**Maximizing Academic and Professional
Success: Building Student Learning
Communities That Lead to Engineering
Excellence**

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Abstract

Eight years ago, The William States Lee College of Engineering at the University of North Carolina at Charlotte acknowledged the existence of a retention problem. At the time, the College did not have a formal mechanism in place to measure retention but it was obvious that graduation rates were down and the proportion of underrepresented minority graduates was shrinking. There was no assessment process in place to identify at what point students dropped out, where they were going, why they were leaving, and what could be done to reverse the trends. An innovative solution was needed – one that would satisfy the needs of the diverse student population in a growing, urban, public institution striving to expand its mission to include a sizeable research agenda. Any proposed solutions would also have to be integrated with the ABET EC 2000 criteria, yet be flexible enough to adapt to a changing academic, economic, and political environment. In addition, a drastic culture change was needed. The mentality that students “sink or swim” still lingered, there was considerable skepticism about the cost/benefit of student support programs, and students were accustomed to a competitive environment that awarded individual rather than team success. In addition, limited resources meant that whatever was implemented needed to be credible, sustainable, and productive. Hence, several “student learning communities” have been implemented that are designed to provide a successful learning environment, which attracts and retains qualified students.

Introduction

The Lee College of Engineering Learning Communities programs focus on activities that promote the formation of learning communities. According to Love and Tokuno¹ students in learning communities:

- Take the same classes.
- Form study groups for their courses.
- Spend time socializing outside class.
- Share strategies for success.

- Collaborate on class activities and assignments that require them to work together and intentionally practice skills such as communication, cooperation, and/or conflict resolution.

The first learning community created within the College of Engineering was *MAPS (Maximizing Academic and Professional Success)*. The program was initially developed and implemented with seed money from the NSF funded Southeastern University and College Coalition for Engineering Education (SUCCEED) and internal funds but, over the last several years, has been fully institutionalized within the College. *MAPS* has several features that make it unique and distinct from other engineering retention programs. First, it is a mainstream program that is available to *all* undergraduates in the College and, therefore, does not target one specific student population such as women, minorities, or freshmen. Second, participation in the program is voluntary and students may stay in the program their entire academic career. Most other retention programs typically invite or require students to participate during their first year only. Third, the program was developed with significant input from students and is still operated, assessed, and continuously improved by students with faculty oversight. This approach has proven to have other benefits besides optimizing use of resources. Students involved in the program have assumed *ownership* for its success. They also have the opportunity to develop non-technical skills highly valued by employers, such as leadership, project management, communication, and teamwork skills. Fourth, the program recognizes and addresses critical transition stages experienced by students during their undergraduate career. Most other retention programs focus on students' transition '*in*' only. *MAPS* provides a comprehensive, integrated program that begins in the freshman year, follows up by providing support in the sophomore year when students enroll in "gateway" engineering courses, and then closes the loop on the transition process by helping to prepare students to enter graduate school and/or the work place. Fifth, *MAPS* focuses on academics. Any social networks that develop are purely a result of student learning communities, and not vice versa, as is the case with many other retention programs. Lastly, the program is assessment-based. By sharing assessment results and proactively soliciting feedback for improvement, *MAPS* has gained credibility and support, as evidenced by the fact that it is fully institutionalized within the College of Engineering. The latter is particularly important as 2001-02 was the last year of NSF SUCCEED funding.

MAPS offers peer mentoring, Supplemental Instruction (SI) for gateway courses, tutoring, study groups, skill development workshops, professional development activities, and a technical and professional development resource library. *MAPS* is also intricately integrated with academic advising, the freshman engineering curriculum, and the junior/senior professional development courses. Continuous improvement is driven by assessment results including, but not limited to, demographics, academic performance, percent of students earning a D or an F or withdrawing from key gateway courses (DFW rates), retention rates, workshop evaluations, student surveys, focus groups, and faculty and alumni interviews. Two components of the program, namely peer mentoring and SI, have proven to have a significant impact on freshman-sophomore and sophomore-junior retention in the College of Engineering.

MAPS Peer Mentoring

Peer mentors are academically successful juniors and seniors who are specially trained to teach and help students implement effective study, test taking, time management, organization, planning, and networking skills. Mentors meet with groups of 3-4 students, who are enrolled in similar courses, for one hour per week throughout the semester. Students voluntarily participate in mentoring for as many semesters as they feel they need the support. In some cases, probationary students are required to regularly meet with a mentor as a condition of continued enrollment or readmission to an engineering program. Generally, though, only about 5% of the participants are required to attend *MAPS* in any given semester. Virtually all of the students participate on a purely voluntary basis.

