
AC 2011-2358: IMPACTS OF LIVING LEARNING COMMUNITIES ON ENGINEERING STUDENT ENGAGEMENT AND SENSE OF AFFILIATION

Shannon Ciston, University of New Haven

Shannon Ciston is an Assistant Professor of Multidisciplinary Engineering at the University of New Haven in Connecticut. Her background is in Chemical Engineering, with degrees from Northwestern University (Ph.D.) and Illinois Institute of Technology (B.S.). Dr. Ciston's research interests are in two main areas: Engineering Education (including student experience, attitudes, and perceptions) and Sustainability (including impacts of the Chemical and Energy industries on water resources).

Maria-Isabel Carnasciali, Ph.D., University of New Haven

Assistant Professor of Systems & Multidisciplinary Engineering at the Tagliatela School of Engineering - University of New Haven, CT. Obtained her Ph.D. in Mechanical Engineering from Georgia Tech in 2008. Her undergraduate degree is from M.I.T. from the Mechanical Engineering Department received in 2000. Current engineering education research focuses on assessing the impact of exposure to metacognition ideas/skills. Other research interests involve validation of CFD models for aerospace applications as well as optimizing efficiency of Thermal-Fluid systems.

Jean Nocito-Gobel, University of New Haven

Jean Nocito-Gobel, an Associate Professor of Civil & Environmental Engineering at the University of New Haven, received her Ph.D. from the University of Massachusetts, Amherst. She is currently serving as the Coordinator for the First Year Program. Her professional interests include modeling the transport and fate of contaminants in groundwater and surface water systems, as well as engineering education reform.

Cory Carr

Impacts of Living Learning Communities on Engineering Student Engagement and Sense of Affiliation

Themed residential communities at university colleges are a long-standing tradition, with roots in European, Asian, American, and other models of higher education. The trend of establishing Living Learning Communities or other themed living groups at middle- to large-sized universities is on the rise and recent findings from the National Survey of Student Engagement show that participation in learning communities are correlated with high levels of student engagement and satisfaction with college. How are Living Learning Communities different from other learning communities, such as self-formed study groups or disciplinary clubs? How do Living Learning Communities established in the freshman year impact student affiliation and the formation of student groups throughout the bachelor's degree program? This study explores the impacts of a Freshmen Engineering Living Learning Community on student affiliation and engagement within the Tagliatela College of Engineering and the university as a whole throughout the duration of the undergraduate degree study, and examines the effects of Living Learning Communities on establishing student in-groups and out-groups among undergraduate students based on residence status (Living Learning Community, General Residential, Commuter) and the perceptions of Living Learning Communities at a small private university. Data was collected through the use of student surveys, including 135 engineering student responses representing students who participated in the LLC and those who did not. This paper summarizes the methods and findings of this study, and will discuss the implications of these findings on the implementation of Engineering Living Learning Communities and strategies to engage residential and commuter students in university life and academics. The Engineering LLC was perceived as a positive experience by students who participated and those who did not. Students within the LLC were more likely to form study groups that persist for years after the freshman year.

Background:

The Merits of Living Learning Communities:

The tradition of students of higher learning living and studying together has deep roots in cultures around the world. Groups of religious scholars throughout Europe and Asia may be some of the earliest examples of the beginnings of Living Learning Communities (LLCs) as we know them now. In the United States the need to provide residences for students, particularly young adults, close to classes and embedded within the campus community has been common practice since the formation of our oldest colleges and universities. The concept of themed dormitory housing, such as floors reserved for students of a particular major or extra-curricular interest, and living/learning communities in earnest, began with Alexander Meiklejohn's experimental college at the University of Wisconsin in 1927, and have continued to expand.¹ Living Learning Communities can be defined as by Inkelas, Zeller, Murphy, and Hummel: students, "1) live together on campus, 2) take part in a shared academic endeavor, 3) use

resources in their residence environment designed specifically for them, and 4) have structured social activities in their residential environment that stress academics.”²

