Statements are arranged from most to least positive using the mean scores and presented in factor grouping based on student-faculty interaction. In regards, to student-faculty interaction, 91.3% of ELC students reported that they strongly agreed or agreed that faculty were usually available after class or during office hours, and 85.5% indicated that they strongly agreed or agreed that faculty were fair and unbiased in their treatment of individual students. However, 55.1% of ELC students reported that they strongly agreed or agreed that faculty took student differences into consideration as they taught a course. Lastly, 20.2% of ELC students indicated that they strongly agreed or agreed that they interacted with teachers outside of the classroom, with 50.7% choosing neutral, and 28.9% reporting that they disagreed or strongly disagreed with the statement.

Table 4.7

*ELC Response to Faculty Interaction (N=69)*

*(Strongly Agree=5, Agree=4, Neutral=3, Disagree=2, Strongly Disagree=1)*

Statement	Strongly Agree		Agree		Neutral		Disagree		Strongly Disagree	
	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%
Faculty are usually available after class and during office hours. <i>M</i> =4.38, <i>SD</i> =.644	32	46.4	31	44.9	6	8.7				
Faculty are fair and unbiased in their treatment of individual students. <i>M</i> =4.25, <i>SD</i> =.736	28	40.6	31	44.9	9	13.0	1	1.4		
I feel comfortable speaking in class. <i>M</i> =4.07, <i>SD</i> =.913	27	39.1	23	33.3	17	24.6	1	1.4	1	1.4
I feel comfortable approaching my teachers outside of class. <i>M</i> =4.06, <i>SD</i> =.838	24	34.8	27	39.1	16	23.2	2	2.9		
I feel comfortable asking questions in class. <i>M</i> =4.04, <i>SD</i> =.882	26	37.7	22	31.9	19	27.5	2	2.9		
My professors care about me as an individual. <i>M</i> =3.93, <i>SD</i> =.863	19	27.5	29	42.0	19	27.5	1	1.4	1	1.4
The quality of instruction I receive in most of my <i>M</i> =3.71, <i>SD</i> =.893	12	17.4	31	44.9	22	31.9	2	2.9	2	2.9

Table 4.7 (continued)

Statement	Strongly Agree		Agree		Neutral		Disagree		Strongly Disagree	
	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%
Faculty take into consideration student differences as they teach a course. <i>M</i> =3.64, <i>SD</i> =1.029	16	23.2	22	31.9	23	33.3	6	8.7	2	2.9
I interact with my teachers outside of the classroom. <i>M</i> =2.91, <i>SD</i> =.966	5	7.2	9	13.0	35	50.7	15	21.7	5	7.2

For the ELC qualitative data, presented in Table 4.8, the first common theme describes how involvement within their major affected their relationship with professors so that it made it easier to build a relationship, stated 27 times. The second theme that emerged was that involvement had no effect at all, stated 16 times. Lastly, five ELC students stated that involvement made it easier for them to ask professors for help.

Table 4.8

*Themes Describing ELC Response to How Involvement within Their Major Effects Relationships with Professors*

Theme	Frequency	Rank
Easier to build relationship	27 times stated	1
No effect on the relationship	16 times stated	2
Easier to ask for help	5 times stated	3

**Research question 3.** What were the satisfaction level of students participating in the ELC?

Table 4.9 shows ELC students' responses regarding their level of satisfaction . Statements are arranged from most to least positive using the mean scores and presented in factor grouping based on satisfaction. The data showed that 95.6% of ELC students indicated that they strongly agreed or agreed that they intend to continue their education at Rowan University. Conversely, 85.5% of ELC students indicated that they strongly agreed or agreed that they are satisfied with their choice of major, 8.7% chose neutral, and 5.8% reported that they disagreed or strongly disagreed with the statement.

Table 4.9

*ELC Response to Being Satisfied at Rowan University and with the College of Engineering (N=69)*  
*(Strongly Agree=5, Agree=4, Neutral=3, Disagree=2, Strongly Disagree=1)*

Statement	Strongly Agree		Agree		Neutral		Disagree		Strongly Disagree	
	f	%	f	%	f	%	f	%	f	%
I intend to continue my education in engineering. <i>M=4.65, SD=.724</i>	51	73.9	15	21.7	1	1.4	1	1.4	1	1.4
I intend to continue my education at Rowan University. <i>M=4.61, SD=.691</i>	47	68.1	19	27.5	2	2.9	1	1.4		
I am confident in my ability to complete my degree. <i>M=4.48, SD=.720</i>	40	58.0	24	34.8	3	4.3	2	2.9		
Overall, I am satisfied with my experience at Rowan. <i>M=4.43, SD=.675</i>	36	52.2	28	40.6	4	5.8	1	1.4		
I am satisfied with my experience in engineering. <i>M=4.42, SD=.755</i>	37	53.6	26	37.7	5	7.2	1	1.4		
I am satisfied with my choice of major. <i>M=4.29, SD=.956</i>	36	52.2	23	33.3	6	8.7	2	2.9	2	2.9

The open-ended survey questions displayed four major themes, shown in Table 4.10, regarding what ELC students stated to be the most satisfying aspect of their experience at Rowan. The first theme was “learning,” which was stated 37 times. The second theme was making friends and developing a sense of community, which reoccurred 20 times. Getting involved was the third theme, stated seven times and the fourth theme was the professors and their accessibility, stated six times.

Table 4.10

*Themes Regarding What ELC Students Reported to be the Most Satisfying Aspect of Their Engineering Experience at Rowan*

Theme	Frequency	Rank
Learning	37 times stated	1
Friendship, sense of community	20 times stated	2
Clubs/Extracurricular activities	7 times stated	3
Professors, having access to them	6 times stated	4

Students were also asked to report what was least satisfying about their experience at Rowan. Three common themes emerged from this question, as shown in Table 4.11. The first theme was the heavy workload/curriculum, which was stated 29 times. The second theme, stated 15 times, was the quality of the professors and the last theme was nothing, stated 12 times. One student noted that he/she was unsatisfied with

the lack of school spirit and another student stated that he/she was unsatisfied with how difficult it is to change majors within engineering. Lastly, one student noted that he/she felt separated from the rest of the campus and another student stated he/she was unsatisfied with the fact that expectations are not generalized and that expectations are placed above a student's current ability.

Table 4.11

*Themes Regarding What ELC Students Reported to be the Least Satisfying Aspect of Their Engineering Experience at Rowan*

Theme	Frequency	Rank
Workload/Curriculum	29 times stated	1
Quality of Professors	15 times stated	2
None	12 times stated	3

**Research question 4.** What is the influence of ELC student workers on freshmen ELC students' GPA, retention, and feelings of connectedness toward the College of Engineering and Rowan University?

