

AC 2010-759: OVERVIEW OF LOUISIANA STATE UNIVERSITY'S STEM TALENT EXPANSION PROGRAM, ENGINEERING ENGAGEMENT FOR STUDENT SUCCESS

Summer Dann Johnson, Louisiana State University

Ms Dann is currently employed by the Dean's office at LSU as the STEP program manager. Ms. Dann earned her bachelor and master degrees in Mechanical Engineering at LSU and was employed in private industry prior to her current position.

John Scalzo, Louisiana State University, Baton Rouge

Mr. Scalzo is the Associate Rector of the Engineering Residential College and an instructor in the Department of Electrical Engineering. He earned his bachelor degree in electrical engineering from Virginia Tech in 1992 and a master's degree in electrical engineering from Georgia Tech in 1993. Mr. Scalzo was employed in private industry prior to his employment at LSU.

Warren Waggenpack, Louisiana State University, Baton Rouge

Dr. Waggenpack is currently the Associate Dean for Engineering Undergraduates and holder of the Ned Adler Professorship in Mechanical Engineering at Louisiana State University. He obtained both his baccalaureate and master's degrees from LSU ME and his doctorate from Purdue University's School of Mechanical Engineering. He has been actively engaged in teaching, research and curricula development since joining the faculty in 1988.

Kelly Rusch, Louisiana State University, Baton Rouge

Dr. Rusch is the Associate Dean for Diversity in the College of Engineering. She is a Full Professor in the Department of Civil and Environmental Engineering. She is the Formosa Plastics Endowed Professor and has been active in researching waste water treatment, aquaculture and biodegradation of plastics in the environment.

Gerald Knapp, Louisiana State University, Baton Rouge

Dr. Gerald M. Knapp, P.E., P.E., Fred B. and Ruth B. Zigler Associate Professor of Engineering, is an associate professor of industrial engineering and IE Undergraduate Coordinator at LSU. He holds a B.S. and M.S. in Industrial Engineering from SUNY Buffalo, and a Ph.D. in Industrial Engineering from the University of Iowa. Dr. Knapp is an ASQ Certified Reliability Engineer (CRE) and a registered Professional Engineer in the State of Louisiana. Dr. Knapp's specialization is in information systems & technologies, currently in the area of semantic analysis (a subarea of natural language processing).

Roger Seals, Louisiana State University

Dr. Seals is Professor Emeritus of Civil and Environmental at Louisiana State University. He obtained both his baccalaureate and master's degrees from the University of Florida and his doctorate from North Carolina State University. He has been actively engaged in teaching, research and curricula development during his tenure at West Virginia University, 1965-1980, and Louisiana State University, 1980-2005. He served two years as a Program Director in the Division of Undergraduate Education, National Science Foundation.

Overview of Louisiana State University's STEM Talent Expansion Program, Engineering Engagement for Student Success, ENG²

Abstract

The Louisiana State University (LSU) College of Engineering's ENG² Project is designed to increase the number of engineering and construction management graduates through retention programs aimed at developing and maintaining a sense of community among the students and faculty, enhancing academic skills of the students, and providing a framework for interactions between faculty, students and industry personnel. The project hosts three main programs: a Faculty Development Workshop, the Encounter Engineering Bridge Camp (E²), and a freshman course, ENGR 1050 Introduction to Engineering. The project also hosts several of its professional development and academic enhancement activities in the Engineering Residential College (ERC), a residential hall for freshmen. Finally, the project is expanding Peer Mentoring, which emerged from the bridge camp team captains, and now is incorporated into ENGR 1050.

Assessment includes individual program elements and overall impact on retention. Feedback on the individual components includes surveying the attitudes and value of the various activities by the participants, instructors and other personnel. The ENGR 1050 course and the Peer Mentoring program were assessed by an outside evaluator. The overall project impact includes tracking the graduation and attrition rates of all students, comparing these rates between programs and to a control, obtaining attitudinal and perception feedback from student surveys on program components and independent observations of faculty and an outside evaluator. Based on the 2 years of data for Cohort 1 (07/08 AY) and 1 year of data from Cohort 2 (08/09 AY), preparation for calculus appears to be the positive significant factor in retention in the College of Engineering and the university. Participation in the camp and ENGR 1050 is also positive. Overall students who participate in any ENG² program activity have a higher retention in the College of Engineering and in STEM programs than those who do not participate. This manuscript describes the main ENG² program elements and their assessment in detail as well as the retention data for 2 cohorts.

Background

Research has shown that engineering retention and graduation rates are enhanced through first year experiences that actively incorporate and engage faculty and students (1-7). From the behaviorist perspective, participants involved in activities that utilize hands-on inquiry and active learning strategies, demonstrate that continued learning and a sense of community has occurred by manifesting enduring change in observable behavior, such as changes in attitudes, higher GPA's and retention in the college, and active involvement in their respective student organizations, relative to a cohort group with similar aptitude and incoming test scores. Many behaviorists suggest that very few incoming freshmen reached the "formative operational stage" of learning. (8- 9) The "formal operation stage" is defined by Jean Piaget (1896-1980) as the ability to use symbols in abstract concepts. Piaget asserted that the stages of mental cognition are based on biological age; whereas Bruner suggested that each stage is present and necessary for learning. Learning is therefore a process of motor activity or rote task, developing images to

represent past experiences and then using images and symbols to develop analogies for the past and predicting the future.