Many studies have been published which examine the impacts of student residence on campus and LLCs in particular on student participants. Living in college residence halls in general can impact student development along social, academic, and moral dimensions,³ and themed LLCs offer unmatched opportunities for educating a student holistically because of the integration and extension of degree work themes to the living environment.⁴ Students who participate in LLCs report high levels of satisfaction with their college experience compared to their peers who do not participate in such programs.⁵ Some studies also show that students engaged in Living Learning programs score higher grades.^{6,7} The literature shows us that faculty engagement can enhance student experience and outcomes, and many LLCs take advantage of commonality in the interests of students and faculty to make connections outside the classroom.^{8,9} Findings from the National Survey of Student Engagement affirm that participation in learning communities are correlated with high levels of student engagement and satisfaction with college.¹⁰ The National Study of Living Learning Programs reviews student outcomes with a longitudinal study and finds that Living Learning Communities can also facilitate smoother transitions for first-generation college students, provide lasting positive effects on students’ academic self confidence and civic engagement, and provide positive second hand effects for non-LLC students living in the same residence hall.¹

Most studies of LLCs focus on student academic outcomes, retention, GPA, and other metrics of student academic success.^{1,11} Previous work exploring *student perceptions* of LLCs is limited. In one study of 19 students, sophomores through seniors, that comprise three LLCs, focus groups were used to explore student perceptions.¹² The authors observed an appreciation of student participants for the community experience and culture as a whole, without specific identifiable values. Main themes that emerged from the focus groups were: “seamless learning, a scholarly environment, and an ethos of relatedness among faculty, staff, and peers.” Another unique aspect of the work described in this paper is that we gauge the perceptions of students who *have* participated in LLC program, as well as students who *have not*.

Research in the area of engineering student specific LLCs is also somewhat limited, though previous work has described LLCs for engineering students, finding that LLCs are effective for enhancing engagement, retention, and academic success.¹³⁻¹⁷ At Washington State University, student focus groups attribute positive gains to specific elements of the LLC including peer-facilitated study groups and seminars led by upperclassmen.^{14,15} Reflective essays were used to identify common themes and insights, which illuminated student perceptions that LLCs are beneficial for forming friendships and study groups.¹⁶ A recent study from the University of Central Florida investigated student perceptions of community in a STEM LLC. With 108 usable responses, they linked results to retention and success of the students.¹⁷ Living Learning Communities can enhance and supplement traditional engineering classroom work by building

important skills and values for professional engineers, such as: multidisciplinary team skills, engagement in community, and participation in professional organizations.

The Engineering Living Learning Community at the University of New Haven:

The LLC for first year engineering students is the oldest community at the University of New Haven (UNH). During the 2004-2005 academic year, the Division of Student Affairs began discussions on introducing LLCs. The decision was made to start with a single LLC, and then establish additional communities each year based on requests from the specific majors at the university. At the time, the Tagliatela College of Engineering expressed interest in providing an opportunity for residential engineering students to live together in order to promote a better study environment in the dorms and to increase student retention during the first year. Based on their interest, the engineering college was chosen to pilot the initial LLC for first year students during the 2005-2006 academic year.

During the next six years, the number of LLCs at the university has grown to ten. Including engineering, eight of the communities are major specific. Last year, the university expanded LLCs to include ones based on common interest; thus, a community was established for the Honors Program and another for all first year majors (Freshmen Connections). Although the university is committed to providing a learning community experience for all first year students, participation in the program is optional for residential students. Plans include establishing a LLC for Pre-education first year students next year.

Living Learning Communities at the University of New Haven provide first-year students in specific majors with outstanding out-of-class co-curricular and residential experiences. The result is an academic-based peer group that affords participants with additional faculty interaction, collaboration with students within the major course of study, and a variety of activities that complement in-class assignments and pertinent topics (http://www.newhaven.edu/student-life/CampusLife_StudentAffairs/residential_life/10605/). Students in a specific community live together on a common floor with residential assistants often chosen with the same or similar disciplinary background. LLC groups often form close-knit social groups and design common T-shirts, form intramural sports teams, or exhibit other public displays of group cohesion and pride. Each community is assigned one or more faculty liaisons who work with the residential assistants in overseeing the community. In addition a common feature of all communities regardless of major is that participants move into the freshman halls two days early to participate in orientation activities that facilitate the transition to the college experience while allowing students to interact with faculty outside of the academic classroom.