Table 4.12 shows ELC students' responses regarding student workers impact. Statements are arranged from most to least positive using the mean scores and presented in factor grouping based on the influence of student workers. The data showed that 60.8% of ELC students reported that they strongly agreed or agreed that the student workers

were helpful and that they are satisfied with the performance of student workers. Conversely, 39.1% of ELC students indicated that they strongly agreed or agreed that they consider the student workers as a friend. Lastly, 33.3% indicated that they strongly agreed or agreed that they interacted with the student workers, while 33.3% chose neutral, and 33.3% reported that they disagreed or strongly disagreed with the statement.

Table 4.12

*ELC Response to Student Worker Interaction (N=69)*  
*(Strongly Agree=5, Agree=4, Neutral=3, Disagree=2, Strongly Disagree=1)*

Statement	Strongly Agree		Agree		Neutral		Disagree		Strongly Disagree	
	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%
I am satisfied with student workers performance. <i>M</i> =3.87, <i>SD</i> =.839	19	27.5	23	33.3	26	37.7	1	1.4		
The student workers were helpful. <i>M</i> =3.83, <i>SD</i> =.907	19	27.5	23	33.3	23	33.3	4	5.8		
My student worker care about me as an individual. <i>M</i> =3.65, <i>SD</i> =.905	17	24.6	14	20.3	35	50.7	3	4.3		
The student workers care about me as an individual. <i>n</i> =68, <i>M</i> =3.57, <i>SD</i> =.886 Missing=1	12	17.4	21	30.4	29	42.0	6	8.7		
I feel comfortable approaching student workers outside of class. <i>M</i> =3.52, <i>SD</i> =1.009	14	20.3	19	27.5	26	37.7	9	13.0	1	1.4



Table 4.12 (continued)

Statement	Strongly Agree		Agree		Neutral		Disagree		Strongly Disagree	
	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%
I feel valued by the student workers. <i>M</i> =3.49, <i>SD</i> =.851	11	15.9	17	24.6	36	52.2	5	7.2		
I consider the student workers as a friend. <i>M</i> =3.39, <i>SD</i> =1.018	13	18.8	14	20.3	30	43.5	11	15.9	1	1.4
I interact with the student workers. <i>M</i> =3.04, <i>SD</i> =1.035	6	8.7	17	24.6	23	33.3	20	29.0	3	4.3

The qualitative data from the open-ended survey questions revealed four themes describing the impact of student workers on the ELC students' life, as shown in Table 4.13. The first theme that emerged, stated 31 times, was that student workers provided support. The second theme, stated 16 times, was that student workers had no impact on their life. The third theme, stated seven times, was that the student workers helped with their transition to college. The last theme, stated four times, was that ELC students did not know other student workers. Sixty-eight percent of students reported that they felt support from the student workers, while 21% reported that they did not feel support from the student workers.

Table 4.13

*Themes Regarding Student Worker Impact*

Theme	Frequency	Rank
Supportive	31 times stated	1
No impact	16 times stated	2
Helped with transition	7 times stated	3
Do not know other student workers	4 times stated	4

**Profile of the Focus Group**

Participation in the focus group interview was voluntary. The participants were provided a letter that pledged confidentiality and requested consent to participate in the focus group. All of the participants were freshman engineering learning community (ELC) students who lived on campus. All participants lived on campus in the Holly Pointe Commons residential hall on the same floor. There were five student participants, all five students identified as a Caucasian male. Two students were majoring in electrical and computer engineering, one student major was chemical engineering, one student major was civil and environmental engineering, and one student major was mechanical engineering. Three students reported having a 4.0 GPA in high school, one student reported having a GPA between 3.5 and 4.0 in high school, and one student reported having a GPA between a 3.0 and 3.5 in high school. During the focus group interview, two students reported having a 4.0 GPA, one student reported having a 3.5 GPA, one

student reported having a 3.2 GPA, and one student reported having a 2.88 GPA.

Furthermore, one participants reported to have at least one parent who is an engineer, while the other four participants reported having no parents in engineering.

The focus group interview lasted about a half an hour and was guided by collecting demographic information followed by asking 12 interview questions. Content analysis was used to determine the common themes and sub-themes. The themes and sub themes were arranged in rank order. Illustrated quotations are presented to highlight themes from the interview data.

### **Analysis of the Focus Group Data**

**Research question 5.** What do ELC students report about their experiences with the ELC, Rowan University, and student workers?

All five of the ELC focus group participants stated that they were satisfied with their overall ELC experience. Table 4.14 shows a list of most common themes regarding student satisfaction with the ELC program. Student's ability to make new friends was the most common theme that emerged. One student said, "ELC created an environment of people with similar interests." When asked about making friends with people outside of the ELC, participants said that is was harder to make friends with non-ELC students unless you already knew them. One student said, "You are so busy working on projects and studying it makes it hard to have time to interact with others outside of engineering." Another student said that because he already picked a roommate and does not live in the engineering community, he is able to connect with other students easier. The majority of

the participants, however, said they felt at home and comfortable simply being within the Engineering Learning Community (ELC).

Table 4.14

*Most Satisfying Aspects of ELC*

Theme	Subtheme	Frequency	Rank
Making friends	ELC made it easier Already knew people	18	1
Living together	Can ask your roommate for help Stay up and help each other	8	2
Academic	Resume building Studied together Ask for help Connection with faculty Same courses	7	3

Even though all of the participants claimed to be satisfied with their experience with the ELC, the focus group was not as satisfied with the social aspect of the ELC. The participants felt that there was no need for the some of the social activities and suggested that they should be doing something else beside just sitting in the classroom and talking. One participant suggested to improve the social activities by not having repetitive activities and have them spread throughout the semester. Additionally, participants reported being satisfied with the academic support that the ELC provides. One student said, “Being able to talk to your roommate or your neighbors and get help with

assignments was a positive.” All the participants said that since they were taking the same courses, it made it easier to form study groups to help and learn from one another.

However, there are some aspects of the ELC that the participants felt were less satisfying as shown in Table 4.15. Students noted that living together can some times be overwhelming and cause issues. One student said, “Being the last room at the end of the hall next to the history living learning community can be distracting due to them staying up all night studying.” Another student said, “It would be nice to have a roommate with a different major.” Some of the activities that the participants have to engage in are repetitive and are not needed. One student suggested not having so many activities and to get some input and thoughts from the current ELC students to make the activities more appealing and interesting to motivate students to come to class. Lastly, even though all the participants did not like the fact that the ELC Seminar is a non-credit class. The focus group participants suggested that meeting every other Friday during the first semester is great, but for the second semester there should be a monthly check-in to see how things are progressing.

