Criteria for Promoting Living-Learning Center Student Success

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Abstract

In 2002, the academic and student life divisions of Baylor University launched a partnership aimed at advancing the residential contribution to the learning experience of engineering and computer science undergraduate students. The need to consider proactive intervention arose in response to student feedback relating to the problematic learning culture presented within some existing residence halls as compared to the high academic expectations demanded of engineering and computer science students by faculty members. Simultaneously, Baylor was in the early stages of implementing a ten-year vision, Baylor 2012, which includes two imperatives calling for the "establishment of a residential campus" where "learning can flourish." Faculty, staff, and students studied and recommended a plan to create within Baylor's first new residential facility in forty years a component that "fosters a balance between serious intellectual pursuits and social interaction both in the classroom and living room." This facility was constructed adjacent to the engineering and computer science building. Applicants to the Engineering and Computer Science Living-Learning Center (ECS LLC) are scored on a variety of factors including academic credentials, co-curricular activities, ratings by teachers, and written responses to provocative scenarios. Over fifty of the eighty-seven first-year residents were freshmen, substantiating the longstanding culture for most Baylor sophomores to move off campus. Applicants for the second year included nearly as many continuing students, which was attributed to the presence of the completed facility and the favorable perception the ECS LLC gained among the student population.   After the completion of the Center's first year, an analysis was conducted to evaluate and weight students' application-qualification factors compared to the academic and opportunistic success of each resident. The results of this evaluation were used to adjust the application admission criteria for the current year, and subsequent evaluations will be used to modify the acceptance criteria annually.

Introduction

Baylor University is an institution largely associated with Texas and known for its distinctive Christian mission. Baylor, Texas' oldest university, was chartered by the Republic of Texas in 1845. Baylor's history is replete with numerous successes and controversies, some of the more notorious being related to athletics and its Christian heritage, but also many noble achievements correlating to its academic pursuits.

Among the more recent and significant changes at Baylor, two stand out as beacons for a progressive 21st Century direction. In 1990, then President Herbert Reynolds mastered a charter change that resulted in a self-perpetuating institutional governing board. Then, in the mid nineties, Baylor and three other Southwest Conference universities merged with the old Big 8 Conference to form the more institutionally and geographically diverse Big XII Conference. These changes helped to alter Baylor's perception of its place in national and international higher education.

During the academic year 2001-02, then President Robert Sloan, led administration, faculty, staff, students, alumni, and other constituents of Baylor thru a visioning process aimed at progressing the University forward. The stated purpose of this exercise was to "move Baylor University into the upper echelons of higher education." The result was a roadmap document and ten-year plan commonly referred to as *Baylor 2012*.[1] This plan included the twelve imperatives listed in the Table I.

Table 1: The Imperatives of vision *Baylor 2012*
I. Establish an environment where learning can flourish.
II. Create a truly residential campus.
III. Develop a world-class faculty.
IV. Attract and support a top-tier student body.
V. Initiate outstanding new academic programs in selected areas.
VI. Guide all Baylor students through academic and student life programming to understand life as a stewardship and work as a vocation.
VII. Provide outstanding academic facilities.
VIII. Construct useful and aesthetically pleasing places.
IX. Enhance involvement of the entire Baylor family.
X. Build with integrity a winning athletic tradition in all sports.
XI. Emphasize global education.
XII. Achieve a $2 billion dollar endowment.

The pursuit of virtually all of these imperatives had the potential to create a positive impact on Baylor's School of Engineering and Computer Science (ECS), and that unit has already benefited significantly from *Baylor 2012*. But it was imperatives I, II, IV, VI, VIII, and especially imperative II: Create a truly residential campus, and imperative I: Establish an environment where learning can flourish, that presented a special opportunity.

Background

As is the case at many other universities, common feedback from on-campus Baylor ECS students often included concerns about the conduciveness of the learning environment in some residence halls for students pursuing rigorous academic majors.[2] Responding to this feedback prompted the School to begin exploring avenues to create alternative on-campus living

opportunities for ECS students.[3] Preliminary conversations were held with the Office of Campus Living and Learning (CLL) to better understand their receptiveness. As Baylor had not constructed a new on-campus residence hall in nearly forty years, the possibility of building a new learning community, with bricks and mortar and from the ground up, was not originally foreseen as a possibility. But with the newly embarked *Baylor 2012*, and ECS's and CLL's eagerness to leap forward in dramatic fashion, soon exploring the feasibility of a new on-campus residence facility to accommodate the Engineering and Computer Science Living-Learning Center (ECS-LLC) was initiated.

In 2003-04, the ECS-LLC was constructed as a part of Baylor's North Village Residential Community. This complex consists of living accommodations for 600 students within three "houses," and also includes a café/social space and an academic center that includes a classroom, faculty offices, student organization space, project rooms, and offices for student life personnel. The living accommodations are apartment-style suites, each with a living room and 60% with kitchens. A Chili's Too and Starbucks are located in the adjacent facility on the west side and the Rogers Engineering and Computer Science Building is located on the east side. The architecture of the North Village encourages student and faculty interactions and is replete with spiritual symbolism.