In general, students entering the university have great difficulties recognizing the connection between the physical world and the theoretical concepts, manipulating variables and solving problems “without numbers” presented in first year courses. The lack of reaching the formal cognitive level, appears to lead to the inability to excel in first year courses and is expressed as an increased level of frustration, lack of confidence in their abilities, extreme dislike of the professor and inevitably, of those completely frustrated and disillusioned, a transition into another field of study. Based on this premise, the STEM Talent Expansion Project at LSU, funded by the National Science Foundation, has focused the majority of its efforts into the first year experience of incoming freshmen in order to increase retention and ultimately graduation rates in the College of Engineering. (10) This has been achieved by creating and working a sustainable model within the college that builds connections, promotes a sense of community and incorporates hands on inquiry and active learning strategies.

Introduction

LSU Engineering’s ENG² Project has now hosted its main program components for three years. These include a Faculty Development Workshop (FDW), Encounter Engineering, a bridge camp for incoming freshmen, and a first semester course ENGR 1050 Introduction to Engineering. The overall goal of the ENG² project is to increase the retention of freshmen and sophomore students in the College of Engineering. In addition to monitoring retention rates, assessments include focus groups and attitude surveys given at the end of the programs asking for both perceived interest in and value of the various activities. This feedback has provided the basis for improvement of the individual components. The faculty and staff organizing and implementing the activities also meet on a regular basis to discuss the successes and challenges of each to enable real time modifications. Overall for 2009, approximately 1/3 of the incoming freshmen engineering and construction management students participated in some aspect of the ENG² program; this number also includes ENG² activities hosted in the Engineering Residential College (ERC).

In addition to the freshmen programs, upper level students participated in ENG² activities through Peer Mentoring which originated from the E² bridge camp team leaders. The number of peer mentors increased in 2009 to accommodate the larger number of students in the bridge camp and to include mentoring students in the ENGR 1050 course. The majority of these peer mentors are past participants of the Encounter Engineering camp.

Program highlights and assessments, to date, are presented in this manuscript.

Faculty Development Workshop (FDW)

The goal of the three day Faculty Development Workshop is to equip faculty members with tools and strategies that engage the students in their courses to improve learning, critical thinking and persistence of the students in engineering. The original collection of faculty/instructors invited to participate in the 2007 FDW were those teaching a freshmen level course in the approaching academic year. For the 2008 and 2009 FDW, the ENG² team also invited new faculty, < 2 years teaching, and those scheduled to teach courses for the ERC. Faculty and instructor participants for the faculty development workshops are recommended by

their chairs and by past FDW participants. In the 2009 FDW, twenty three members from the Colleges of Engineering, Basic Sciences and Arts and Sciences developed new learning strategies to improve their STEM courses and brainstormed ways to engage students in their classes. Since 2007, fifty-five faculty members and instructors from the Colleges of Engineering, Basic Sciences and Arts & Sciences have participated in an ENG² Faculty Development Workshops. The majority of the participants have taught for 5 years or less, see Chart 1 showing data for 2009.

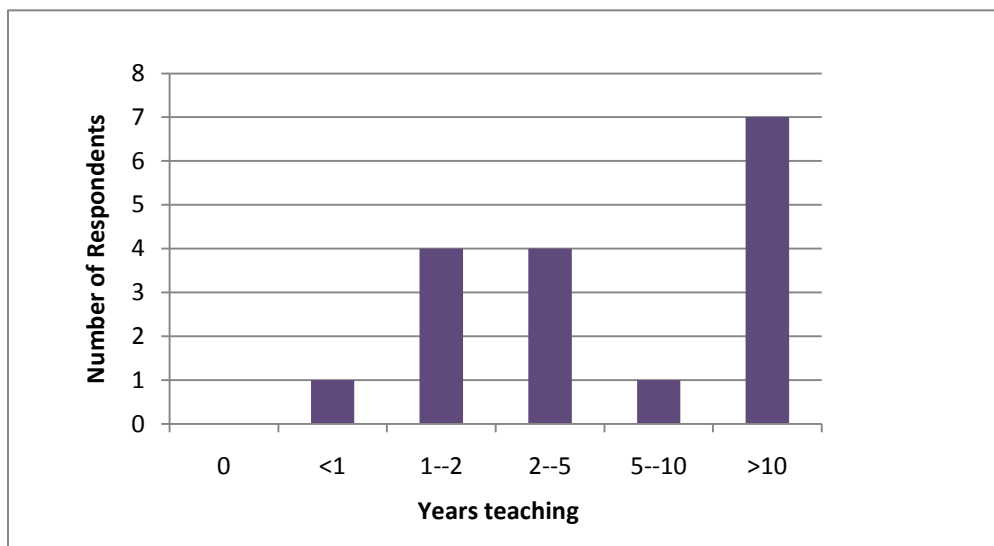


Chart 1. Teaching Experience of FDW Participants

The Faculty Development Workshops are facilitated by experienced and nationally recognized STEM educators. The list of previous facilitators is presented below:

- 2007 Dr. Karl Smith, Cooperative Learning Professor of Engineering Education, Department of Engineering Education, Purdue University
Dr. Ron Miller, Professor, Chemical Engineering Department, Director, Center for Engineering Education, Colorado School of Mines
- 2008 Dr. Michael Prince, Professor of Chemical Engineering Bucknell University
- 2009 Dr. Rebecca Brent, President, Education Designs, Inc., North Carolina
Dr. Richard Felder, Professor Emeritus, Department of Chemical Engineering North Carolina State University

In each workshop, the participants were introduced to an array of topics on how to engage students, implement active and cooperative learning strategies in their courses, how to prepare and structure problem based learning, and assessment techniques for these types of courses. On the final day of the 2008 and 2009 workshops FDW alumni gave “Lessons Learned” presentations and new participants gave brief presentations on the course and topic they plan to implement with active learning strategies.