Table 4.15

*Least Satisfying Aspects of ELC*

Theme	Subtheme	Frequency	Rank
Activities	No input on program Meeting every other Friday Repetitive program	12	1
Living together	Too close to other LLCs No non-ELC roommates No get away	4	2
Working together	Procrastination	2	3
ELC Seminar	Non credit course	2	3

Lastly, students felt that their overall Rowan University experience could be improved. All of the participants agreed that they made great connections with the faculty within the Engineering Learning Community (ELC). However, there is a lack of connections with other faculty outside of the ELC. They also reported not knowing the difference between ELC and non-ELC engineering peers. One student said, “We do not interact with those students.”

## **Chapter V**

### **Summary, Discussion, Conclusions, and Recommendations**

#### **Summary of the Study**

This thesis examined the impact that the Engineering Learning Community (ELC) had on freshman transition to college, their connectedness to the College of Engineering and Rowan University, their interactions between peers and faculty, and their overall satisfaction with the student workers. The subjects in this study were freshmen who were enrolled in the Engineering Learning Community (ELC) and completed their fall 2016 required courses from Rowan University main campus, Glassboro, NJ. The survey instrument (Appendix D) was adapted and altered so the questions reflected the influence of student workers. The focus group participants were freshman engineering students in the ELC. This study was conducted during the spring semester of 2017. Sixty-nine completed surveys were anonymously collected, yielding a return rate of 54%.

Demographic questions and Likert scale items were analyzed using SPSS to find descriptive statistics (frequency of responses, percentages, means, and standard deviations) were used to analyze the data from the completed surveys. Version 24 of the Statistical Package for the Social Sciences (SPSS) software was used. The focus group interview was designed to capture the participants' overall reflections about their ELC experience, University experience, and student worker experience. The interview data were analyzed using Sisco's (1981) rules and procedures for logical analysis of written

data, looking for common and divergent themes based upon participants responses (Appendix H).

### **Discussion of the Findings**

Living-learning communities (LLCs) are very beneficial and influential aspect of the collegiate experience. Studies have shown that institutions as a whole benefits from these LLCs including: students who perform high academically, increased retention rates, higher performing professors, and the incorporation of educational goals and objectives with the institution's mission (Tinto, 2003; Zhao & Kuh, 2004). According to Astin's (1984, 1999) student involvement theory the more students participate in other collegiate experiences beyond the classroom the more involved they become and engaged having a positive impact on their growth and development. Tinto's (1988) theory on student departure, clearly states that when students begin to socialize and establish a sense of community at an institution, like the ELC students have done, then they are considered integrated into the university. The transition from high school to college can be challenging, however when freshman students are able to easily make that transition they are more likely to stay and graduate, positively impacting retention rates.

**Research question 1.** How do ELC students report their transition and sense of community and belonging to Rowan University and the College of Engineering?

From the analysis of the surveys, the data show that ELC students had a smooth transition from high school to college. About 95.7% reported that they felt included in the engineering department and 89.9% reported that they know how to get involved on



campus and that tutoring services were readily available. Seventy-nine percent agreed that it was easy for them to adjust to college academically. Additionally, 41 (59.4%) of ELC students indicated in the open-ended questions that it was easy for them to transition, with 9 (13.0%) of the students indicating that the workload was harder and more time consuming, while two (2.9%) students felt the transition was hard socially. In Flynn's (2012) study of the ELLC, 90.9% reported that they felt included in the engineering department and 72.7% reported that they know how to get involved on campus. The qualitative data from the open-ended survey questions revealed that 15 (68.2%) of the ELLC students indicated that the transition from high school to college was easy for them, while seven (31.8%) students indicated that the transition was harder and more time consuming work than high school.

The focus group participants all agreed that they were easily able to make friends. They said that they were able to connect with students who had similar interests. The majority of the focus group participants noted that living together was great, besides the one participant who resided outside of the ELC. The students also agreed that they were satisfied with their academic experience. In Flynn's (2012) study of the ELLC, the theme of making friends and academics were the most satisfying aspects of the ELLC, while the least satisfying aspect was the activities. Tinto's (1988) theory on student departure, is evident in that the ELC participants seemed to have successfully transitioned from high school to college and become completely integrated into the university.

In addition to transitioning, being able to make connections within the university, both socially and academically, helps with student retention and graduation rates (Tinto, 1996, 1997, 1998, 1999, 2003). The data from the survey indicated that ELC students felt connected to their campus. A total of 92.8% of the ELC students agreed that they were made to feel welcome at Rowan, while 81.2% agreed that they generally knew what was happening on campus. Also, 91.3% of the ELC students agreed that their experience was enjoyable and 89.8% reported that they felt a sense of belonging about their campus and about Rowan University. In Flynn's (2012) study of the ELLC, 86.3% of the ELLC students strongly agreed or agreed that the students are made to feel welcome on the Rowan campus and 95.5% strongly agreed or agreed that it is an enjoyable experience to be a student on the campus.

When students go beyond the classroom experience and get involved on campus they increase their sense of connectedness as illustrated by Astin's (1999) student involvement theory. According to the focus group, ELC students were all encouraged to participate in their ELC seminar activities, developed and planned by either the student worker, faculty, or ELC intern. They seemed to enjoy most of the activities, but indicated that some were repetitive or unnecessary. The focus group also reported that ELC students studied and worked together. Furthermore, the ELC students made new friends and enjoyed living together, however, they would have liked more opportunities to interact and get to know students outside of their majors.

**Research question 2.** How do ELC students report their level of interactions with peers and faculty at Rowan University and with the College of Engineering?

The data on peer relationships within the ELC, indicated that 92.8% of the ELC students agreed that they consider some people in their major to be their friends. A total of 87% of the ELC students agreed that they spent time with classmates outside of class and 85.5% reported that it was easy to make friends in their major. Eighty-four percent of the ELC students reported that they were easily able to meet people and make friends, and that they had a network of supportive peers. A total of 79.7% of the ELC students agreed that they have built strong relationships with peers in the College of Engineering. Furthermore, about 65.2% agreed that they often studied with students in their major and 63.7% agreed that it was easy to make friends with students outside of their major. All but one student in the focus group agreed that they study with people in the ELC, and they were glad they were able to walk down the residence hall to ask someone in their class a question.

