





By Brad Johnson

Measuring the Impact of Facilities on UCCS Student Retention

Today, higher education institutions face competitive challenges that are similar to competitive challenges found in any other market sector. Both private and public higher education institutions are competing with one another to recruit and retain the same students. Student retention and graduation rates are currently among the most discussed topics in the field, and they are critical measures of the quality of higher education institutions. This article summarizes my much larger capstone project conducted as part of my work toward earning a Master's of Public Administration (MPA) at the University of Colorado Colorado Springs (UCCS), where I also work as a facilities services planning, design and construction project manager.

APPA's Center for Facilities Research (CFaR) was established in 2002 to organize and consolidate research in educational facilities management. CFaR is interested in exploring whether the physical campus can help universities achieve their student retention objectives. In 2006, CFaR undertook a study to determine the importance of campus facilities relative to other institutional characteristics and explored various influences exerted by university facilities. This study, entitled *The Impact of Facilities on Recruitment and Retention of Students*, examined the relationship between physical assets and certain outcomes.

This report sought to answer questions such as:

- What factors influence a student's choice to attend a particular higher education institution?
- When and how do students obtain their information about an institution?
- How do institutions' physical facility assets (buildings, grounds, landscape, and other tangible resources) help to recruit students?
- What is the impact or benefit of facilities in the recruitment process?
- What factors influence a student to stay at their original institution of choice?
- What, if any, impact or benefit do facilities have on retaining students?
- Are there demographic differences in the impact of facilities on recruitment and retention?
- Can the physical environment's impact on student outcomes be measured according to a defensible set of hard data?

Other studies have examined the relationships between student performance and classroom size, seating arrangement, acoustics, external noise, indoor air quality, lighting, and temperature.

RESEARCH PROBLEM AND QUESTIONS

APPA wants to update the findings of the 2006 CFaR study and plans to create a longitudinal study using a large sample population of students attending various colleges and universities in the United States and Canada. Now-retired UCCS staff member, APPA Fellow, and past APPA President Gary Reynolds, primary author of the original study, was a mentor through my capstone and research project. I volunteered to help with the new APPA study by developing new survey questions for APPA's consideration and use. I presented these new questions, along with select questions from the 2006 study, to a portion of the UCCS student body.

*For the UCCS population, my **primary research question** will be to determine the following: Is an undergraduate student's decision to stay enrolled at UCCS associated with the existence, design, and condition of UCCS facilities? The **null hypothesis** is that there is no association between student retention and UCCS facilities.*

Currently, there is very little research performed on which environmental and architectural design components of a campus affect a student's decision to stay enrolled. In this research project, I examined whether there was a relationship between these factors, and also focused on the possibility of general causation between UCCS facilities' physical assets and student retention.

To determine which survey questions about classroom and campus characteristics should be asked of the UCCS student

sample, I researched several areas, including the maintenance and condition of buildings and grounds, overall campus building design, ADA (Americans with Disabilities Act) accessibility, classroom lighting, classroom temperature, and exterior campus grounds. Below is a summary of each of these key areas:

Maintenance and Condition of Buildings and Grounds

First, we know that the physical features of a campus can either hinder or promote learning. The physical environment, that is the university or college campus, has many roles in the educational enterprise, and includes buildings, grounds, transportation, parking, utilities, open space, recreation, and more. The condition of these environmental factors could certainly influence whether students choose to stay or leave a campus. First impressions are vital selling points for prospective students, and the campus that fails to address them could make a grave mistake. Students seek an environment where they can study, learn, collaborate, and be successful.

Overall Campus Building Design

"Students . . . focus on whether they feel comfortable in the places where they will spend most of their college time, including the library, the student center, laboratories, and other specific buildings" (Orban, 2014). Well-designed campus buildings play a significant role in student recruitment, but creating comfortable spaces for students is not enough. Designing classroom spaces that support learning and collaborating with other students could impact academic performance.

ADA Accessibility

The *Digest of Education Statistics* has reported that of the more than 19 million students in American colleges and universities, 8.7 percent of them, or 1,669,000 undergraduate and graduate students, had disabilities. Many students with disabilities become actively engaged in campus life in a variety of ways, thus helping with the transition between high school and college and incorporation into the life of the college (Tinto, 1993).

Classroom Lighting

Today, there are many ways that a campus can provide lighting in a classroom. Across the UCCS campus, some buildings have abundant natural light, while others have traditional lighting and no windows. Newer buildings are outfitted with LED lighting, daylighting strategies, lighting control systems, and natural lighting.