As with previous years, upon completion, faculty participants were presented with a certificate; a letter and a copy of their certificate were sent to notify their chair of their participation. Chairs were encouraged by the Dean of Engineering to acknowledge the Faculty Development Workshop in the faculty and instructor annual reviews. In addition to the recognition, faculty and instructors who participated in the FDW were provided a stipend of \$800.

Several participants of the Faculty Development Workshop were recruited to teach at the summer bridge program. Other instructors and presenters for the bridge camp included the Engineering Communication Studio Director, the Faculty Advisors for each department, faculty and staff with the Engineering Diversity office and the faculty and instructors of the courses designated for the Engineering Residential College.

Faculty participants are surveyed at the conclusion of the workshop and asked to rate the activities, strategies presented, presenters and other topics. The results of the 2009 FDW survey are presented in Chart 2. The presenters and the content ranked the highest with 4.9 and 4.8 out of 5, respectively. The lowest ranked topic was the visual presentation of the content. Eighty eight (88) percent of the faculty would highly recommend the workshop to a colleague. Ninety four (94) percent felt adequately prepared for their presentations.

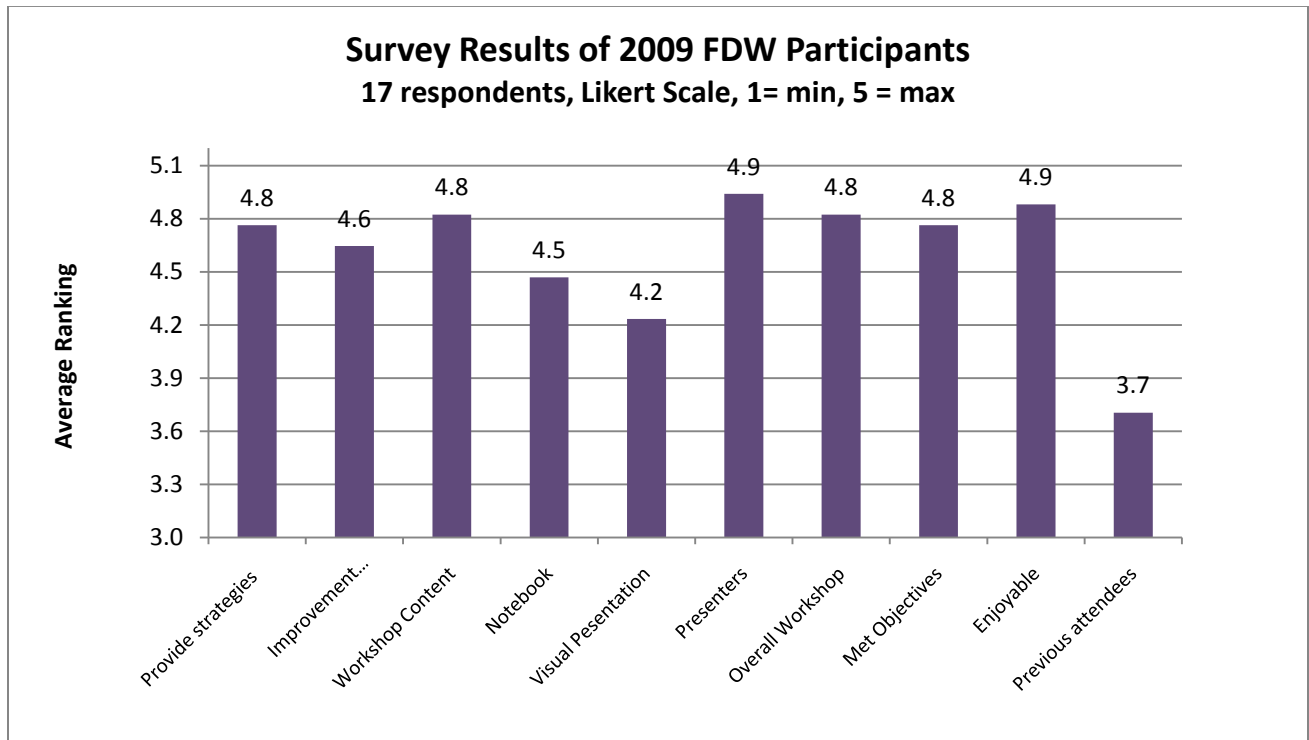


Chart 2. Results of FDW Survey

Encounter Engineering Bridge (E²) Camp

The *Encounter Engineering Bridge Camp* (E²) expanded from the 45 participants in 2007 to 110 freshmen in 2009. Additionally the E² peer mentors increased from 5 in 2007 to 26 peer mentors and 4 engineering ambassadors for the 2009 camp. In conjunction with teamwork and leadership development activities, the 2009 academic program included engineering design, physics and math preparation classes, based on the students entry placement. Other activities included an Industry Luncheon, Ropes Adventures Training, “Discipline Chats” and a Student Organization Night. After each bridge camp, survey and focus group data are evaluated and necessary changes are incorporated into the following year’s camp. These changes are addressed in the “Academic Program and Personal & Professional Development” sections of this document. Details of the activities and assessment of the camp are provided below.

Participants for the E² bridge camp are recruited during the LSU Spring Invitational, campus orientations and recruiting events for high school students, direct mailings, university recruiting events and at other activities hosted by partners of the College of Engineering. In order to participate in the summer bridge camp, students were required to have indicated their major was engineering or construction management and achieved placement into College Algebra or higher.