The data has shown that though ELC students indicated that they study and work together, very few seemed to have an increased relationship with faculty. Only 20.2% of the ELC students agreed that they interacted with teachers outside of the classroom and 55.1% agree that faculty took student differences into consideration when they taught. A total of 73.9% agreed that they felt comfortable approaching their teachers outside of class, while 72.4% agreed that they felt comfortable speaking in class. A total of 69.6% agree that they felt comfortable asking questions in class, 69.5% agreed that professors

cared about them as an individual, and 62.3% agreed that the quality of the instruction in most classes was excellent.

In Flynn's (2012) study of the ELLC, 52% of ELLC students reported that they strongly agreed or agreed they felt comfortable approaching their teachers outside of class. About 68% of ELLC members indicated that they strongly agreed or agreed they felt comfortable speaking in class and 64% indicated they strongly agreed or agreed they felt comfortable asking questions in class. Fifty percent of ELLC members indicated they strongly agreed or agreed their teachers cared about them as individuals, while only 32% of ELLC members indicated they strongly agreed or agreed that they interacted with teachers outside of the classroom.

The findings in Zobel's (2011) study is significantly different. About 88% of the ELC participants in her research indicated that they had formed a strong relationship with the engineering faculty. Perhaps the results of this study would have been different if the faculty were more present and vocal during the ELC seminars. The interaction with engineering faculty in Zobel's study was greater. Nevertheless, Zobel's study states that ELC programs were hosted by different engineering faculty members, unlike the ELC program in this study, which was mostly presented by other departments on campus and ELC student workers.

**Research question 3.** What were the satisfaction levels of students participating in the ELC?

Overall, 95.6% of the ELC students agreed that they intended to continue their education in engineering and at Rowan. About 92.8% agreed they were confident in their ability to complete their degree and that they were overall satisfied with their experience at Rowan, while 85.5% agreed they were satisfied with their choice of major.

Additionally, open-ended survey questions indicated that ELC students were satisfied with the learning experience, ability to make friends, professors, and getting involved in clubs and extracurricular activities. The least satisfying aspects were the quality of the professors and the workload/curriculum. This illustrates Astin's (1984, 1996, 1999) theory on student satisfaction which suggests that students who are satisfied with their academics, social interactions, and their overall college experience are more likely to return to the institution.

**Research question 4.** What is the influence of ELC student workers on freshmen ELC students' GPA, retention, and feelings of connectedness toward the College of Engineering and Rowan University?

From the analysis of the surveys, it seems that ELC students interaction with the ELC student workers was not as impactful. A total of 60.8% reported that the student workers were helpful and they were satisfied with their performance. About 44.9% agreed that their student worker cared about them as individuals, while 40.5% felt valued by the student workers. A total of 47.8% reported they felt comfortable approaching student workers outside of the classroom and that other student workers cared about them as individuals. About 39.1% of ELC students reported they considered student workers to

be a friend. Lastly, 33.3% indicated that they interacted with student workers.

Additionally, 31 out of the 69 ELC students indicated in the open-ended questions that student workers were supportive. Sixteen students reported that the student workers had no impact on their lives, while seven students reported that the student workers helped them with their transition to college. Only four ELC students indicated they did not know other student workers. This can be due to the structure, timing, and location of the ELC seminars or the fact that there are fewer opportunities for other student workers to interact with the five ELC sections.

**Research question 5.** What do ELC students report about their experiences with the ELC, Rowan University, and student workers?

From the content analysis of the focus group interview, in regard to the experiences with the Engineering Learning Community (ELC), the students were able to make friends and develop their resume. However, busy schedules with studying and working on group projects made it hard for them to have time to interact with other people outside of the ELC. The most satisfying aspects of the ELC experience was meeting people with the same majors and living together and next to other ELC students who shared similar interests. In regard to the experiences with Rowan University, ELC students reported that they had great connections with ELC faculty, but lacked a connection with other faculty outside of the ELC. ELC students do not interact as much with those engineering students outside of the ELC. One of the improvements that the focus group recommended was making the ELC seminar a credited course, this way

students would take the course more seriously if they could be possibly be in danger of failing. Lastly, in regard to the experiences with the ELC student workers, ELC students reported that the student workers were enjoyable, helpful, and improved their sense of belonging. However, it was also reported that there was no connection made with ELC student workers. This could be a result of the fact that not all ELC student workers resided in the same residence hall as the ELC students and also that they only saw their student worker every other week. Even though the focus group reported that there were no least beneficial aspects of the student worker, the group suggested having a monthly check-in process for the second semester of the ELC. This would cut out the unnecessary and repetitive ELC seminars and gives students time to get more involved with clubs and organizations and work on research projects with faculty.

## **Conclusions**

The results of the data collected from this study suggest that there is a positive impact on the ELC participants in regards to students' transition from high school to college, connectedness to college, peer relationships, student worker interaction, and overall satisfaction with the university. The study has shown that participation in the Engineering Learning Community (ELC) has a positive impact as supported by previous and other relevant studies. Tinto (2003) explains that learning communities help students construct knowledge, learn together, work together, feel a sense of community, and transform how they are taught and experience the curriculum. Studies have shown many benefits that increase retention rates including when a student feels connected

academically and socially to their university. Moreover, students increase their commitment to degree attainment through campus activities, being involved, and building positive relationships with faculty (Astin, 1984, 1996, 1999; Smith, 2001; Tinto, 1996, 1998, 1999, 2003; Zhao & Kuh, 2004).

Overall, this study shows that the freshmen students benefited from participating in the Engineering Learning Community (ELC). The students reported they were satisfied with their overall experience and their transition to college was relatively easily. A total of 82.6% of the ELC students reported that they strongly agreed or agreed that it was easy to adjust to college socially, while 76.8% felt it was easy to adjust to college academically. In Flynn's (2012) study of the ELLC, 81.8% of the students felt it was easy for them to adjust to college socially, while 77.3% felt it was easy to adjust to college academically. In regard to the statement asking if the students felt there was an adequate number of services available to help with career planning, a total of 82.6% of the ELC students strongly agreed or agreed, while 61.9% of the ELLC reported that they strongly agreed or agreed. In Barrie's (2016) study of the Mathematics Learning Community, 80.5% of the MLC students reported that they strongly agreed or agreed that their social transition to college was easy, and 66.7% of the MLC members reported that they strongly agreed or agreed that it was easy for them to adjust academically to college.