The activities and features of each LLC on campus vary, depending on the major. For the engineering students, the orientation activities include participation in a half-day ropes course at a nearby private high school to promote teamwork and to help students to begin getting to know

each other better in a fun and challenging activity. Engineering students in the LLC are scheduled for the same sections of the two engineering classes they take first semester freshmen year. These class sections tend to be populated predominantly with LLC students. An individual instructor may or may not be aware of LLC participant status when forming project groups. One or two tutors are available Sunday through Thursday, for two hours each night, in the common area of the dorm; thus, the engineering students do not even need to leave their dorm to get help with their courses. The liaison of the community has meetings several times during the academic year, providing students the opportunity to voice their concerns, get additional advising or hear about opportunities to participate in engineering activities on campus. Faculty members from the Tagliatela College of Engineering come to the dorm to speak to the students in the community on their research or some topic of interest periodically throughout the academic year. Typically one to two field trips are scheduled each year, with an effort made to have both an educational and social component to the trip. In previous years, engineering students have traveled to New York City, Boston, the site of the World Trade Center, Bodies the Exhibition, and the Consumer Reports testing facility

The engineering LLC has steadily increased in number since the initial group of 16 students in 2005. Summarized in the table below is the number of participants for each year of the program. The exception to an increase in the number of students in the community occurred in 2009. Originally 32 students were accepted into the program; however, 8 of them chose to participate in the study abroad program during the fall semester, and thus, were ineligible to also participate in the LLC due to limited dorm space.

Year	Number of Participants
2005	16
2006	21
2007	22
2008	33
2009	24
2010	32

Methods:

Survey Administration:

All data was collected via a survey administered during Fall 2010. The survey was made available in paper and electronic formats. A table was set up for one day at the main entrance of the engineering building and students were invited to participate by taking the paper version of the survey. Invitations to participate in the identical electronic (SurveyMonkey) format were emailed to all Tagliatela College of Engineering students and remained open for data collection for two weeks. To ensure no student took both the paper version and the electronic version, names were tracked. To encourage participation, those who completed the survey received a \$5 gift card and a 10%-off coupon to the campus bookstore.

The survey tool consisted of three parts (Table 1). Part A was comprised of ten demographic questions including questions pertaining to their participation in the Engineering LLC. The questions in this section required response prior to the survey respondent continuing. Part B of the survey had four open-ended questions pertaining to the students' perceptions of the Engineering LLC regardless of whether they had been participants of the Engineering LLC. The last part of the survey, Part C, included four questions with yes/no response format. These questions were targeted at upperclassman, and pertained to their freshman roommates and their study groups.

Table 1: LLC Study Survey Tool

Part A				
Circle one best answer:				
1. Gender:	Male	Female	Trans/other	
2. Year of study:	Freshman	Junior	Sophomore	Senior +
3. Major-Primary academic affiliation				
Engineering	Business	Arts and Science	Criminal Justice	Other
4. Are you a domestic or international student?	Domestic		International Student	
5. Your freshman year did you start at UNH?	Yes	No		
6. Where did you live your freshmen year?				
Residential	Commuter	Long-distance		
7. Are you familiar with the Living Learning Community program at UNH?				
Yes	No			
8. Did you participate in the Engineering Living Learning Community?				