The main goal of the bridge program is to provide events and activities that allow students to connect with one another and with College of Engineering (COE) faculty, staff and student organizations. Other objectives are: to generate interest in and educate incoming students in the LSU COE disciplines; to provide opportunities for hands-on engineering activities in order to develop problem solving skills and thought patterns characteristic of all engineering disciplines; to introduce students to the academic rigors required by an engineering program; to provide activities that develop personal habits that will enable them to be successful in the university and professional environments; and to provide opportunities to meet others on campus who provide academic, personal and community support.

The E² program consists of academic, community development and personal development sessions. The goals of the academic courses were to provide content knowledge and an opportunity for the students to perform in a team based environment. The academic sessions provided in E² are physics, math and engineering design. The physics concepts presented were selected from the first six weeks of the introductory physics course and have continued throughout the three years of the camp.

In 2007, the E² camp did not offer a math session. In 2008, based on feedback from students, calculus was incorporated into the camp. For 2009, E² offered a range of math sessions: Algebra, Trigonometry, Calculus I or Calculus II. The university math placement data were used to properly group students. All students took a computer based pre test on the first day of camp; students then had follow-up sessions in the lab at their particular level. This allowed the students to adjust to computer based math tests and problems in the university environment.

The engineering design course covered the basic steps in engineering design and project management. In the initial class, the students were assembled into teams of 4 or 5 based on math placement and major. Interests were predominately based on the major selected with no more than 2 students of 4 having the same major. Peer mentors were assigned to lead each team matching their discipline major or similar interests wherever possible.

The design project challenged the teams to design and build a Rube Goldberg apparatus, using at least 4 independent steps, to launch a hacky-sac ball and hit a target. Other requirements included that the steps should use a basic engineering or physics concept, the team should budget and purchase additional pieces, and that the building process of the model be documented either using AutoCAD or photographically for posters. The competition was held the last night of the camp.

Personal and professional development courses included the LSU Sports Complex's Ropes Adventures Training, Stephen Covey's *7 Habits of Highly Effective Teens*®, a Communication across the Curriculum (Cx) seminar, and the LSU Center for Academic Success "A"cing Engineering. Additionally, industry professionals and student organization leaders were recruited to participate in activities specifically geared to introduce the incoming freshmen to the university and professional community. These activities included the Industry Lunch, Student Organization Night and the "Speed Info Session." The highlight this year was the Industry Luncheon with the guest speaker Paul Mainieri, Head Coach of LSU's National Champion baseball team. Coach Mainieri encouraged students to use their gifts of intelligence to advance science and technology and to give back to their communities.

Assessment of the E² camp includes participant perceptions and feedback from peer mentors. In order to continually improve the camp, an attitudes survey of perceived interest and values is given to each student at the conclusion of the workshop. The students rate the activities and events based on a Likert scale, with 1 being least perceived value or interest to 5 being highly valuable or interesting. For three years, the Ropes Activity, the Design Project and Industry lunch are the three activities with the highest value and of most interest. The icebreaker activity, the "flowchart Fetch" and the 7 Habits were rated with the least interest. Overall results of the 2009 survey are depicted in Chart 3.

Flowchart fetch, a scavenger hunt type activity, was developed by the peer mentors to help the students learn where all of the departments and the CoE Deans office are located on campus. Due to the overly competitive nature of a few teams (unexpected), the activity was significantly disrupted and this may have led to the decreased rating. The icebreaker has been used to get the participants in teams and to introduce the teams to their peer mentor. A new icebreaker will need to be developed as this activity is really time consuming for the large groups at the camp. Although 7 Habits is ranked average (ranging from 2.8-3.3) the activity ratings were examined more closely. From the data, it appears that the students either really like it or really dislike it. The number of students giving a rating of "5" and "1" are almost equally acknowledged, with 27 students rating "5" and 26 students rating "1." In previous years the ratings clustered around 3. As with the previous years, approximately 70% of the 2009 E² students would consider being a peer mentor and 92% would recommend the camp to others.