Previous studies indicate that strong peer relationships influence student involvement and student satisfaction, which positively impacts students' sense of community and belonging to the campus (Astin, 1993,1999; Meeuwisse, Severiens, &



Born, 2010; O’Keeffee, 2013; Spanierman et al., 2013; Tinto, 1988). Positive interactions with faculty and peers influence a sense of belonging through supportive social and academic environments that keep students from leaving school (Meeuwisse, Severiens, & Born, 2010; O’Keeffee, 2013). As long as students remain enrolled the retention rate and reputation of the institution increases.

In regards to the ELC students connectedness to Rowan University, a total of 92.8% of the ELC students strongly agreed or agreed that the students are made to feel welcome on the campus, 89.8% strongly agreed or agreed that there is a sense of belonging at Rowan, and that it is an enjoyable experience to be a student on the campus. Flynn’s (2012) results were slightly lower as 86.3% of the ELLC students strongly agreed or agreed that the students are made to feel welcome on this campus, 86.4% strongly agreed or agreed that there is a sense of belonging at Rowan, and 95.5% strongly agreed or agreed that it is an enjoyable experience to be a student on the campus. Barrie’s (2016) results showed that 91.7% of the MLC students strongly agreed or agreed that the students are made to feel welcome on this campus, 83.3% strongly agreed or agreed that there is a sense of belonging at Rowan, and 88.9% strongly agree or agreed that it is an enjoyable experience to be a student on the campus. Overall, the results of my study confirmed previous research that learning communities help increase students’ connectedness to Rowan.

The peer interaction aspect is where the students in the ELC, MLC and ELLC differed the most. At total of 95.6% of the ELC students strongly agreed or agreed that

they considered some of the students in their major to be their friend, while 80.5% of the MLC students strongly agreed or agreed that they considered some of the students in their major to be their friend, and 100% of the ELLC students strongly agreed or agreed. Eighty-seven percent of ELC students strongly agreed or agreed that they spent time with classmates outside of class, while 77.8% of the MLC members strongly agreed or agreed that they spent time with classmates outside of class, and 95.4% of the ELLC students strongly agreed to agreed. Lastly, 85.5% of ELC students strongly agreed or agreed that it was easy to make friends in their major and they felt like they had a network of supportive peers in their major, while 69.4% of the MLC students found it was easy to make friends in their major, and 75% felt like they had a network of supportive peers in their major.

Overall, the ELC members are confident in their ability to complete their engineering degree and the requirements were clear and reasonable. The faculty in the College of Engineering has made themselves available to students outside of class and the ELC members have taken advantage of this opportunity.

The study does not, however, show a major impact of student workers on ELC student life (i.e. academics, social life, attitude towards engineering, etc.). Only 60.8% of ELC students thought that the student workers were helpful and were satisfied with their performance. Less than half (47.8%) of the ELC students felt comfortable approaching student workers outside of the classroom. Thirty-three point three percent of ELC students reported interacting with student workers. Since this is the first year of the ELC

having prior ELC students playing the role as ELC student workers for the ELC seminar course the results can help improve the role, impact, and influence in the future. Perhaps a better explanation and more interaction of the ELC students with all of the student workers will increase the impact on future ELC students from academics to social development.

According to the subjects, the most satisfying aspect of the ELC is that they were able to make friends which was the most common theme during the focus group. The students reported that they liked living together and such proximity helped augment their academic experience. The students reported that student workers were helpful but they could have been even more helpful if they interacted more with them. As for recommendations to improve the learning community, the students suggested having fewer activities during the spring semester, and replacing them with a monthly check-in with student workers and ELC professors.

### **Recommendations for Practice**

Based upon the findings and conclusions of the study, the following suggestions are presented:

1. Living and learning communities should evaluate and assess the performance of their ELC professors.

2. Living and learning community participants should be able to have a choice in the ELC seminar activities and programs presented during the spring semester from a list provided at the end of the fall semester.
3. ELC participants should have more opportunities to get to know and interact with all student workers.
4. There should be a College of Engineering orientation to give ELC students the opportunity to meet other non-ELC engineering majors.
5. There should be a meet-and-greet for all of Rowan's learning communities to foster social engagement and common bonds.

### **Recommendations for Further Research**

Based upon the findings and conclusions of the study, the following suggestions are presented:

1. Conduct a longitudinal study with ELC participants to monitor progress during all four years at Rowan.
2. Freshman engineering students should be surveyed at the end of their first academic year to gain a better understanding of how they feel during this critical transition period.
3. Further research should focus on comparing the Rowan engineering learning community to other institutions that have engineering learning communities.

4. Future studies should be conducted on the ELC at Rowan University and focus on the impact of student workers on their impact of ELC student retention, connectedness, peer interaction, and transition.
5. Upper class engineering majors should be surveyed to find out about their experiences beyond participation in the ELC as freshmen.

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## Appendix A

### Institutional Review Board Approval



\*\* This is an auto-generated email. Please do not reply to this email message.  
The originating e-mail account is not monitored.  
If you have questions, please contact your local IRB office \*\*

**DHHS Federal Wide Assurance Identifier:** FWA00007111  
**IRB Chair Person:** Harriet Hartman  
**IRB Director:** Sreekant Murthy  
**Effective Date:** 3/1/2017

#### eIRB Notice of Approval

#### STUDY PROFILE

<b>Study ID:</b>	Pro2016001477		
<b>Title:</b>	Living-Learning Communities: The impact in Freshmen Engineering students and influence of student workers		
<b>Principal Investigator:</b>	Burton Sisco	<b>Study Coordinator:</b>	None
<b>Co-Investigator(s):</b>	Felicia Crockett	<b>Other Study Staff:</b>	None
<b>Sponsor:</b>	Department Funded	<b>Approval Cycle:</b>	Twelve Months
<b>Risk Determination:</b>	Minimal Risk	<b>Device Determination:</b>	Not Applicable
<b>Review Type:</b>	Expedited	<b>Expedited Category:</b>	6 7
<b>Subjects:</b>	135		

#### CURRENT SUBMISSION STATUS

<b>Submission Type:</b>	Research Protocol/Study	<b>Submission Status:</b>	Approved
<b>Approval Date:</b>	3/1/2017	<b>Expiration Date:</b>	2/28/2018
<b>Pregnancy Code:</b>	Not Applicable	<b>Pediatric Code:</b>	Not Applicable
<b>Prisoner Code:</b>	Not Applicable		

<b>Protocol:</b>	Living-Learning Community Protocol Survey Focus Group questions ELC Director Letter of Consent Permission to use Instrument	<b>Consent:</b>	There are no items to display	<b>Recruitment Materials:</b>	There are no items to display
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**\* Study Performance Sites:**