Mentors provide a variety of support mechanisms and regular, constructive feedback to ensure that students are achieving their academic and professional goals. They mentor by example and serve as role models. The primary focus of peer mentoring is academic rather than social. The social elements are a result of the natural evolution of academic learning communities, rather than the reverse. Mentors work from a formal weekly agenda, with specific learning outcomes identified for each session. Every mentoring session is designed to build upon previous sessions so that students have the opportunity to apply and master the academic strategies necessary for success in the College.

Among the topics covered in the mentoring sessions are: goal setting; learning styles; introduction to the College's computer system; GPA calculation; internships, co-ops and undergraduate research opportunities; scholarship information; and study and test taking skills. During a day and half long training session, mentors are provided with a resource handbook that they can use for each of the sessions. The mentor team meets for one hour each week with the director of *MAPS* to obtain additional training, discuss students' progress, resolve issues before they become problems, and identify opportunities for improvement.

More than one hundred students participate in peer mentoring through *MAPS* each year. Strategic marketing and generous word-of-mouth advertising by students have exceeded expectations relative to demand. Figure 1 provides the number of participants since the program's inception in 1996. Unfortunately, the low rates during the last semesters were a result of budget delays. Because the state of North Carolina did not approve its budget until mid-way in the fall '01 and fall '02 semesters, *MAPS* did not know how many mentors it could hire and, therefore, how many mentees could realistically participate in the program. Consequently, any marketing that was normally done in the summer and early in the fall semester was extremely curtailed. Figures 2 and 3 present the demographic breakdown of the participants for the last three years. In general, the demographics of students participating in peer mentoring are representative of the general undergraduate student population in the College.

Figure 1: Total # of Students Attending at Least One MAPS Mentoring Session Each Semester

Figure 2: Gender of Students Participating in MAPS Mentoring

Table 1 provides *MAPS* retention and graduation rates, which are calculated by tracking students by individual social security number. Results shown in this table include all students who attended *MAPS* at least one time per semester and were retained in or graduated from the College of Engineering. The data also include students who participate in *MAPS* mentoring but who are not College of Engineering majors. Students taking College of Engineering courses are allowed to take advantage of the *MAPS* program and they may decide not to pursue a College of Engineering degree. Table 2 shows UNC Charlotte College of Engineering retention and graduation rates for freshmen who came in fall of 98 and became sophomores or graduated by the spring of 2003 with College of Engineering majors. Fall 98 data was chosen because most students in the College of Engineering need more than four years to graduate. In comparison, national retention trends suggest that about half of the students who start out in engineering successfully complete their first year and about the same percentage actually complete their degree². According to a study from the National Center for Education Statistics, the graduation rate for females, in general, is better than for males. After five years, almost half of first-year female science and engineering students complete their degree compared with about 40% of the males. However, for underrepresented minority students the graduation rates diverge considerably from that of whites and Asians. Only 27% of underrepresented minorities complete science and engineering programs, compared to more than 46% of whites and Asians³.

As shown in Tables 1 and 2, 44% of the freshmen participating in *MAPS* mentoring graduate with a College of Engineering degree compared to 30% of the freshmen who do not participate in *MAPS*. African American students who participate in *MAPS* are twice as likely to graduate with an engineering degree compared to national statistics and to students not participating in *MAPS*. In general, students who attend *MAPS* are close to twice more likely to graduate from the College of Engineering than non-participants.

Table 1: Retention Rates for Students Participating in Peer Mentoring

	All	Freshmen	Transfers	Females	African Americans
1 Year Retention Rate	86%	84%	88%	86%	89%
2 Years Retention Rate	59%	50%	66%	55%	62%
Graduation Rate	63%	44%	68%	54%	56%

Table 2: Retention Rates for All Students in the College of Engineering

	All	Females	African Americans
Freshman to Sophomore Retention	51%	46%	50%
Freshman Graduation Rate	30%	31%	21%

In fall 99, a new attendance tracking method was implemented. Assessment results indicate that both retention rates and GPA increase as the number of mentoring sessions attended increase. Attending eight or more mentoring sessions per semester seems to be the optimal number for students to get the most out of *MAPS* peer mentoring. The average two-year retention rate for students attending *MAPS* mentoring eight or more mentoring sessions is 75%. GPAs for students participating in *MAPS* are also tracked. The average GPA of students attending at least one mentoring session is 2.600 compared to 2.270 for all freshmen in the College of Engineering. For students attending at least eight mentoring sessions per semester, the average GPA goes up to 2.900. African American and female participants who attend at least eight mentoring sessions each semester (every other week) earn an average GPA of 2.800 and 3.000, respectively. These results indicate that peer mentoring is having a positive impact on academic performance and retention of engineering students. Students are encouraged by faculty, advisors, and fellow students to periodically attend mentoring.