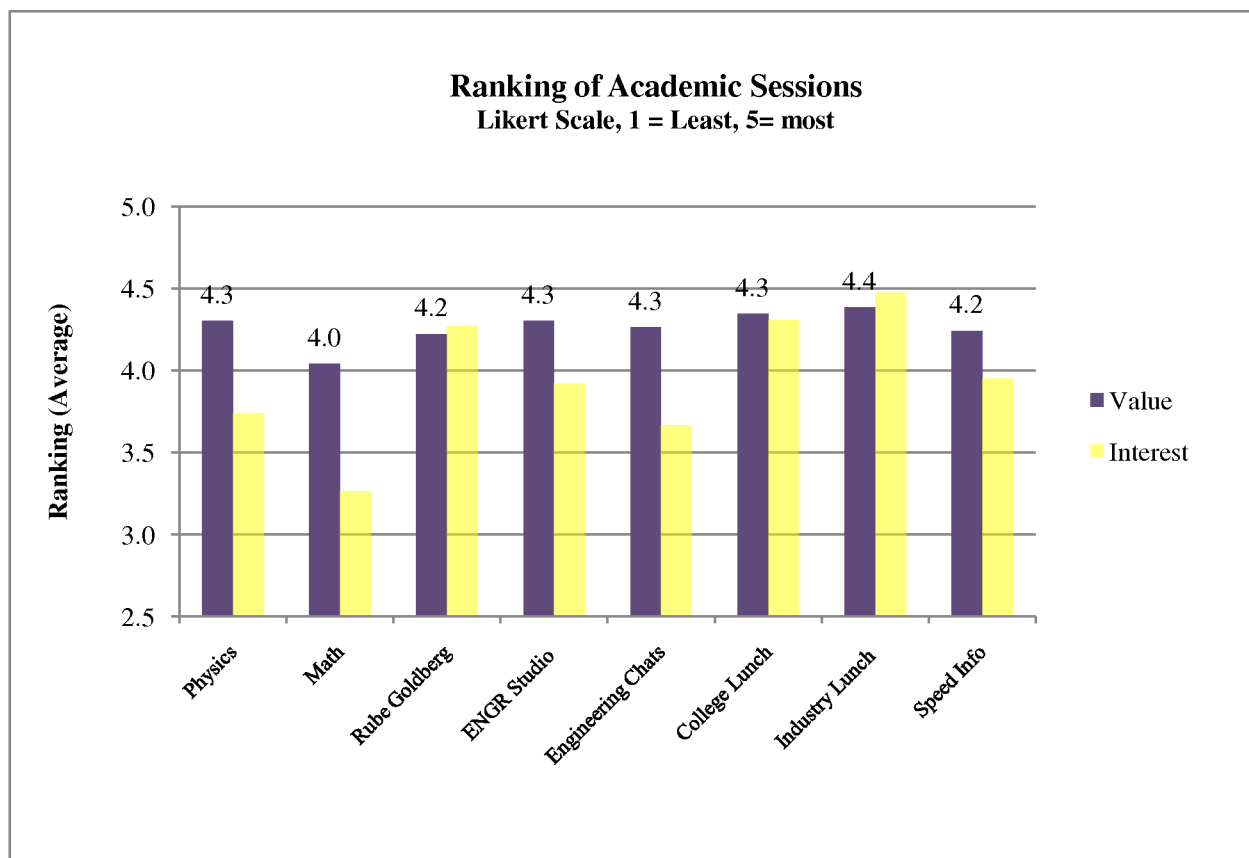


Chart 3. Sample of Rankings of Activities for E²

ENGR 1050, Introduction to Engineering Course

Incoming freshmen unable to join the E² Camp received similar benefits through the interdisciplinary freshman course, *Introduction to Engineering* (ENGR 1050). The course provided interview and career development sessions, discipline chats, scheduling management, an engineering design project, and effective learning strategies training. New for 2009 was the addition of peer mentors as project design captains and student representatives to the competition judging. Winners of the course competition will have the opportunity in the spring to build a prototype and test their design in the 2010 ASEE design national competition.

ENGR 1050 is geared specifically to assist students academically as well as professionally. The class meets twice a week for 1.5 hours and has many elements in common with the E² camp but distributed across an entire semester. Students are encouraged to participate in either the bridge camp or 1050 but not both. The course is open to any university student wanting to enroll with no minimum math requirement. As with E², students are primarily recruited at the LSU Spring Invitational, during advising hours with college counselors, and through the College's S-STEM program.

The first half of the course focuses on academic preparedness, personal and career development and team building. The second half of the course concentrates on the engineering design process. Sessions included career roundtable presentations by faculty advisors, career development and resume writing presented by Career Services and industry based engineers, and interning and student organizations presented by student leaders. Topics include in depth information on the types of engineering, career opportunities, degree programs, assistance in the career decision processes, the basics of the engineering design process, and reinforcement of the importance of communication, teamwork and continued professional development within the engineering profession. Students are required to maintain a design and professional development notebook, attend a career fair and work on a team based design project.

In the Fall 2007 ENGR 1050, the students self selected their design teams and the teams were required to develop an educational module as the design component to the class. In the Fall 2008 class, students were assigned teams and were given the choice of designing an educational module or a hurricane survival kit. For 2009, students were again assigned to teams based on random selection and peer mentors were used for the first time as the team leaders. Unlike Encounter Engineering, peer mentors were randomly assigned to teams. The American Society of Engineering Educators national design competition for freshmen or two year college participants was chosen as the class project. Student teams were offered the opportunity to, through independent study, prototype their baseball robot and subsequently participate in the early summer ASEE competition.

ENGR 1050 is not designed to increase the academic pressure on the students, but to provide opportunities for the students to meet the college advisors, obtain information on various careers, develop project and time management skills, and provide opportunities for networking. The course format has been adapted over the past three years attempting to achieve balance and the bulk of the work is assigned and completed in class, thereby limiting the effort outside of class. The majority of the grades are, as expected, A's and B's. Assessment of ENGR 1050 is primarily grades on the individual design/professional development journals, the team design project and oral presentation, and through focus groups with students.

For 2009, an evaluation of the course activities was developed similar to that used for E². Results of the survey indicate that the majority of students found value and were interested in the discipline chats and the Team tower activities. The majority of the activities were found to be valuable. The lowest in interest was the Career Expo; in written comments several students felt unprepared. Overall, the class met the students' expectations. See Chart 4. As with the E² survey, peer mentors were also rated in this survey; 45 of 58 rated their peer mentors as 4 or above. Nine rated their mentor a 3. In addition to rating the peer mentor, students were asked if they would consider being a peer mentor for 2010 ENGR class; six of the freshmen students indicated that they were interested in being a peer mentor.