Glassboro Campus

201 Mullica Hill Rd, Glassboro, NJ 08028

**ALL APPROVED INVESTIGATOR(S) MUST COMPLY WITH THE FOLLOWING:**


1. Conduct the research in accordance with the protocol, applicable laws and regulations, and the principles of research ethics as set forth in the Belmont Report.
2. **Continuing Review:** Approval is valid until the protocol expiration date shown above. To avoid lapses in approval, submit a continuation application at least eight weeks before the study expiration date.
3. **Expiration of IRB Approval:** If IRB approval expires, effective the date of expiration and until the continuing review approval is issued: **All research activities must stop unless the IRB finds that it is in the best interest of individual subjects to continue. (This determination shall be based on a separate written request from the PI to the IRB.) No new subjects may be enrolled and no samples/charts/surveys may be collected, reviewed, and/or analyzed.**
4. **Amendments/Modifications/Revisions:** If you wish to change any aspect of this study, including but not limited to, study procedures, consent form(s), investigators, advertisements, the protocol document, investigator drug brochure, or accrual goals, you are required to obtain IRB review and approval prior to implementation of these changes unless necessary to eliminate apparent immediate hazards to subjects.
5. **Unanticipated Problems:** Unanticipated problems involving risk to subjects or others must be reported to the IRB Office (45 CFR 46, 21 CFR 312, 812) as required, in the appropriate time as specified in the attachment online at: <http://www.rowan.edu/som/hsp/>
6. **Protocol Deviations and Violations:** Deviations from/violations of the approved study protocol must be reported to the IRB Office (45 CFR 46, 21 CFR 312, 812) as required, in the appropriate time as specified in the attachment online at: <http://www.rowan.edu/som/hsp/>
7. **Consent/Assent:** The IRB has reviewed and approved the consent and/or assent process, waiver and/or alteration described in this protocol as required by 45 CFR 46 and 21 CFR 50, 56, (if FDA regulated research). Only the versions of the documents included in the approved process may be used to document informed consent and/or assent of study subjects; each subject must receive a copy of the approved form(s); and a copy of each signed form must be filed in a secure place in the subject's medical/patient/research record.
8. **Completion of Study:** Notify the IRB when your study has been stopped for any reason. Neither study closure by the sponsor or the investigator removes the obligation for submission of timely continuing review application or final report.
9. The Investigator(s) did not participate in the review, discussion, or vote of this protocol.
10. **Letter Comments:** *There are no additional comments.*

**CONFIDENTIALITY NOTICE:** This email communication may contain private, confidential, or legally privileged information intended for the sole use of the designated and/or duly authorized recipients(s). If you are not the intended recipient or have received this email in error, please notify the sender immediately by email and permanently delete all copies of this email including all attachments without reading them. If you are the intended recipient, secure the contents in a manner that conforms to all applicable state and/or federal requirements related to privacy and confidentiality of such information.

## Appendix B

### Permission to use Flynn's (2012) Instrumentation

Thesis Survey Permission Inbox x

 **Crockett, Felicia** <crockett15@studentx.rowan.edu> Nov 7 (13 days ago) ☆ ↶ ▾  
to gmaggie, Burton, Jess ▾

Hi Maggie Flynn Grant,


I hope this email finds you well. My name is Felicia Crockett and I am in my second year of the Master's in Higher Education Administration and I am doing my internship with the Engineering Learning Community (ELC) at Rowan University. I am writing my thesis on Living-Learning Communities: The impact on freshman engineering students and influence of student workers. Your study was a very helpful reference for me in writing my chapters 1-3 and I would like to model and adapt my survey off of yours. With the changes to the eIRB process, I would like to get your permission to use your survey instrumentation and publish the adapted survey in the appendix of my thesis?

Please feel free to contact me via cell phone (listed below) or email.

Best,

Felicia Crockett  
Master's Candidate, Higher Education 'S 2017  
Rowan University, Higher Education Administration Track  
crockett15@studentx.rowan.edu  
[862.200.8645](tel:862.200.8645)

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 **Grant, Maggie Flynn** Nov 7 (13 days ago) ☆ ↶ ▾  
to me ▾

Hi Felicia,

Thanks for reaching out to me. I am honored that you have chosen to model your thesis after mine! You most certainly have my permission to use my survey! It'll be interesting to see how your study correlates with the one I did.

Are you working with Dr. Jess Everett? Do you have MaryBeth and Dr. Sisco? They were awesome teachers. I hope you're enjoying your time at Rowan! Please tell Jess, MaryBeth & Dr. Sisco that I say hi.

Best of luck with your paper! Let me know if you have any questions.

**MAGGIE GRANT** | [Special Events Coordinator](#)  
Medical and Health Sciences Foundation | University of Pittsburgh and UPMC  
Forbes Tower, Suite 8084 | 3600 Forbes Ave. at Meyran Ave. | Pittsburgh, PA 15213  
[phone: 412.864.3058](tel:412.864.3058) | [fax: 412.647.8300](tel:412.647.8300) | [email: gmaggie@omhsf.org](mailto:gmaggie@omhsf.org)

## **Appendix C**

### **Survey Alternative Consent Form**

#### **PAPER SURVEY (ALTERNATE CONSENT)**

I am/we are inviting you to participate in a research survey entitled “Living-Learning Communities: The impact on freshmen engineering students and influence if student workers.” We are inviting you because you are a freshmen engineering student enrolled in the Engineering Living-Learning Community from the College of Engineering. In order to participate in this survey, you must be 18 years or older.

The survey may take approximately 10 to 15 minutes to complete. Your participation is voluntary. If you do not wish to participate in this survey, do not respond to this paper survey. The number of subjects to be enrolled in the study will be 135 and the number of desired subjects completing the survey is 95 for a response rate of 70%.

The purpose of this research study is to examine the effectiveness of a freshman engineering learning community (ELC) at Rowan University. The study will assess the impact that an engineering learning community (ELC) had on its freshmen engineering students. In addition, this study will investigate the impact that ELC student workers had on engineering learning students grade point average (GPA), retention rate, and the attitude of engineering students towards the program.

Completing this survey indicates that you are voluntarily giving consent to participate in the survey.

There are no risks or discomforts associated with this survey. There may be no direct benefit to you, however, by participating in this study, you may help us understand how participating in the Engineering Learning Community (ELC) has impacted the student first year at Rowan University.

Your response will be kept confidential. We will store the data in a secure computer file and the file will be destroyed once the data has been published. Any part of the research that is published as part of this study will not include your individual information. If you have any questions about the survey, you can contact me/or the researcher at the address provided below, but you do not have to give your personal identification.