After the energy crisis of the early 1970s, some schools were designed with no windows to save energy. Research conducted to determine the impact of windowless schools found no discernible impact on test scores. However, research did determine that teachers and students were very dissatisfied, but did not deem the dissatisfaction critical (Baker & Bernstein, 2012). There are buildings on the UCCS campus constructed in the 1970s and 1980s with either few or no windows.

Classroom Temperature

Achieving thermal comfort in a classroom can be complex and challenging. Classroom temperature on the UCCS campus is programmed and controlled through a building automation system. A classroom's temperature can be affected by room size, its location within the building, its temperature design parameters, and the number of occupants using the space. In addition to temperature, human thermal comfort is also affected by humidity, air velocity, radiant surfaces, and clothing and activity levels. It is difficult to work in a classroom or office that is too hot or too cold.

Exterior Grounds of Campus

UCCS is committed to sustaining its campus landscape and open space by developing and implementing practices and educational opportunities aimed at enhancing the aesthetics, function, and natural context of the landscape. Alexander's 1977 study *A Pattern Language: Towns, Buildings, Construction* identifies outdoor walkways, hallways, public gathering areas, and outdoor spaces as contributing to a sense of community.

SURVEY DESIGN

I focused on a quantitative study to produce reliable data for UCCS. I examined the relationship between independent, dependent, and control variables. Due to the limited time our students have available on campus, I created a survey with 18 questions in order to minimize the time needed to complete it. The survey was administered through SurveyMonkey.

SURVEY DATA ANALYSIS

Frequencies:

- *Students Re-enrolling for Fall 2018 Semester*
In asking whether a student intends to re-enroll at UCCS for the Fall 2018 semester, 71 percent responded "Yes." 25 percent responded, "No, because I am graduating." 1 student (1 percent) responded, "No, and I am not graduating." 3 students (3 percent) were undecided. According to the Integrated Postsecondary Education Data System, UCCS has a 67 percent undergraduate student retention rate (IPEDS, 2019). (Figure 1.)

- *Importance of Facilities in Student Decision to Continue Enrollment*

In answering whether they made their decision to continue or end enrollment due to UCCS facilities, 42 percent of respondents stated that facilities was one of their top five reasons to continue enrollment, 55 percent stated that facilities did not affect their decision, and 3 percent stated that facilities was one of their top five reasons to end enrollment. (Figure 2.)

- *Overall Maintenance and Condition of Campus Buildings*
Of UCCS respondents, 22 percent stated that the overall maintenance, cleanliness, and condition of UCCS campus build-