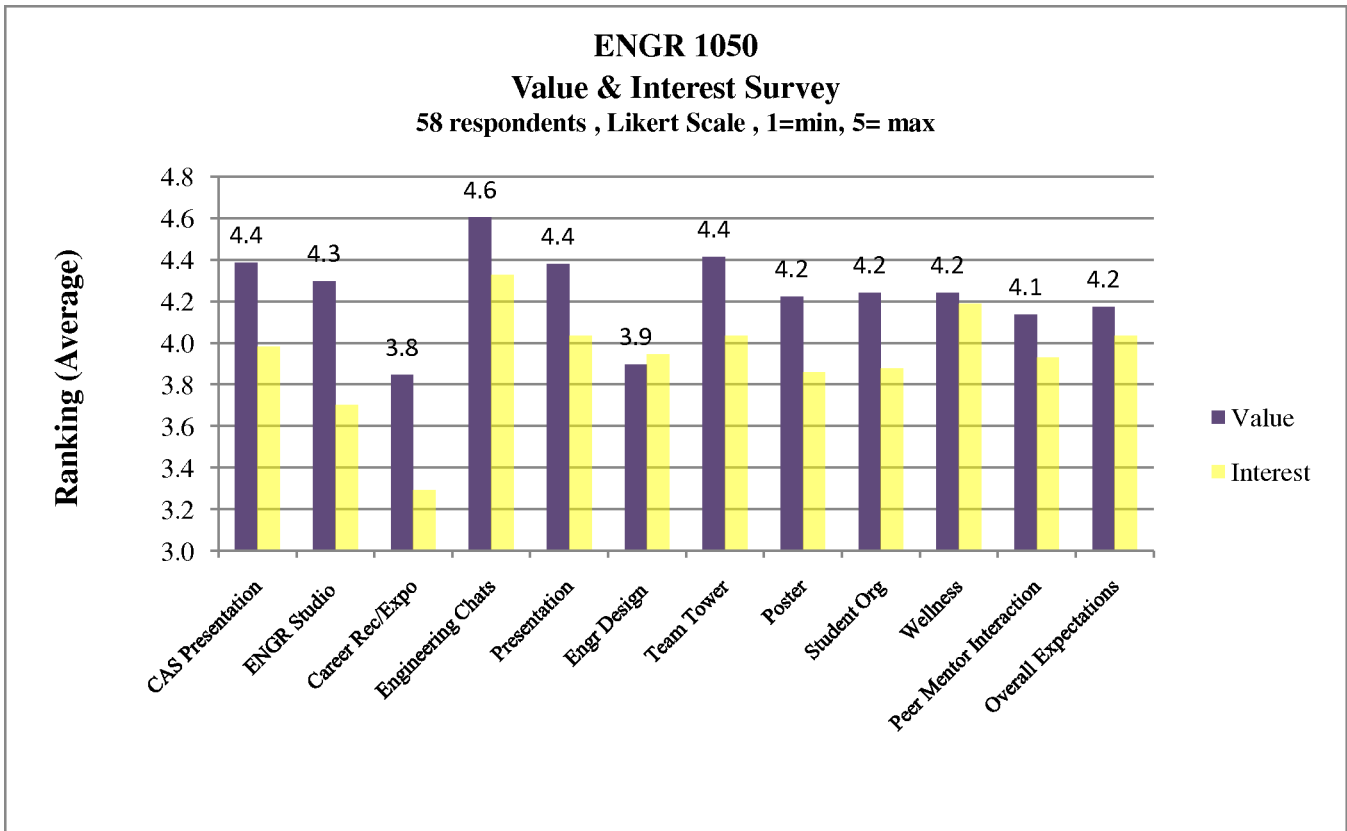


Chart 4. Results of ENGR 1050 Survey, Fall 2009

An outside evaluator was hired to host focus groups to determine if the project was meeting its goals of establishing a community and providing support to the freshmen. Students met with the evaluator in teams for approximately 30 minutes. Project personnel were not present at the focus groups but did provide input into the questions. Representative questions were as follows:

1. How has your participation in ENGR 1050 affected your understanding of what it takes to be successful as an engineering student? (requested 4 answers)
 - a. How have YOU changed, what are you DOING differently or WILL DO differently as a result of participating in the ENGR 1050 course?
 - b. What advantage, if any, do you think participation in the ENGR 1050 course gives you over students who have not participated in it?
2. What kinds of connections have you been able to make within the LSU engineering community? (friends, study groups, student organizations, faculty or upper level student mentors, online networks, etc.)

The results of the ENGR 1050 course evaluation are that the majority of student teams felt that their participation in ENGR 1050 had positively impacted their performance as engineering students and had helped with the following:

- building connections within the College of Engineering,

- increased knowledge of campus resources,
- development of skills needed for success as engineering student,
- better understanding of engineering as a discipline,
- exposure to design process
- awareness of workforce opportunities and expectations.

Students also reported having a much clearer understanding of what it takes to be a successful engineering student and they reported that they were changing their behaviors in positive ways based on what they had learned in ENGR 1050.

Peer Mentoring

The primary duties of the peer mentors include helping freshmen acclimate to university life and leading design teams. The number of mentors grew from five for the 1st camp to 45 for the 3rd camp and Fall 2009 ENGR course. The duties of the peer mentors have evolved from basic interaction to developing activities and leading design teams. Four additional peer mentors were recruited to be ambassadors to the camp; they floated among activities and acted as judges for the design competitions. Twenty of this year's 34 peer mentors were participants in past E² programs.

Peer mentors for the camp are assigned based on majors and common interests. The peer mentors organized some evening activities and were actively engaged in the design project. Approximately ¾ of the campers attended the evening activities developed and hosted by the peer mentors. Evening activities included "Tigerball," soccer, tackle football, ultimate frisbee, video game contests, board game night and bowling.

As noted, peer mentoring was added to the ENGR 1050 course this year. The ratio of peer mentor to freshmen was approximately 1:4, and peer mentors are randomly assigned to teams. Their role in ENGR 1050 is slightly different than for the E² camp as they were assigned the role of project facilitator and as the course progressed, were allowed to become more involved with the design tasks. Peer mentors were encouraged to announce Student Organization events and design team meetings such as the AIChE Chemical car and the ASME Mini Baha Car. One peer mentor presented her experience as an intern at Walt Disney World. Anecdotally, several protégés asked their mentors about instructors or faculty, advice on general education classes, how to dress for interviews and inquired on other activities around campus.