Contact information:

Dr. Burton Sisco, Principal investigator: [sisco@rowan.edu](mailto:sisco@rowan.edu)

Felicia Crockett, Investigator: [crockettf6@students.rowan.edu](mailto:crockettf6@students.rowan.edu)

Rowan University Glassboro/CMSRU IRB: (856) 256-4078

## Appendix D

### Freshman Engineering Survey

#### Freshmen Engineering Learning Community (ELC) Survey

Please circle, check, or fill in the blanks of those that apply to you.

1. I am: Male \_\_\_ Female \_\_\_ Other \_\_\_

**2. Ethnic background:**

\_\_\_ Black/African American

\_\_\_ Native American

\_\_\_ Asian/Pacific Islander

\_\_\_ White/Caucasian

\_\_\_ Hispanic/Latino

\_\_\_ Others: \_\_\_\_\_

**3. Highest level of Mother's education:**

a) Elementary

b) Some high school/no diploma

c) High school diploma/equivalent

d) Some college/no degree

e) Associate's degree (2 yr degree)

f) Bachelor's degree (4 yr degree)

g) Master's degree

h) Doctoral degree

**4. Highest level of Father's education:**

a) Elementary

b) Some high school/no diploma

c) High school diploma/equivalent

d) Some college/no degree

e) Associate's degree (2 yr degree)

f) Bachelor's degree (4 yr degree)

g) Master's degree

h) Doctoral degree

**5. The level of education I hope to complete is:**

a) 4 year college degree (Bachelor's)

b) Master's degree

c) Doctoral degree

**6. My GPA in high school was:**

a) 4.0 +

b) 3.5-4.0

c) 3.0-3.5

d) 2.5-3.0

e) 2.0-2.5

f) 1.5-2.0

**7. My engineering major is:**

a) Biomedical

b) Chemical

c) Civil & Environmental

d) Electrical & Computer

e) Engineering Entrepreneurship

f) Mechanical

**8. I have at least one parent who is an engineer:**

\_\_\_ Yes \_\_\_ No

<b>B. Please indicate your level of agreement with the statement by the number in the box you feel is most accurate.</b>	<b>Strongly Agree (5)</b>	<b>Agree (4)</b>	<b>Neutral (3)</b>	<b>Disagree (2)</b>	<b>Strongly Disagree (1)</b>
1. I feel included in the engineering department.	5	4	3	2	1
2. I consider some students in my major to be my friends.	5	4	3	2	1
3. I spend time with classmates outside of class.	5	4	3	2	1
4. It was easy for me to adjust to college academically.	5	4	3	2	1
5. It was easy for me to adjust to college socially.	5	4	3	2	1
6. I was easily able to meet people and make friends.	5	4	3	2	1
7. I feel a sense of belonging at Rowan University.	5	4	3	2	1
8. I often study with other students in my major.	5	4	3	2	1
9. I interact with my teachers outside of the classroom.	5	4	3	2	1
10. I feel comfortable approach student workers outside of class.	5	4	3	2	1
11. I feel comfortable asking questions in class.	5	4	3	2	1
12. I feel comfortable speaking in class.	5	4	3	2	1
13. I intend to continue my education at Rowan University.	5	4	3	2	1
14. I intend to continue my education in engineering.	5	4	3	2	1



15. I am confident in my ability to complete my degree.	5	4	3	2	1
16. I have built strong relationships with peers in the College of Engineering.	5	4	3	2	1
17. My professors care about me as an individual.	5	4	3	2	1
18. The student workers care about me as an individual.	5	4	3	2	1
19. It is easy for me to make friends with students outside my major.	5	4	3	2	1
20. Faculty are fair and unbiased in their treatment of individual students.	5	4	3	2	1
21. It is an enjoyable experience to be a student on this campus.	5	4	3	2	1
22. Tutoring services are readily available.	5	4	3	2	1
23. I feel a sense of belonging about my campus.	5	4	3	2	1
24. There are sufficient number of weekend activities for students.	5	4	3	2	1
25. I interact with the student workers.	5	4	3	2	1
26. I know how to get involved in campus organizations.	5	4	3	2	1
27. There are adequate service to help me with career planning.	5	4	3	2	1
28. Faculty take into consideration student differences as they teach a course.	5	4	3	2	1

29. The requirements for my major are clear and reasonable.	5	4	3	2	1
30. The quality of instruction I receive in most of my classes is excellent.	5	4	3	2	1
31. I feel valued by the student workers.	5	4	3	2	1
32. Faculty are usually available after class and during office hours.	5	4	3	2	1
33. Overall, I am satisfied with my experience at Rowan.	5	4	3	2	1
34. I am satisfied with student workers performance.	5	4	3	2	1
35. I am satisfied with my choice of major.	5	4	3	2	1
36. I have a network of supportive peers in my major.	5	4	3	2	1
37. I feel like I am part of the engineering community.	5	4	3	2	1
38. The student workers were helpful.	5	4	3	2	1
39. Students are made to feel welcome on this campus.	5	4	3	2	1
40. I consider the student workers as a friend.	5	4	3	2	1
41. It is easy for me to make friends with students in my major.	5	4	3	2	1
42. I am satisfied with my experience in engineering.	5	4	3	2	1
43. I generally know what's happening on campus.	5	4	3	2	1

44. My student worker care about me as an individual.	5	4	3	2	1
45. I feel comfortable approaching my teachers outside of class.	5	4	3	2	1

**C. Please write a short response to the following questions.**

1. What has been the most satisfying aspect of your College of Engineering experience at Rowan University?

2. What has been the most disappointing aspect of your College of Engineering experience at Rowan University?

3. Describe your transition from high school to college (i.e. your overall readiness, level of difficulty, comfort in your major, etc.)

4. Are you involved on campus (i.e. events, clubs, organizations)?  
 Yes  No

5. If yes, what were the reasons you decided to get involved on-campus?

6. Do you feel like you have support from the student workers?  
 Yes  No

7. Describe the impact of the student worker on your life (i.e. academics, social life, attitude towards engineering, etc.).

8. In what ways does your involvement within your major affect your relationship with your professors?

Thank you for participating in this important survey.

## Appendix E

### Audio Consent Form



Rowan university Institutional Review Board  
Audio/Videotape Addendum to Consent form

You have already agreed to participate in a research study conducted by Burton R. Sisco, Ed. D. We are asking for your permission to allow us to use audiotape (sound) as part of that research study. You do not have to agree to be recorded in order to participate in the main part of the study.

The recording(s) will be used for:

- Analysis by the research team

The recording(s) will include the unique identifier assigned to each focus group (FG# for Focus Group) and the interview questions and answers.

