2019
Assessment of Collegiate Residential Environments & Outcomes
Annual Report

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Welcome

The Assessment of Collegiate Residential Environments & Outcomes

In late summer, at colleges across the United States, residential campuses experience a flurry of activity as students fill their halls. For an increasing number of our students, their housing could be a place where the learning continues and is integrated with their living experience. Upon returning from a busy day, these students may practice their foreign language major on a culturally-themed floor, discuss their academic and professional goals with a residence-based peer advising group, plan a philanthropic event with their service-oriented community, or even use medieval recipes to prepare dinner with the history professor who lives down the hall. These integrative experiences, and the living environments in which they occur, are a lot of work – even when they are excellent examples of collaborations between myriad campus departments both in and out of student affairs. But the Assessment of Collegiate Residential Environments & Outcomes is agnostic about the administrative systems that create these living environments. Our focus, instead, is firmly on the students: ACREO is invested in increasing our understanding of the residential environment's impact on student development and academic success.

We already understand a lot about living learning programs as a high-impact practice, thanks in no small part to Karen Kurotsuchi Inkelas and Aaron Brower, who launched the National Study of Living Learning Programs (NSLLP) over a decade ago. However, as institutional priorities continue to shift regarding residential requirements and program development, it was important for this study to expand its scope to be inclusive of all living environments. We don't believe that all residential environments should look the same; nor do we believe that certain programs or initiatives such as LLPs are a cure-all. Instead, we believe, as we know you do, that the powerful practice of living on campus can have a profound influence on our students. We're hopeful that this report helps you understand how your good and hard work is positively influencing your students, and how you might alter that good and hard work to improve the impact of the residential experience on particular outcomes.
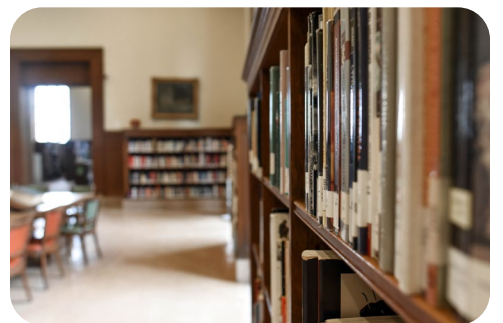

Sincerely,

Dr. Matthew Mayhew, ACREO Principal Investigator
William Ray and Marie Adamson Flesher Professor of Educational Administration
The Ohio State University

Table of Contents

Executive Summary

This study explores how various residential environments and experiences influence student academic, intellectual, and social outcomes. By using multiple linear regression analysis, we found the most important residential experiences for student success include perception of major-related support, discussing sociocultural issues with peers, residential environment's influence on major, co-curricular programming engagement, and perception of peer network.
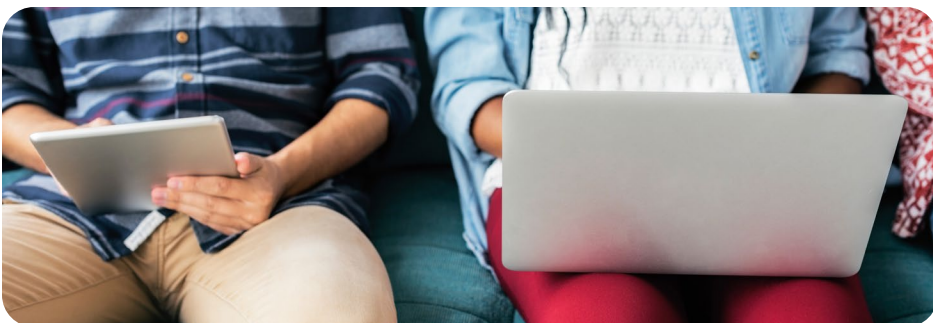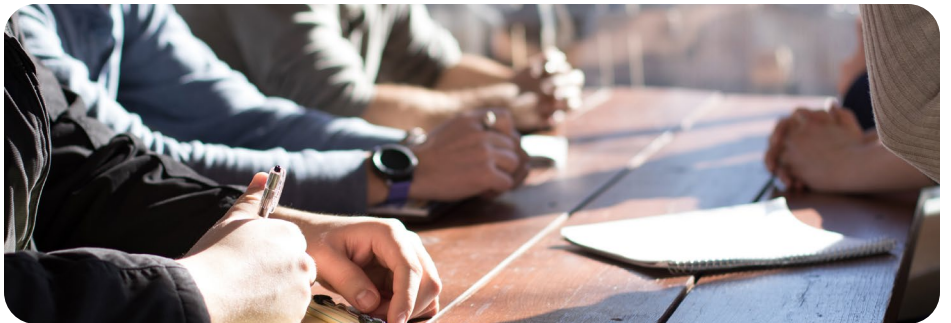
Introduction
Report Overview