Yes No

9. Did you participate in a Living Learning Community other than the Engineering Living Learning Community?

No Yes, Please specify which one: _____

10. Are you involved in any of the following activities on campus (circle all that apply):

Student Government Varsity Athletics Intramural or Recreational Sports

Sorority or Fraternity Cultural and Performing Arts

Student groups closely aligned with the engineering major such as:

ASME, ASCE, EWB, SWE, NSBE, AIChE, IEEE, IIE

Work study Admissions Team Other (please specify): _____

Part B

Regardless of whether you participated in the Engineering Living and Learning Community, we are interested in your perceptions of the Engineering LLC:

- 1. What do you perceive to be the benefits of participation in the Engineering LLC?**
- 2. What do you perceive to be the drawbacks of participation in the Engineering LLC?**
- 3. Do you think your experience at UNH would have been different if your participant status in the Engineering LLC had been different? If so, how?**
- 4. Looking back, would you still have made the same decision about participating in the Engineering LLC or not? Why?**

Part C

If you are an upperclassman, please answer the following:

- 1. Do you still live with one or more of your freshmen roommates? Yes No**
- 2. Do you regularly work within a study group? Yes No**
- 3. Is this a stable study group that was formed during your freshmen year? Yes**
No
- 4. If you were in the Engineering LLC, was your study group formed from other members of the Engineering LLC? Yes No**

Processing:

Survey responses were downloaded from SurveyMonkey and entered by hand for those surveys administered on paper. Surveys were screened to remove those respondents who indicated that their major was not within the Engineering College. Free response questions were coded by sorting the response into one or more category, as described in Tables 2-5 below. Microsoft Excel was used for statistical analysis.

Table 2: Codes for Text Responses to Question 1

<i>“What do you perceive to be the benefits of participation in the Engineering LLC?”</i>	
Type	Response Examples
A: Engineering community/immersion/support	Getting to know others in the engineering community; Community support; General information about the field of engineering; Living with people the same major/similar interests
B: Forming friendships with other engineering students	Gaining engineering friends
C: Collaboration on homework/studying/projects	Group work/working together for classes; Help with homework and classes from roommates and neighbors/study groups; Better understanding of course material
D: Accessibility of tutor	Tutors; Easy access to tutors
E: Building Facilities	Live in new hall; Better studying areas
F: LLC Programming	Guest lectures; Field trips
G: Promotion of study habits and work ethic	Surrounded by people with similar work habits/ethics; Promoting study habits

Table 3: Codes for Text Responses to Question 2

<i>“What do you perceive to be the drawbacks of participation in the Engineering LLC?”</i>	
Type	Response Examples
A: Social group limited to engineers/LLC members	Living with and getting to know only engineers; Lack of diversity not getting to know people outside of engineering; Can be challenging to meet people from other majors; Students risk becoming unbalanced/not well rounded; Cliques
B: Potential for lack of independence on class work/copying	Too much group work leading to lack of independence; Copying
C: Gender imbalance	Not enough girls; Not enough women participants

D: Time Commitment	Weekly meetings; Draw on study time; Draw on personal time
E: Need to live on campus/facilities concerns	It's not available to commuters; Can't use stairs to get out of building
F: Personality conflicts/challenges with roommates	May be difficult to live with people like yourself; Might end up with someone who's not helpful; Roommates could be anti-social gamers
NA: Non-responses	I don't know; There aren't any drawbacks; I did not participate

Table 4: Codes for Text Responses to Question 3

<i>“Do you think your experience at UNH would have been different if your participation status in the Engineering LLC had been different? If so, how?”</i>	
Type	Response Examples
A: Impact on friends within UNH or engineering, identity with engineering major	Yes, I think so because it would have given me a great opportunity to meet people in the same major and make close friends; Yes, I would have met more engineering majors or at least known them better
B: Impact on academic outcomes	I would be more educated in my major; Would have had better grades; It would be easier to get help with schoolwork
C: Impact on campus involvement	I would have less time for soccer; Yes, I believe it would have negatively affected my schoolwork and my fit on campus
D: Different network of friends	Yes, I would not have met the people I'm friends with now; Yes. Met different people
E: Impact on support system	I would have more support among classmates in engineering classes; Maybe I would not have had such a tough time with my classes if I had been living with people who understood my stresses
F: Impact on living situation	Yes, I might still live on campus and room with LLC members; I'm a commuter so definitely
G: Yes, unspecified	
H: No, various or unspecified reasons	
I: Maybe/Not sure/Response that indicates the question was misunderstood	Do not know; Perhaps, I do not know anything about the program