The recording(s) will be stored in a locked file cabinet with no link to subjects' identity and will be retained for six years and then destroyed.

Your signature on this form grants the investigator named above permission to record you as described above during participation in the above-referenced study. The investigator will not use the recording(s) for any other reason than that/those stated in the consent form without your written permission.

#### **Social and Behavioral IRB Research Agreement**

I have read the procedure described above. I voluntarily agree to participate in the procedure and **I have received a copy of this description.**

Name (Printed) \_\_\_\_\_

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

Principal Investigator: \_\_\_\_\_ Date: \_\_\_\_\_

## Appendix F

### Focus Group Consent Form



#### LIVING-LEARNING COMMUNITIES: THE IMPACT ON FRESHMEN ENGINEERING STUDENTS AND INFLUENCE OF STUDENT WORKERS

#### **Informed Consent for Focus Groups without Record Reviews (Expedited Review without identifiers)**

**Please read this consent document carefully before you decide to participate in this study.**

You are invited to participate in a research study about understanding the effectiveness of a freshman engineering learning community (ELC) at Rowan University. This study is being conducted by researchers in the Department of Education at Rowan University. The Principal Investigator of the study is Dr. Burton Sisco.

Participation in this study is voluntary. If you agree to participate in this study, you would be asked to join one of two focus groups each lasting for about one hour. The number of participants in the each focus group is 6 for a total of 12.

The study will include two focus groups with six student volunteers participating in each session. You will be asked a total of 12 questions in regards to your experience in the Engineering Learning Community (ELC), at Rowan University, and with ELC student workers.

There is little risk in participating in this study. Your identity will be kept confidential to the extent provided by law. Your information will be assigned a code number that is unique to this study. No one other than the researchers would know whether you participated in the study. Study findings will be presented only in summary form and your name will not be used in any report or publications.

Participating in this study may not benefit you directly, but it will help us learn how participating in the Engineering Learning Community (ELC) has impacted the student first year at Rowan University. Your participation in this study is completely voluntary. If you choose not to participate in this study, this will have no effect on the services or benefits you are currently receiving. You may skip any questions you don't want to answer and withdraw from the study at any time without consequences.

If you have any questions about this study, please contact Dr. Burton Sisco at 856-256-4500 x 3717 or [sisco@rowan.edu](mailto:sisco@rowan.edu). If you have questions about your rights as a research participant, please contact the Rowan University Glassboro/CMSRU IRB at (856) 256-4078.

## Appendix G

### Focus Group Questions

#### Demographic Information

Please circle, check, or fill in the blanks of those that apply to you.

1. I am: Male \_\_\_ Female \_\_\_ Other \_\_\_

**2. Ethnic background:**

\_\_\_ Black/African American

\_\_\_ Native American

\_\_\_ Asian/Pacific Islander

\_\_\_ White/Caucasian

\_\_\_ Hispanic/Latino

\_\_\_ Others: \_\_\_\_\_

**3. Highest level of Mother's education:**

- a) Elementary
- b) Some high school/no diploma
- c) High school diploma/equivalent
- d) Some college/no degree
- e) Associate's degree (2 yr degree)
- f) Bachelor's degree (4 yr degree)
- g) Master's degree
- h) Doctoral degree

**4. Highest level of Father's education:**

- a) Elementary
- b) Some high school/no diploma
- c) High school diploma/equivalent
- d) Some college/no degree
- e) Associate's degree (2 yr degree)
- f) Bachelor's degree (4 yr degree)
- g) Master's degree
- h) Doctoral degree

**5. The level of education I hope to complete is:**

- a) 4 year college degree (Bachelor's)
- b) Master's degree
- c) Doctoral degree

**6. My GPA in high school was:**

- a) 4.0 +
- b) 3.5-4.0
- c) 3.0-3.5
- d) 2.5-3.0
- e) 2.0-2.5
- f) 1.5-2.0

**7. My engineering major is:**

- a) Biomedical
- b) Chemical
- c) Civil & Environmental
- d) Electrical & Computer
- e) Engineering Entrepreneurship
- f) Mechanical

**8. I have at least one parent who is an engineer:**

\_\_\_ Yes \_\_\_ No

**9. My GPA now is:** \_\_\_\_\_

## **Focus Group Interview Questions**

### **ELC Experience**

1. (A) Describe your overall satisfaction with the Engineering Learning Community (ELC) experience.  
(B) How could your overall satisfaction with the ELC be improved?
- 2.(A) Describe your overall satisfaction with the social activities in the Engineering Learning Community (ELC).  
(B) How could your overall satisfaction with the social activities be improved?
3. What was the most satisfying aspect of your experience with the ELC?
4. What was the most dissatisfying aspect of your experience with the ELC?

---

### **University Experience**

5. Describe how your participation in the ELC improved or did not improve your overall sense of belonging at Rowan University.
6. Describe how your participation in the ELC improved or did not improve your opportunities to interact with Rowan Engineering faculty and staff.
7. Describe how your participation in the ELC improved or did not improve your relationships with other ELC participants.
8. Describe how your participation in the ELC improved or did not improve your connection with non-ELC engineering peers.

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### **Student Worker Experience**

9. Describe your experience with the student workers.
10. What was the most beneficial aspect of the student worker?
11. What was the least beneficial aspect of the student worker?
12. How could the overall experience with the student worker be improved?



## **Appendix H**

### **Rules and Procedures for Logical Analysis of Written Data**

#### **Analysis of Written Data**

The following decisions were made regarding what was to be the unit of data analysis (Sisco, 1981):

1. A phrase or clause will be the basic unit of analysis.
2. Verbiage not considered essential to the phrase or clause will be edited out-- e.g., articles of speech, possessives, some adjectives, elaborative examples.
3. Where there is a violation of convention syntax in the data, it will be corrected.
4. Where there are compound thoughts in a phrase or clause, each unit of thought will be represented separately (unless one was an elaboration of the other).
5. Where information seems important to add to the statement in order to clarify it in a context, this information will be added to the unit by using parentheses.

The following decisions were made regarding the procedure for categorization of content units:

1. After several units are listed on a sheet of paper, they will be scanned in order to determine differences and similarities.
2. From this tentative analysis, logical categories will be derived for the units.
3. When additional units of data suggest further categories, they will be added to the classification scheme.

4. After all the units from a particular question responses are thus classified, the categories are further reduced to broader clusters (collapsing of categories).
5. Frequencies of units in each cluster category are determined and further analysis steps are undertaken depending on the nature of the data-- i.e., ranking of categories with verbatim quotes which represent the range of ideas or opinions. (p. 177).