Though it was largely recognized within the ECS School that a residential facility aimed at the needs of ECS students could be a great benefit,[4,5] there was little internal expertise among the faculty as to implementing the organizational and operational detail of such a unit. Several of the more student and freshman oriented faculty members, willing staff members, students, and Baylor student life personnel all pitched in to provide construction input and establish initial guidelines. The practices and expectations of related endeavors at other intuitions were examined with the intent of using best practices and developing an enterprise that fit the ideals and needs of Baylor. A new staff member with a graduate degree in Student Services was brought into the team during the

Figure 1: ECS-LLC Heritage House within North Village

middle of the spring semester before the LLC opened in Fall 2004. Though during the first year the male and female ECS-LLC students were split among two of the "houses," they were consolidated into gender-specific wings of a larger "house" the second year.

Examples of periodically scheduled ECS-LLC activities include:
- Weekly afternoon gatherings when Dr Pepper floats are served
- The availability of a tutor four evenings a week
- Monthly movie nights where the movie itself exposes an important life lesson
- Bi-weekly meetings of the student leadership council
- Monthly lunches of faculty and students

Examples of more impromptu ECS-LLC sponsored activities include:
- Playing campus golf (using a tennis ball) with select faculty
- A Sunday dinner cookout at the dean's home after church
- Hosting highly ranked prospective students for an overnight visit
- A luncheon lecture by the Purdue mechanical engineering department chair

There are numerous instances too of by-chance activities occurring at the initiative of individual students and groups. Examples include ballgame watch gatherings, Bible studies, outings to the mall, and study sessions.

Figure 2: ECS-LLC students watch the Lady Bears win the National Championship

To further help build community, freshman ECS-LLC students were registered into special cohort laboratory sections of either the first freshman engineering course or the first freshman computer science course. During the first year, Dr. Walter Bradley, Distinguished Professor of Mechanical Engineering, and his wife, lived on site in one of the apartment suites. During the third year, Prof. Cindy Fry, Senior Lecturer of Computer Science, her husband and two children, will move into one of the apartment suites.

Project Analysis

Admission to Baylor's ECS-LLC is not available to all ECS students and is by written application only. Because the desired environment requires a high level of participation, accepted applicants must demonstrate they have abundant intellectual talent, self motivation, and desire to help/interact with others. Though there was some sense of what the ideal ECS-LLC student would look like, the implementation team was not certain just how to articulate and measure such attributes. Though there were published accounts of characteristics of developing learning communities,[6, 7] no other single program combined all the elements sought in Baylor's ECS LLC.[8]

The freshman application for the Baylor ECS-LLC consists of three elements beyond the information contained in and required for the regular Baylor undergraduate student application. The first section includes a student-provided listing of leadership examples and a listing of achievements, honors and awards. The second includes student-written responses to two of the three essay scenarios listed in TABLE II. The third is a reference form completed by the student's teacher of choice. Within this form, the teacher rates the applicant on the eight different characteristics shown in TABLE III, with possible ratings being, Don't Know; Below Average; Average; Well; Very Well.

TABLE II: ECS-LLC Application Essay Scenarios	
1.	What do you hope to gain from participating in the ECS-LLC?
2.	How will your interests or abilities (academic or extra-curricular) contribute to the ECS-LLC?
3.	What person or event most influenced your decision to study an Engineering or Computer Science discipline?

TABLE III: ECS-LLC Application Teacher Rating Characteristics			
1.	Problem solving ability	5.	Self-motivation
2.	Leadership ability	6.	Enthusiasm
3.	Willingness to interact with others	7.	Open-mindedness
4.	Responsibility	8.	Desire to learn

The admission criteria for continuing (upper class) ECS students is similar, though their Baylor academic record is used to judge their academic potential and the recommendation must be completed by an ECS faculty member. As the custom for students to move off campus after their freshman year was so imbedded, few continuing students initially choose to participate. During the second year, additional continuing students chose to participate and the vast majority of freshman who participated the first year returned to the ECS-LLC for their sophomore year. TABLE IV shows the breakdown of ECS-LLC participants by year, gender, and major.

TABLE IV: ECS-LLC Enrollment Statistics		
	2004-05	**2005-06**
Enrolled	87	141
Males	69	115
Females	18	26
Freshman	51	74
Returning	34	66
Transfer	2	1
Engineering	54	92
Computer Science	33	49

Each ECS-LLC application receives a score on the scale of $1 \rightarrow 100$. For the first year, an applicant who received a score of seventy or greater was accepted. For the second year, the application process was similar and the admission value was raised to seventy five. The value increased to eighty the third year, and still some applicants had to be placed on a wait list as all the available spaces were filled.