Table 5: Codes for Text Responses to Question 4

<i>“Looking back, would you still have made the same decision about participating in the Engineering LLC or not? Why?”</i>	
Type	Response Examples
A: Yes, I did not participate in the Engineering LLC, and would not change my choice	I probably would stick with the decision that I made specifically for financial reasons; Yes, because I am a commuter
B: No, I did not participate in the Engineering LLC, but would like to have participated	I would if I knew about it, so I could meet new people; I would have joined had I known of [its] existence
C: Yes, I participated in the Engineering LLC, and would do so again	Yes, it has had a positive impact on me socially and academically; Yes, because it has provided a huge help in my course and I have people with similar interests that live with me
D: Uncertain/Unclear response	I’m not sure; Yes, because I can only benefit from my participation (from a non-participant); No, I'd stick with being in the LLC participating in the beginning of the year (from a participant)

Results and Discussion

In total, 144 responses were collected. Of these responses, nine were removed because students responded that their primary academic major was from outside the Tagliatela College of Engineering, leaving 135 survey responses. The survey results are described below.

General Respondent Demographics:

Year of Study: Freshmen: 50 Sophomores: 29 Juniors: 34 Seniors+: 22

Gender: Males: 108 Females: 26 Trans/Other: 1

Domestic/International: Domestic: 118 International: 17

Freshmen Residence Status:

Residential as freshmen: 86 (81 started at UNH as freshmen)

Commuter as freshmen: 41 (33 started at UNH as freshmen)

Long-distance as freshmen: 4 (None of these started at UNH as freshmen)

No clear response to this question: 5

Most survey respondents (102 of 135) are familiar with the LLC program at UNH, and 48 of our survey respondents (55% of freshmen residents) did participate in the Engineering LLC. Of the 87 students who did not participate in the Engineering LLC, five participated in other LLC programs: Honors LLC, Freshmen Connections LLC, and Forensic Science LLC.

Impacts of Living Learning Community Participation on Roommate Stability:

Participation in the Engineering LLC has an impact on whether or not a student keeps the same roommate. Among upperclassmen, former Engineering LLC participants were most likely to be roommates with someone who was their freshman roommate. A full 63% of those who were Engineering LLC participants kept a freshman roommate (19 of 30), compared with 22% of residents who did not participate in the Engineering LLC (5 of 23). None of the upperclassmen who reported being commuters or long-distance students as freshmen reported keeping one of their freshman roommates. Keeping the same roommate is correlated with Engineering LLC participation, $R = 0.56$, while keeping same roommate is correlated with residential vs. commuter status with Pearson correlation coefficient $R = 0.46$.

Impacts of Living Learning Community Participation on Study Group Participation and Persistence:

Students who participate in the Engineering LLC are more likely to participate in study groups, and these study groups are more likely to persist after the freshman year. Among those students which responded to the inquiry about participation in study groups, 65% of those who have belonged to the Engineering LLC (24 of 37) regularly work in study groups, while only 39% of LLC non-participants (27 of 69) do so. Of those LLC participants who do participate in a study group, 75% of LLC participants (18 of 24) and 37% of LLC non-participants (10 of 27) report that their study group is a stable group that formed during their freshman year. Of those Engineering LLC participants who regularly work in study groups, 88% (21 of 24) of these respondents report that their study group was formed of other members of the Engineering LLC.

Previous work on student perceptions of LLCs reports that some LLCs foster a collaborative study environment, while others do not, perhaps because of the nature of the coursework taken by a given set of students.¹² We have extended this observation by demonstrating that the LLC does increase study group participation among engineering students, and that these study groups persist for years beyond the freshmen LLC experience.