The ENG² program offers training for the peer mentors. Training sessions are hosted in the Spring and again right before the beginning of the E² camp. It includes topics of proper personal interaction boundaries, first aid, services resources available on campus and university rules and guidelines. A round table of past peer mentors answered questions and brainstormed on how to keep protégés involved and what "strange things" had happened in the camp. To wrap up the year, the ENG² program hosted a "Bowling Night" for mentors; approximately 18 students attended. Three of the students were protégés. Due to feedback from the mentors, the ENG² team will host their mentor get together a week earlier next year.

Assessment of the peer mentoring program was performed by the outside evaluator. The assessment included a basic survey of 5 questions designed to be answered in groups. Twenty of the 36 peer mentors attended the evaluation session. Sample questions are as follows:

1. Reflecting on your first year as an engineering major, in what ways have you changed and what are you doing differently?
 - a. How have YOU changed as a result of participating as a Peer Mentor? What do you think you are DOING differently or WILL DO differently as a result of participating as a Peer Mentor?
2. What advantage, if any, do you think serving as a Peer Mentor gives you over students who have not been Peer Mentors?

Peer mentors reported that they had changed in numerous ways as a result of their participation in the program. The majority of the students reported to have made positive changes in academic behavior/study habits, made connections to the LSU engineering community, improved teamwork skills, and developed leadership skills. Peer mentors also reported a variety of advantages of serving as a peer mentor such as resume builder/preparation for workforce, stronger connections to the LSU engineering community, and developed leadership skills.

Finally, the evaluator reported: “Peer Mentors reported that overall the camp experience was a great one for students and asked about the feasibility of expanding the camp so that all engineering students could be included. Some Peer Mentors reported that some students felt they could not attend the camp due to the cost and did not realize that scholarships were available. The Peer Mentors recommended that a more concerted attempt be made to disseminate the information about the scholarships that are available and the camp to all incoming freshmen.”

ENG² Project Retention Impact

In addition to individual program component assessment, the ENG² program assesses the success of its different programs on the retention rates of freshman engineering students. A 2 level, full 6 factorial analyses was done to assess three of the freshmen programs, the E² Bridge program, ENGR 1050 and the Engineering Residential College (ERC). In addition, other factors of gender, race and ACT greater than 26 were included in the analysis. The four responses observed were GPA, Engineering Retention Rate, STEM Retention Rate, and LSU Retention Rate. Two cohorts of students have been compared; Cohort 1 is academic year 2007-2008. Cohort 2 is academic year 2008-2009. The incoming class for 2007/08 AY was 853; of those approximately 20% participated in at least one of the ENG² programs. The freshmen class for 2008/09 AY had 858 students. Of the 858, 268 students or 31%, participated in at least one program.

Students who participated in one of the ENG² programs have a higher retention in the college than those who do not participate, Chart 5, Tables 1 & 2. The ENG² program had a target of 75% retention after the first year of the program and 80% retention after the second year of

programs, Chart 5. The ENG2 project met this expectation for the first Cohort. Although it did not meet the expectation for the second cohort, the difference in retention between the students who participated in one ENG2 program and those who did not was significantly positive. Additionally, students who participate in the ENG² programs also have higher retention the College greater than the historical average. Based on the factor analysis for Cohort 2, the ENG² programs are a significant factor in the retention in the college.

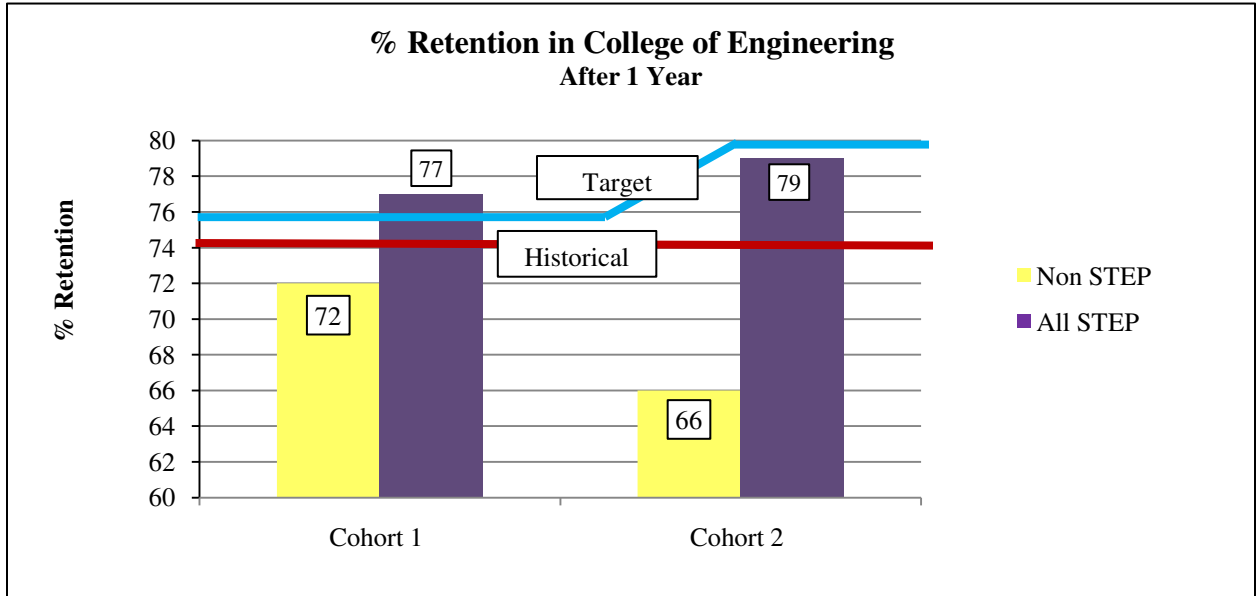


Chart 5. % Retention of Freshmen in the College after one year

Table 1. Retention in College of Engineering after one year

Program	Cohort 1	Cohort 2	Historical
Non ENG ²	72	66	73
ERC	83	77	
ENGR 1050	75	79	
E ² Camp	73	80	
All ENG ²	77	79	