By in large, students who participated in the ECS-LLC during the first year performed well academically and participated in LLC-sponsored activities and events. As the annual cycle of applications began well before the completion of the ECS-LLC's first year, the relative

weightings of the application-scoring process could not be evaluated in time for it to be improved for the second year. Therefore, the performance of freshman students who entered the Baylor ECS-LLC during Fall 2004 was analyzed and the results used to adjust the weighting factors for the applicants for Fall 2006.

Two factors were considered in evaluating the success of freshmen ECS-LLC students. Academic success was measured using the student's GPA. The second factor involved a measure of the student's participation in ECS-LLC activities and events. During the year a record was kept of students' attendance at around fifty associated ECS-LLC events. Those involving faculty interaction or a higher commitment were weighted higher. The ratio between academic achievement and ECS-LLC participation was *a-priori* assigned to be 60:40.

A statistical analysis was conducted to determine which combination of weighted factors created the highest practical (nearest 5%) correlation coefficient. In essence, this was an attempt to assign the most appropriate weights to the application factors that yielded the best prediction for student success. The most important factors were determined to be the SAT/ACT score, high school class rank, graded response to essay scenario, and teacher rating. The highest correlation coefficient of r=0.605 occurred when the following weightings were applied.

- SAT/ACT score = 35%
- High school class rank = 35%
- Essay scenario score = 15%
- Teacher reference score = 15%

Adjusting any of these factors either higher or lower results in a lower correlation factor. When compared to the original application scoring rubric, these weightings yield an increase in the student success correlation coefficient of 0.15.

There were two other factors considered of benefit but that weren't quantified. One was the date the student submitted the application. Another was initiative shown by the student to secure recommendation forms from two or more teachers. Because such factors were believed to be positive but not at the level that could be defended by statistical significance, these factors are award "extra credit" of up to two points each.

Observations and Conclusions

The effect of the ECS-LLC on student performance has not yet been fully qualified. There is preliminary evidence that some of the ECS-LLC cohort sections performed statistically better in that course than their counterparts. It is also believed that the ECS-LLC has had a positive impact on prospective student recruitment. The entering ECS freshman class as a whole for Fall 2005 was 28% larger than it was the preceding year and the average SAT (or converted ACT) score was 28 points higher.

There is antidotal evidence that students enjoy participating in the ECS-LLC and believe that experience benefits them academically and otherwise. Evidence for this conclusion is based on

re-enrollment data contained in TABLE IV, students' willingness to participate in prospective-student recruitment activities, comparative academic achievement at Baylor, the results of a preliminary study referenced below, and student testimonials such as those shown in TABLE V.

TABLE V: Testimonials of Baylor ECS-LLC Students	
Student Characteristics	**Student Testimonial**
Freshman female Computer Science major	I have met fellow students, professors, and other staff members who have and will continue to embrace, encourage, and challenge me.
Freshman male Mechanical Engineering major	I know some engineers who are not living in the North Village and I know for a fact they are having a harder time finding people who are interested in what they are interested in.
Sophomore male Computer Science major	I was given an enriching opportunity which I seized and, I think, will be more successful in my academic career because of it.
Junior male Electrical and Computer Engineering major	I met dozens of engineering students that I would not have met otherwise.
Freshman male Computer Science major	If I had a problem in calculus, physics, or my computer science class, all I would need to do is ask my neighbor.
Freshman female Computer Science major	I could not imagine having to go through freshman year starting out in a Computer Science degree while not living with other Computer Science majors.

The student life component of the implementation team, Dr. Frank Shushok, Dean for Student Learning and Engagement, and Ms. Terri Garret, Director for Housing Administration and Academic Initiatives, recently completed a research study of the ECS-LLC during its first year of implementation While the results of this study will be published in detail elsewhere, the preliminary results shown in TABLE VI indicate that the level of faculty interaction among ECS-LLC students was substantially higher when compared to groups of statistically similar ECS students. Their study involved the development, validation, and administration of a survey instrument. The two student populations were controlled on several variables including classification, gender, race, academic index, and major.

TABLE VI: Results from Faculty Engagement Survey[9]	Odds favorable response is higher for ECS LLC student
Survey Statement	
Discussed career plan and vocational aspiration with a faculty mentor	3.2
Met informally or socially with a faculty member outside of class or faculty office	15.8
Discussed academic issues with a faculty member outside of class or office	5.8
Discussed spiritual issues with a faculty member outside of the classroom environment	5.7
Discussed a social issue or world event with a faculty member outside of class or faculty office	2.7

As the ECS-LLC has matured and become more accepted and effective, the quality and performance of the student population has also improved. Future improvements should also include the employment of improved weighting factors that better predict which students will take advantage of and thrive in the ECS-LLC. A similar analysis will be conducted periodically and application weightings factors adjusted accordingly in future years.

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