Impacts of Living Learning Community Participation on Student Engagement on Campus:

Those who participated in the Engineering LLC reported participation in an average of 1.826 categories of activities (standard deviation: 0.926). Those who weren't in the LLC reported participation in an average of 1.342 categories of activities (standard deviation: 1.192). Of the

students who were commuters as freshmen (41): Students reported participation in an average of 0.780 categories of activities (standard deviation 0.725).

Student Perceptions of Benefits and Drawbacks of Engineering LLC Participation:

Student respondents identified two primary perceived benefits of participation: Immersion in and support from the engineering community, and collaboration on studying and class work. Sixty-six respondents (49%) identified benefits related to the engineering community, with typical responses including, “It allows fellowship to develop among the students,” and “Meeting people with similar majors, which is helpful for first year students to get to know more classmates.” 44% of respondents (60 of 135) identified the related benefit of collaboration on projects, homework, and other class activities: “Easily forming study groups,” and “You get to live in close proximity to people taking the same classes who also have the same interests as you. It helps [a lot] with school work and projects.” These benefits were recognized by LLC participants and their non-participant peers (60% of LLC participants and 43% of non-participants identified Engineering community as a benefit, while 48% of LLC participants and 43% of non-participants identified class work collaboration as a benefit). Additional perceived benefits of the LLC included: accessibility of tutors (20), friendships with other engineering students (9), an environment that promoted positive study habits and work ethic (7), benefits related to the building facilities and the particular dormitory (4), and LLC programming such as guest lectures and field trips (3).

Of all responses, by far the most common perceived drawback was potential for social isolation and reduced opportunities to meet students of other majors. 53 respondents expressed this concern. “Social isolation to engineering majors only.” “You don’t get as much of a chance to communicate with students from other majors.” This was the most prominent concern for Engineering LLC participants (20/48) and those who did not participate in the Engineering LLC (33/87). Other perceived drawbacks received many fewer responses, such as time commitment: seven respondents overall expressed such a concern, but most of these respondents (6) did not participate in the Engineering LLC. Some typical responses: “It may be time consuming.” “It may take my study time.” The only response in this category from an LLC participant noted that “You start school earlier,” indicating that LLC participants need to move into the halls a few days before their peers. Other responses were: general personality conflicts with roommates (5), too much collaboration on class assignments (4), a disinclination to live on campus or in the particular dormitory facilities (4), and an imbalance in gender (3). A full 37 responses were categorized as non-responses to the question about perceived drawbacks, with such responses as, “None,” “Nothing,” “Are there any?” and “I am not aware of this program.”

Student perceptions on whether and how participation in the Engineering LLC would have impacted their experience at UNH, and whether they would make the same choice again:

When asked if and how their experience at UNH would be different if they had changed their participation status in the Engineering LLC, there was a wide variety in their responses. The most common response type was an impact on academic outcomes, with 27% of respondents (35% of LLC participants, and 22% of non-participants) indicating that there would be some impact on their classes, grades, ease of completing their freshman year, and similar. All of these responses indicated a *positive* impact of the LLC participation on academics, with responses from participants indicating that their freshman year would have been harder, less successful, etc. if they had not participated, and responses from non-participants saying that they would have had better grades, easier access to help, etc. if that had participated. Other affirmative responses that the LLC would have had an impact on their experience include: identification with the university, the particular major, or engineering as a whole (16); different network of friends (13); living situation (4); support system (3); campus involvement (3); and unspecified “Yes” (5).

Some respondents (18%) felt that their experience at the university did not depend on whether or not they participated in the Engineering LLC (24 of 135). There were no clear trends among their responses, which were sometimes very general: “No,” and other times were very specific, for example: “No because I'm in the Freshman Connections LLC so I'm still in an LLC,” “No. In [the Engineering classroom building] we practically live together all day whether we stay in the dorms or not,” “I don't think so, I have done quite well as an adult, commuter student and have stayed on track using my own set of goals.” This response was less common among those who participated in the Engineering LLC (10%) than those who did not (22%).