Figure 1: Student Retention

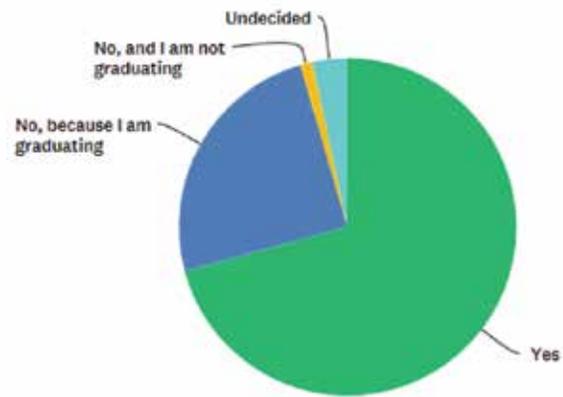


Figure 2: Importance of Facilities for Continuing Enrollment

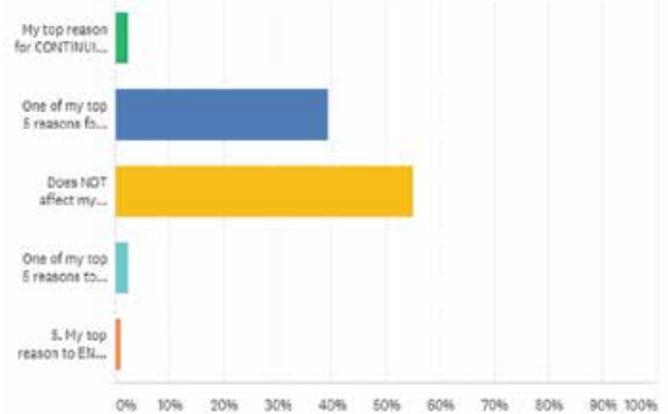


Figure 3: Overall Maintenance and Condition of Buildings

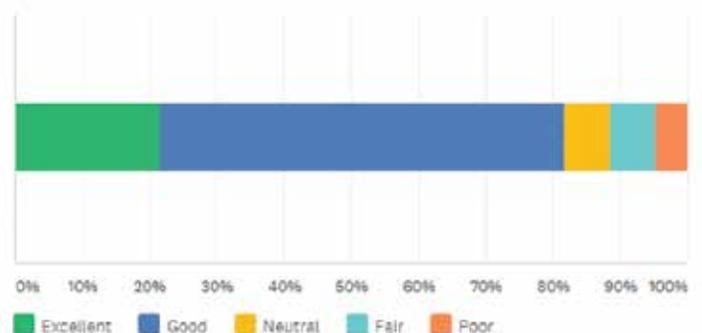


Figure 4: Overall Campus Design

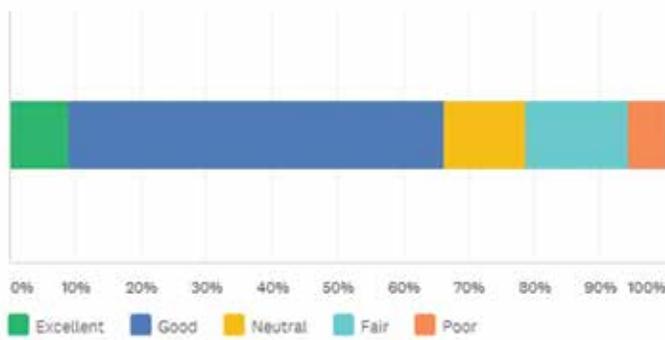


Figure 5: - Overall Appearance of Grounds

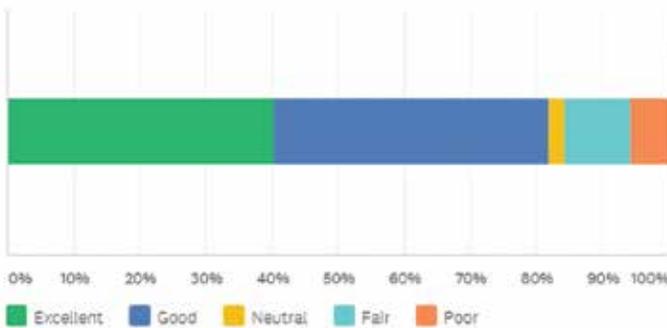
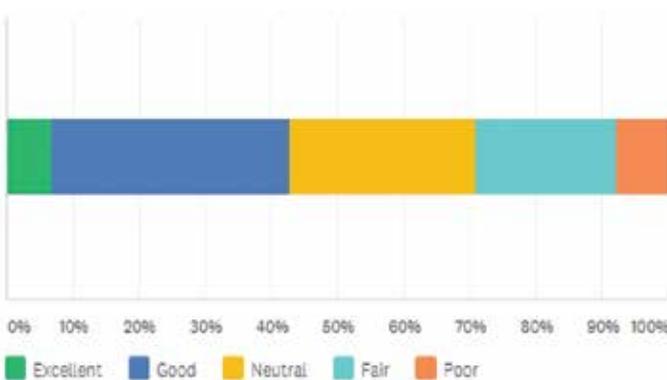


Figure 6: - Overall Campus ADA



ings were excellent, 60 percent stated that they were good, 7 percent were neutral, 7 percent stated that they were fair, and 4 percent stated that they were poor. (Figure 3)

• *Campus Design*

Of UCCS respondents, 9 percent stated that the overall campus design of UCCS was excellent, 57 percent stated that it was good, 12 percent were neutral, 16 percent stated that it was fair, and 6 percent stated that it was poor. (Figure 4)

• *Overall Appearance of Grounds*

Of UCCS respondents, 40 percent stated that the overall appearance of exterior grounds at UCCS was excellent, 42 percent stated that it was good, 2 percent were neutral, 10 percent stated that it was fair, and 6 percent stated that it was poor. (Figure 5)

• *Overall Campus ADA*

Of UCCS respondents, 7 percent stated that the overall campus ADA accessibility was excellent, 36 percent stated it was good, 28 percent were neutral, 21 percent stated that it was fair, and 8 percent stated that it was poor. (Figure 6)

• *Classroom Lighting*

Of UCCS respondents, 9 percent stated that UCCS classroom lighting highly affects positively their ability to learn, 25 percent stated it somewhat affects positively, 39 percent stated that it has a neutral affect, 22 percent stated that it somewhat affects negatively, and 4 percent stated that it highly affects negatively their ability to learn. (Figure 7)

• *Classroom Temperature*

12 percent of UCCS respondents stated that UCCS classroom air temperature highly affect positively their ability to learn, 17 percent stated that it somewhat affects positively, 52 percent stated that it has a neutral affect, 16 percent stated that it somewhat negatively affects, and 3 percent that it highly affects negatively their ability to learn. (Figure 8)

CONCLUSION AND RECOMMENDATIONS

Many factors can influence student re-enrollment decisions. Among such factors are campus facilities impacts on student loyalty, certainty of choice, satisfaction, experiences, learning, and tests and grades. This study does suggest that campus facilities positively factor into many students' perception of campus and their ability to learn in a classroom. However, the strength of relationship between these building, site, and classroom characteristics with student retention was considered weak and not statistically significant.