About ACREO

Overview of Study

Research has traditionally demonstrated that living on campus was one of the most significant contributors to a host of college outcomes. The most recent volume of *How College Affects Students* (Mayhew et al., 2016) highlighted many ways that living on campus has changed over the last three decades. Changes to student engagement on campus, especially in residence, reflect new and lasting ways that students connect with one another and campus resources. Students may not be as dependent upon their residential environments for social or academic connections as they once were. Expanding social networks influence how students choose to engage with their living environment and subsequently calls into question many traditional methods of programming within residence halls. As campus leaders design new residence halls and develop residential priorities, they must seek to understand how changes in student experiences impact student outcomes. While living on campus still "contributes to greater retention and graduation" (Mayhew et al., 2016, p. 545), individual campus environments play their own role in impacting student's innovation, persistence, and sense of belonging.

The Assessment of Collegiate Residential Environments and Outcomes (ACREO), led by Dr. Matthew J. Mayhew, furthers the conversation by assessing the influence of the varied residential environments on the academic, intellectual, and social development of college students. Drawing from the knowledge of seasoned residential life and housing professionals as well as scholars of student learning and development, its primary purpose is to help institutions understand how their residential programs shape students' learning and development while providing multi-institutional data.

The study has been, and will continue to be, administered to a diverse and representative sample of colleges and universities, which allows for national benchmarking. Our 2015 pilot year had nearly 1,500 responses from students at seven institutions, public and private, urban and rural, from New York to California. We added four institutions for the 2016 study, six institutions in 2017, and three in 2018; five institutions joined in 2019, bringing the total number of students represented to over 133,000. The research collected on this data will inform the conversation about effective residential practices in higher education for years to come.

⊘ States where ACREO has been administered
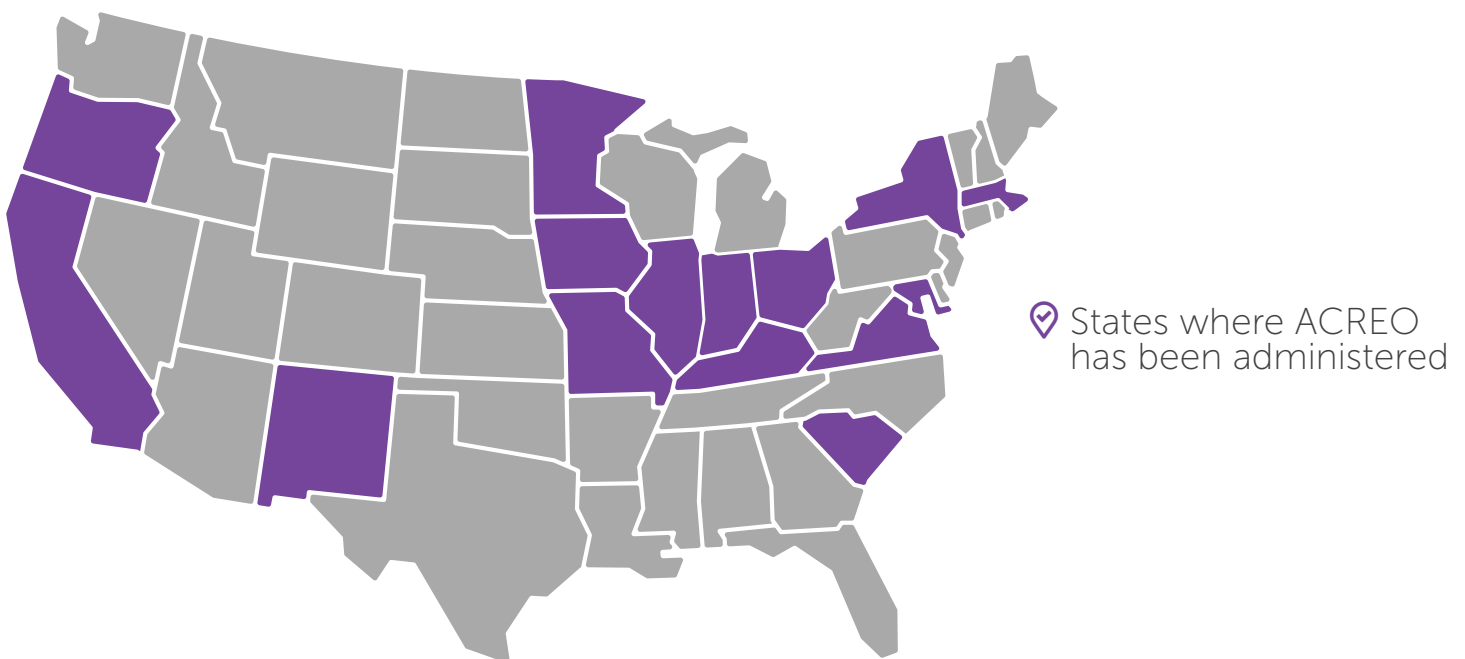
Research and Assessment Questions