Student responses to the question asking if they would have made the same choice regarding their participation in the Engineering LLC and why generated a variety of responses as well. Overall, students would make the same choice again (86). Those students who had not participated in the Engineering LLC were split in their responses, with some saying that they would like to have participated (15) and others saying that they would make the same choice again (39). Commuter status was the most common reason for not wishing to participate: “Yes, because I don't live on campus;” “I would because I cannot live at UNH in my current financial state.” Other students enjoyed the variety of people and experiences they had beyond the engineering community: “Yes I would have stayed out of it again because I liked being exposed to students with different majors.” Among LLC participants, it is interesting to note that none of them said that they would not participate if they had to choose all over again, with 47 respondents wishing to participate in the LLC. They cite a rich variety of social and academic benefits from their participation. “Yes, the learning experience was invaluable;” “Yes it made my transition from high school much easier, with making friends and academics;” “Absolutely. I would live in the LLC again without even thinking about it. The benefits outweigh the drawbacks so much, it is not even a question. I would recommend the LLC to any incoming freshmen.” A small minority of student responses (16) were not self-consistent, and so were excluded from the numbers above. This may indicate a need to refine the question for greater clarity.

Students who participate in the Engineering LLC at UNH form a cohesive group. This is reflected in student perceptions of benefits and drawbacks of participation, as well as in the behavior patterns in roommate and study group stability. The most commonly perceived benefits and drawbacks of participation highlight the two sides of this phenomenon: 49% of student respondents identify immersion in the Engineering community as a benefit, while 39% of respondents identify potential for a social life that excludes non-Engineering as a drawback. Considering the elevated levels of participation of LLC students in campus activities and study groups, as well as the positive response from students who did and did not participate in the LLC, the authors assert that on the balance, this experience is a benefit for our students.

Additional questions that can be explored and discussed in future work relate to the question of exclusion of non-participants from the social fabric of the college and perceptions that LLC students are given preferential treatment by faculty, and to the validity of some students' concern that cheating or overly high levels of homework collaboration may lead to lower learning gains among participants. Other studies also point to the importance of the role of culture within an LLC,¹² and further work can explore the ways in which the development of this culture can lead to feelings of exclusion or isolation for some students who do not share the values of that culture.

Conclusions:

The responses generated by students who participated in this survey support much of the previous work to study student experience and academic achievement for LLC members. Engineering student participants benefit from academic support, a sense of community within the engineering program, and access to resources such as faculty liaisons and field trips. They are engaged with extracurricular activities within the Engineering College and in the university as a whole. These students would participate if given the choice to make again, and many non-participants would like to have participated. The nature of engineering coursework leads to students spending a large amount of time working on engineering project teams and taking classes in the Engineering building, so some students do not feel that the LLC would have made an impact on their UNH experience, but this experience may be most beneficial to those students who otherwise might not have had a good transition to college or who would not otherwise have identified strongly with the engineering profession.

Students who do not live on campus for a variety of financial, familial, and other reasons cannot participate in these LLCs, and may be most at risk for being excluded from the social bonds that grow out of the shared residence community. Some strategies for including LLC residents, other residents, and commuters are: a) Forming project teams that are diverse in residence status, particularly in first-year engineering courses, b) Hosting frequent social events to engage engineering faculty and students of all types in interactions outside the traditional classroom, c) Incorporating a "Bring a friend" culture into the LLC by opening some Engineering LLC activities to non-participants.

The results of this survey also show an interesting pattern in the formation and persistence or stability of study groups, as the Engineering LLC participants are more likely than their peers to have study groups, and more likely to have a long-term study group that persists over multiple years at the university. The authors see this as beneficial to the students, and recommend that this be encouraged in LLCs and among students in general. However, this close cooperation among students may lead to opportunities for a breach of academic integrity policies. It is recommended that faculty liaisons, LLC tutors, or other related staff hold a training session with LLC participants to teach them how to form constructive, effective study groups to maximize each person's learning within the study group environment.

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