Because of the limitations of this study, I am cautious about claiming causality between facilities and UCCS student retention. While a future APPA study will be an enormous undertak-

ing, this study will be a step toward helping shape the questions asked of the larger desired population.

The limitations of this study include the survey request being delivered only to those students who have joined the UCCS Connect network, and the small number of students responding. Not all students join UCCS Connect, and there may be a demographic bias toward more successful, more involved students. Getting students to quickly and voluntarily respond without incentives has been difficult. In addition, the students who take the time and effort to respond may also be biased toward the more successful and involved people, compared to the general student population at UCCS.

Another limitation of this study relates to the multitude and variation of campus facilities, a factor that also causes me to be cautious about generalization. In a short survey, it is impossible to determine which specific campus facilities actually impact a student, the frequency of the impact, and the nature of the impact amidst the many different facilities existing on campus.

This study is also limited because of the inclusion of students above the freshman level. Most students who end enrollment do so at the end of their first year. The reasoning of the prior dropouts from previous freshman classes is unknown. However, such inclusion does suggest that many students who chose to continue enrollment consider facilities as part of their decision.

I will be meeting with APPA to further evaluate the findings and how the survey questions could be enhanced for the larger study.

In addition, I would make the following recommendations:

1. Identify a “Campus Ambassador” to assist with facilitation of the survey on each campus.
2. Expand on the list of campus buildings that students take classes in, aside from solely those related to their major. This could help each campus facilities management team to further evaluate how the results affect their own campus.

Figure 7: Classroom Lighting

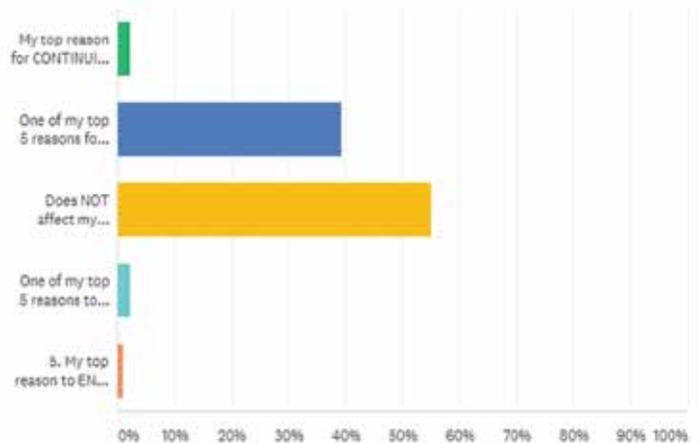
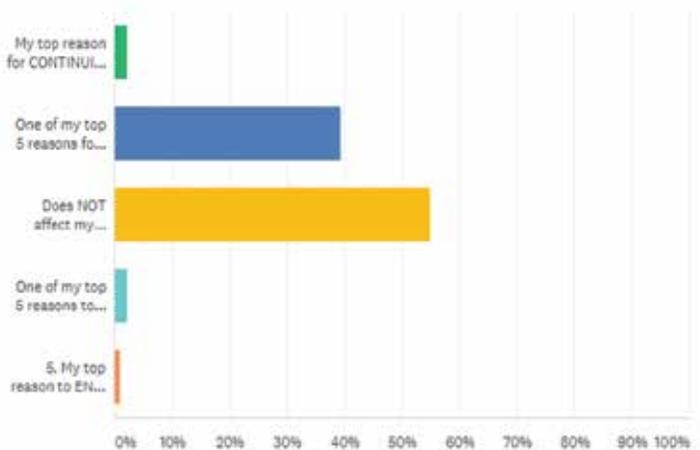


Figure 8: - Classroom Temperature



3. Rewrite a question focused on which external factors may influence student retention, including facilities, in a rank/order response.
4. Package the survey as a facilities "satisfaction" survey and send it out through the main campus student listserv.
5. To improve survey questions, provide pictures of campus attributes in lieu of written sentences, which would help convey the intent of the question to a student.
6. Provide an opportunity for qualitative feedback on the survey form. ☹

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