ACREO is designed firstly as an assessment tool - our goal is to help practitioners identify meaningful data around their students' experience by measuring what students gain through distinct facets of their residential programs. However, this project also continues and improves upon previous research by providing current insight into how student outcomes vary by college residential arrangements. Three primary questions guide our thinking for this project:

1. **How do student experiences differ by residential environment?** Answers to this question can help practitioners understand if students in various residential programs have different experiences in the ways they expect based on programmatic designs and intentions.
2. **How do student outcomes differ by residential environment?** Answers to this question can help practitioners know that their programs are achieving their intended learning outcomes and objectives.
3. **Which experiences influence which outcomes?** Answers to this questions can help practitioners understand which practices to implement if they want their students to achieve intended outcomes.

Theoretical Framework

Using Astin's (1984) Input-Environment-Outcome college impact model, shown in Figure 1 above, we've developed a framework to conceptualize the influence of residential experiences on student outcomes. As Inkelas et al. (2008) described, in Astin's model, outcomes (student characteristics after exposure to college) are influenced by both inputs (demographic and precollege characteristics, beliefs, and expectations) and environments (the various programs, policies, relationships with faculty and peers, and other educational experiences in which students are engaged).

We consider several different inputs and the influence of integrated residential environments - including academic experiences, campus climate, and non-academic/social experiences - on the development of specific academic and social outcomes. See Figure 2 for the specific inputs, environmental aspects, and outcomes measured in ACREO.
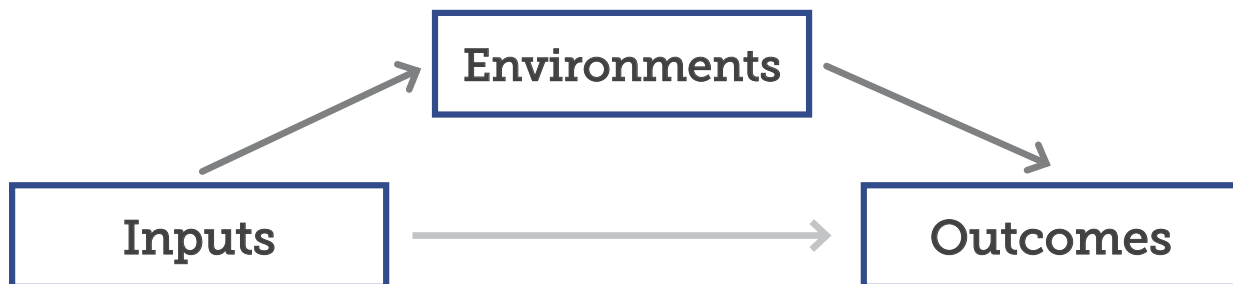

Figure 1: Astin's I-E-O model (1984)

Measures of Experiences and Outcomes

This study seeks to understand the influence of residential environments on the academic, intellectual, career, and social development of college students. ACREO measures the following residential experiences and student outcomes, briefly summarized below:

Residential Experiences

- **Perception of Major-Related Support System:** Students report on the extent to which they have access to peer role models and professional mentors who are supporting them in their major as well as the extent to which they feel supported in their major by parents and friends.