MAPS Supplemental Instruction (SI)

The *MAPS* Supplemental Instruction (SI) program follows the national model developed at the University of Missouri-Kansas City⁴. SI is a non-remedial program that utilizes students led review sessions and focuses on courses with high DFW rates. Because SI is not a remedial program, *all* of the students enrolled in these courses are encouraged, but not required to attend sessions. For over 17 years, SI has been offered at UNC Charlotte at the university level. Only during the last seven years has it become available in the College of Engineering.

The assessment process is composed of a mix of quantitative and qualitative analyses including student, SI leader, and faculty feedback; attendance rates; final course grades; and DFW rates. Assessment results indicate that SI is making a statistically significant positive impact on final course grades and on DFW rates. Students believe that SI plays a key role in helping them build

learning communities and study groups. Qualitative feedback from faculty indicates that SI participation is often the determining factor in whether or not a student repeats a course.

The philosophy, format, and objectives of SI are different from tutoring, problem sessions, recitation, and group study in several ways. First, SI focuses on high-risk courses, not on high-risk students. The courses selected for SI are those in which, traditionally, 30% or more of the students receive a final course grade of D or F, or withdraw from the course. Second, SI does not use a one-on-one format, but rather promotes and facilitates collaborative learning. Third, unlike group study, a specially qualified and trained peer leads the SI sessions. Fourth, SI leaders do not work problems for students. Instead, SI leaders skillfully teach students *how to learn* by introducing them to and helping them apply academic success strategies.

Students who have previously made an “A” in the course qualify to be an SI leader. Applicants are interviewed by the director of MAPS and the course instructor(s) and are selected based on their technical competency, communication skills, and ability to work as part of a team. SI leaders are paid a small stipend and, typically, are contracted for 10 hours per week:

- three hours attending class
- one hour participating in the SI leader team meeting
- two hours preparing for SI sessions
- four hours conducting SI sessions

In order to maximize the potential of SI leaders, it is essential to provide them with adequate program orientation and ongoing training. Thus, all SI leaders complete a two-day training under the supervision of the University’s SI coordinator before the beginning of the semester. The training includes topics related to how students learn, instructional strategies aimed at strengthening student academic performance, and mock SI sessions. The structure of the training sessions are in a format similar to the SI sessions, but the agenda also includes topics relevant for preparing leaders to facilitate their sessions and troubleshoot some of the predictably difficult situations. Weekly interaction with veteran SI leaders is critical to the development of new SI leaders, regardless of the courses they are supporting. The skill to successfully “re-direct” student questions is common to all good SI leaders. This strategy initiates collaborative learning, which may then be translated into the study habits of the students throughout their other courses. According to one student who attended SI sessions, “You learn, in the session, about the thinking and learning styles of others and alliances easily emerge. The small group atmosphere is just conducive to interpersonal connections.”

Despite the fact that he or she has already passed the course with an “A,” the SI leader is required to attend class so that: (1) the SI leader can observe what material is taught and how; and (2) the SI leader can identify concepts which may cause the students trouble. The latter is particularly important in the SI leader’s preparation and for providing real-time feedback to the course instructor. During the sessions, the SI leader does not “re-lecture” class material or work problems for the students. Rather, the SI leader teaches the students *how to learn* by coaching and guiding them through the understanding of and application of concepts. By facilitating discussions on how to draw system schematics, understand and use basic equations, and identify appropriate assumptions, the SI leader helps the students move beyond a “plug and chug”

mentality. Based on feedback from course instructors and students who have participated in SI, peer-led sessions are effective in that students are more likely to ask questions, participate in group discussions, and take the lead in solving problems. Thus, SI provides a proactive environment in which SI leaders and students together compare notes, work problems, develop organizational tools, predict test questions, and have discussions about the course content. As a result, students identify and/or develop customized academic strategies to succeed in high-risk technical courses.