Table 2. Retention in College of Engineering after two years

	Cohort 1	Historical
Non ENG ²	58	55
ERC	77	
ENGR 1050	56	
E ² Camp	65	
All ENG ²	66	

In comparison of the GPAs of all freshmen Engineering students, the ENG² students have the same GPA's as the freshmen class overall, Table 3. Preliminary data reported in the third year review showed the significant factors on the retention in the college is if the student has a math ACT greater than 26. The percentage of students with ACT Math score greater than 26 varies within the program, Table 4. The ERC has the greatest number of students with a score at or above 26, approximately 67% while the E² Camp and ENGR 1050 course have approximately 54%. Based on feedback from students and leaders, changes were made to the program for year 2. Due to the changes in the program for the second year, a comparison using the second cohort is being used to see if the program is significant for students with lower ACT scores. The E² camp and the course appear to be positive in retention for students with lower ACT scores, however at this time it is not significant, Appendix II, Table 1. More in depth analysis will be performed Cohort 2 after the completion of their second year.

Table 3. Comparison of Overall LSU GPAs, after one year

	Cohort 1	Cohort 2
Overall	3.0	2.9
ERC	3.1	3.1
ENGR 1050	2.8	2.9
E ² Camp	2.9	3.0

Table 4. Percentage % of Students, Cohort 2, with Math ACT \geq 26

Overall	E ² Camp	No E ² Camp	ERC	No ERC	ENGR 1050	No ENGR 1050
64.3%	54.2%	57.3%	66.5%	53.8%	54.8%	57.2%

The program also positively affects the retention of the students in the university, Appendix II, Tables 1&2. Reviewing the longitudinal trend for Cohort 1, data indicates that the program has a positive effect in retention for not only the college but STEM degrees and LSU.

Conclusions and Next Steps

Based on the results of the surveys, the outside evaluator and the retention data the LSU State University ENG² project is meeting its overall goal of building a community between the incoming freshmen classes and the College. Based on the 2 years of data for Cohort 1 (07/08 AY) and 1 year of data from Cohort 2 (08/09 AY), preparation for calculus appears to be the positive significant factor in retention in the College of Engineering and the university. The ENG² project is having a positive effect on the retention of these students in the College and the University in comparison to their peers. The E² Camp and the ENGR 1050 course are providing support and increasing retention of students with the lower ACT scores.

The next steps of analysis are based on feedback from the third year review. The team is obtaining and analyzing the math and physics grades for all students who participated in a course with a faculty member who attended the Faculty Development Workshop and the E² camp. Their grades will be compared to a control group of students who did not participate in the camp or have a faculty member who has participated in the FDW.

Acknowledgments

The ENG² team would like to acknowledge to work of its outside program evaluator, Dr Linda Ramsey Educational Consultant, La Tech University, for her assistance in reviewing this project and input into the development of the program evaluation tools.

This material is based upon work supported by the National Science Foundation under Grant No. 0622524. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.

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APPENDIX I. Table 1. Number and Demographics of Program Participants

Program	Program Year	# of Students or Faculty	Demographics
Faculty Development Workshop	Year 1	18	15 ENGR/ 3 other
	Year 2	17	13 ENGR/ 4 other
	Year 3	20	15 ENGR/ 5 other
E ² Camp	Year 1	45	80/20% male: female 22% minority
	Year 2	84	82/18% male: female 6% minority
	Year 3	106	85/15% male: female 8% minority
ENGR 1050	Year 1	56	69/31% male: female 33% minority
	Year 2	74	74/26% male: female 28% minority
	Year 3	70	67/33% male: female 15% minority
E ² Mentoring	Year 1	5 Peer Mentors	80/20% male: female
	Year 2	15 Peer Mentors	60/40% male: female 21% Minority
	Year 3	31 Peer Mentors	71/29% male: female
		4 Ambassadors	15% Minority
1050 Mentoring	Year 3	14 Peer Mentors	60/40% male: female 20% Minority

APPENDIX II.

Table 1. Comparison of Retention, Cohort 2, after First Year

Program	College	STEM	LSU
E ² Camp	80	78	88
No E ² Camp	77	79	88
ERC	77	79	88
No ERC	78	80	88
ENGR 1050	79	77	89
No ENGR	78	80	88

Table 2. % Retention, Cohort 1

College of Engineering

	Year 1	Year 1.5	Year 2
Overall	74	67	61
ERC	83	72	77
ENGR 1050	75	65	56
E ² Camp	73	70	65
All ENG ²	77	69	66

STEM

	Year 1	Year 1.5	Year 2
Overall	78	71	65
ERC	87	76	80
ENGR 1050	77	67	60
E ² Camp	76	73	68
All ENG ²	80	72	69

LSU

	Year 1	Year 1.5	Year 2
Overall	88	84	81
ERC	92	84	87
ENGR 1050	96	83	77
E ² Camp	95	85	85
All ENG ²	94	84	83