While SI promotes student interaction and collaborative learning, it also fosters a healthy interdependence, particularly evident when students learn by teaching others and when new perspectives and insights (whether correct or incorrect) are shared within the group. It is obvious that SI sessions also lead to the formation of study groups, which is one of the major strategies for ensuring persistence and improving retention.

College of Engineering attendance rates consider only those students who have attended five or more SI sessions per semester. Although many models use three or more sessions as the benchmark, it was determined that the more stringent standard would lend credibility to results and perhaps prevent allegations that students were more likely to attend only before tests. Attendance statistics indicate that sessions are comprised of students who are academically at-risk and others who are simply trying to improve their performance⁵.

Figures 4 and 5 compare the percentage of students, by gender and ethnicity, respectively, attending SI five or more times versus those who do not. The data reveal that there is virtually no difference in terms of who attends SI. It is interesting to note that the demographics of the students who attend SI are reflective of the demographics of general population of the college.

Figure 4: SI* vs. Non-SI Gender

Figure 5: SI* vs. Non-SI Ethnicity

As shown in Figure 6, between 20% - 40% of the students attend five or more sessions each semester. Assessment results also indicate that SI is making a statistically significant positive impact on final course grades and DFW rates. In fact, students who attend five or more SI sessions in a semester typically earn one half to one letter grade higher than students who do not attend SI as frequently. Within the last couple of years, the College has worked with the departments of chemistry, math, and physics to also offer SI for these courses. As Figures 7 and 8 show, the addition of SI improved students' academic performance in these challenging freshman courses as well as in "gateway" sophomore engineering courses like statics, solids, and network theory.

Figure 6: % of Class Attending 5 or More SI Sessions in F02-S03

Figure 7: SI* vs. Non-SI DFW Rates for F02-S03

Figure 8: Average Final Course Grades for SI* for F02-S03

The engineering department chairs have been delighted with these SI results. As a result, in fall of 2001, they agreed to assume SI funding for sophomore-level engineering courses so that

MAPS funding could be reallocated to additional SI for chemistry, pre-calculus, calculus, and physics. They also requested that SI be provided for selected junior engineering courses and they committed departmental funds to make this possible.

Benefits to Mentors and SI Leaders

As Astin concludes in his groundbreaking research in What Matters in College, "The student's peer group is the single most potent source of influence and growth and development during the undergraduate years⁶." Thus, the networks that they develop early in college play a critical role in their academic performance and retention. This is especially true for engineering students who traditionally are competitive in nature, prefer to work alone, and are not comfortable asking for help. The mentor/mentee relationship is one that is built on trust, respect, and mutual goals. Mentoring truly benefits not only the students at the receiving end, but also the mentors themselves. Mentees learn from experienced role models who are committed to their success. They receive coaching and guidance in a safe, caring community of learners. Mentors develop a better understanding of learning styles and theory, retention statistics, transitional issues, how to conduct meetings, effective communication and project planning skills, and how to relate to students of different backgrounds, age, ethnicity, and classification. Through their training and application, mentors have the opportunity to develop many of the professional skills that will be critical to their success in the workplace. They also become more personally involved with the College as they achieve a greater understanding of the College's mission and contribute to the attainment of those goals. Many times the input of mentors is solicited through focus groups, for example when the College develops new programs or when hiring new administrators. Thus, they have a strong sense of ownership in terms of the *MAPS* program and their overall contributions to the College.

Without question, both students and faculty respond to SI very well. Though this is very difficult to quantify, the feedback is obtained through surveys issued to students at the beginning and end of each semester and to course instructors at the end of the semester. In addition, focused individual interviews are held with students and instructors. Faculty members do not usually attend or participate in SI sessions, but they interact with both the SI leader and students on a regular basis. Offering the faculty a chance to communicate their perception of the program has provided greater opportunities for improvement by program administrators. When asked what they perceive to be the primary benefits of SI to the students, one faculty member wrote, "It gives them another window into the course, and it builds their self-confidence, [which is] critically important with about half the students." Faculty members are finding the numerous benefits of peer-to-peer facilitated study sessions and are showing increasing support for the SI program. Other comments provided by faculty members include the following:

- "Better understanding of the course material, including many aspects of A.C. circuit theory. Better active learning experience for the students than could be conducted in a lecture class. Collaborative learning at its best."
- "Extra exposure to subject material. Also, opportunity to ask questions."
- "A non-threatening chance to ask questions in a setting where it had no possibility of impacting their grade"

Surveys issued to the students at the beginning of the semester are used to determine their interest in attending SI sessions, reasons for not attending, expectations for study requirements and final course grade, and demographics (age, classification, etc). These results are used for continuous improvement of the program.

After the instructor has agreed to use an SI leader and the SI leader has completed the one and a half training session, the program must be sold to the students. This is an important issue in engineering because of the competitive nature of the discipline. Again, support from the instructor is critical because the students will automatically value that which the instructor actively promotes as helpful to improving their grade and/or successfully completing the course. Students need to understand that SI is not a remedial program and not a tutoring session. The best way to describe a session is to attend one and experience the collaboration and energy it produces.

Regular assessment and continuous improvement of the program is critical for obtaining support, both in terms of funding and other resources, and for ensuring the long-term sustainability of the program. Specific data regarding attendance rates, DFW rates, retention statistics, and other relevant information, such as who attends SI and why, can help identify specific areas of concern and justify the cost/benefits of the program. It should also be emphasized that reporting the bad with the good also lends credibility to the process and presents an opportunity to seek input from faculty and students.

Freshman Learning Community

In fall 2002, the first College of Engineering residential Freshman Learning Community (FLC) was implemented. The FLC is designed to encourage freshmen to achieve academic excellence with the support of a tight-knit community of persevering students, dedicated staff, and involved faculty. The FLC is a one year program open to all incoming freshmen. Participation is voluntary and since its inception there have been more applicants than spaces available. In fact, there has been a waiting list in both of the first two years. In fall 2002, there were 60 participants and this year 96 students are participating in the FLC. In response to the great demand, the program will expand to 120 participants in fall 2004.

Students participating in the FLC are placed in a common area of a residence hall with College of Engineering resident advisors (RA). The freshmen in the community have common class schedules and have a common academic advisor. In addition, the Introduction to Engineering Practices and Principles I (ENGR 1201) and the English Composition classes are offered in the residence hall. The ENGR 1201 course is taught by the Director of the Program who keeps the students abreast about upcoming activities and important dates as well as monitors the progress of the students and the program. A student lounge is equipped with white marker boards, tables and chairs, and a technical resource library to encourage students to form study groups with their peers in the residence hall.

The main focus of the program is academic. An extension of the MAPS program services are offered to FLC participants. At the beginning of the semester, all FLC students are assigned a mentor, however, attendance is voluntary. SI and review sessions are offered in the residence

hall for Calculus I and Chemistry in the fall and for Calculus II and Physics I in the spring. Historical assessment results indicate that compared to sophomores, freshmen are less likely to attend SI or ask for help. Therefore, in fall 2004 SI was offered in the residence hall for Chemistry and Calculus I for the first time and, as expected, an improvement in SI attendance was observed. In addition to SI, just-in-time workshops like *How to Register for Classes* and *How to Write Engineering Reports* are also offered in the residence hall. These support services are readily available and highly visible, thus encouraging freshmen to take advantage of important resources designed to help them successfully transition into College.

Continuous improvement of the FLC is driven by assessment results such as demographics, academic performance, percent of students earning a D or an F or withdrawing from key freshman gateway courses (DFW rates), retention rates, student surveys and focus groups. Preliminary assessment results indicate that students participating in the FLC in the 2002-2003 academic years earned a 2.490 average cumulative GPA. In comparison, the average cumulative GPA of all College of Engineering freshmen at the end of the spring 2003 semester was 2.400. The cumulative average GPA of College of Engineering students who also lived on campus but did not participate in the FLC was 2.361. The first year retention for students in the FLC was 67%. In comparison, only about half of the College of Engineering entering freshmen get promoted to sophomores. Student survey results indicated that students in the 2002-2003 FLC consistently had higher ratings on learning community benchmark questions compared to other freshmen in the College of Engineering as shown in Figure 9.

In the early stages of the program, a few social elements were included as part of the FLC activities to give students opportunities to develop connections with their peers. However, attendance to these activities was relatively low. Therefore, resources were redirected toward academic support rather than social events. Nevertheless, as indicated by the students' responses to the 2002-2003 FLC survey, the social connections were formed as a result of the academic component. For example, survey results indicated that 75% of the students who participated in the 2002-2003 FLC were planning on rooming with FLC students in the following year and 85% of the students indicated that they met outside of class with other FLC students.

Qualitative feedback obtained via focus groups revealed that participating in the FLC promotes collaborative learning, helps students stay more focused on their assignments, facilitates the development of connections with other students, and encourages students to take responsibility for each other. Several 2002-20003 FLC participants who are now sophomores have been hired as MAPS mentors, SI Leaders, and ENGR 1201 (Introduction to Engineering) teaching assistants. These students indicate that after just one year they have established a strong connection with the College community and already desire to "give back" to help others.

ENGR 1201: Introduction to Engineering Practices and Principles I

Introduction to Engineering Practices and Principles I (ENGR 1201) provides a way for all College of Engineering students, freshmen or transfers, to be a part of a learning community. ENGR 1201 is a required course that introduces students to the engineering disciplines, the college's computing system, the design process, teamwork, oral and written communications, and personal and professional development strategies. The majority of the course is dedicated to a multi-disciplinary team design project that culminates in a formal report and presentation at the end of the semester. Experienced students, usually juniors and seniors, are carefully selected to be teaching assistants/project managers for the course. In this role, the TAs also serve as mentors and role models, both critical components for a successful first-year experience. In addition to getting to know upperclassmen, students in ENGR 1201 get introduced to College of Engineering faculty: Faculty members from each of the engineering disciplines conduct lectures on what does it mean to major in a specific discipline; and each team's final presentation of their conceptual design is evaluated by two members of the college faculty.

Prior to spring 2002, departmental faculty were assigned to teach ENGR 1201 on an annual rotation basis. This structure did little to encourage faculty-student interaction. In addition, more than 200 students were enrolled in each section which did not give the opportunity for developing meaningful student-student interactions. Based on college faculty recommendations, dedicated faculty have been assigned to teach ENGR 1201. It was also recommended to drastically reduce the section sizes. Currently each section has about 40 students. Assessment results have yet to confirm the impact of these changes on student learning outcomes and learning communities. However, preliminary results are encouraging. For example, Figure 10 suggests that these changes may be having the desired effect relative to the students' interaction with the faculty and interaction with other students.

Figure 10: ENGR 1201 Learning Community Survey Results

Centralized Freshman Advising

In Fall 2002 a newly organized centralized freshman advising team was formed. The team is composed of the Faculty Associate for Recruiting and Advising, the Faculty Associate for Academic Programs, and the two recently hired Faculty Associates for Freshman Engineering and Advising. Each freshman is required to meet with an advisor prior to registration of courses. The advisors monitor academic performance, make interventions as appropriate, and provide career exploration guidance. They also ensure that students understand the curriculum requirements, progression requirements, advising process, and registration process. The advising team develops block schedules for the fall semesters to help freshmen establish an early learning community. This advising structure ensures a common first-year experience, provides a single-point-of-contact in the formative first year, and maintains consistency in terms of information and process for all freshmen. As with the some of the changes in ENGR 1201 and the FLC, this effort is still too new to assess its impact.

Summary

In summary, the UNC Charlotte Lee College of Engineering *Learning Communities* are an innovative, comprehensive approach to improving retention, and helping students develop technical *and* non-technical skills necessary for their professional success. Developed with

significant input from students, *MAPS*, the FLC, the introductory engineering course and centralized freshman advising represent a comprehensive, holistic, and integrated approach that teach students how to learn, get connected, and establish a professional identity in the freshman year, followed by support in the sophomore year when students enroll in “gateway” engineering courses.

Assessment results reveal that *MAPS* and the FLC are having a significant impact on the academic performance and retention of participants. In general, participants perform better academically and are twice as likely to graduate from the College of Engineering as the general undergraduate population. Initially developed and implemented with seed money from NSF SUCCEED, the success of the students in *MAPS* has resulted in an expansion of the program and its full institutionalization within the College. The *MAPS* success story inspired the creation of the FLC for which the participation is expected to double by fall 2004. New faculty associates were hired to provide personalized advising and to teach ENGR 1201. The Lee College of Engineering provides opportunities for students to explore their talents, achieve their goals, and ultimately reach their potential through its learning communities. The *MAPS* program, the FLC, the introductory engineering course, and centralized freshman advising provide an environment conducive for building communities of learning that include students, staff, and dedicated faculty. These programs have proven to be great tools for improving retention and for maximizing student success.

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