- **Discussed Learning Experiences with Peers:** Students report the frequency of discussions about something learned in class with other students outside of class.

- **Discussed Sociocultural Issues with Peers:** Students report the frequency of discussions about diversity and major social issues as well as discussions with students who have different values and/or hold different religious worldviews.

- **Residential Environment's Influence on Major:** Students report on the extent to which interactions with peers, faculty, and staff in their residential environment encourages or discourages them in their pursuit of their major.

- **Campus Climate by Demographic:** Students of color, LGBQ students, students holding historically underrepresented religious worldviews, international students, and students who identify as a gender other than cisgender man report on the campus climate for their population, including perceived faculty attitudes, perceived interactions between students from particular populations and the "majority" group students, general campus commitment to support their student populations, etc.

- **Faculty Interaction:** Students report the frequency of discussions with faculty about personal problems, career ambitions, and other non-course-related topics as well as assignments or extra assistance regarding course content. Students who indicated there were faculty affiliated with their residential environment were asked about interaction with both the residential faculty and faculty generally.

- **Residence Hall Resource Engagement:** Students report the frequency with which they utilized access to computer labs, academic advisors, peer counselors, professional staff, and faculty in their residential environment. Only students in residence halls were asked this question.

- **Co-curricular Engagement:** On-campus students report the frequency of participation in events associated with their residential environment, including multicultural programming, cultural outings, and career workshops. All students were asked about their co-curricular programming engagement during their general college experience.

- **Peer Network:** Students were asked to describe the relationships they have with other students in their residential environments, including if they have friends with whom they can study, have intellectual discussions, and who are from diverse backgrounds.

- **Supportive Residential Environment:** Students report their perceptions of how other students in the residential environment support each other both socially and academically as well as general satisfaction with the environment.
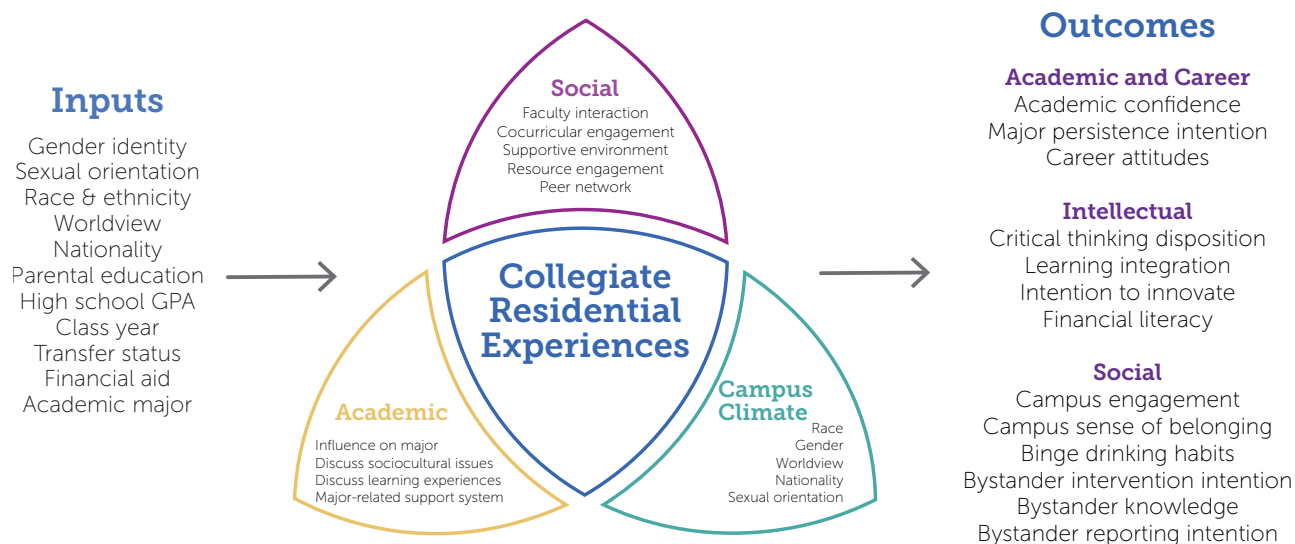
Inputs

Gender identity
Sexual orientation
Race & ethnicity
Worldview
Nationality
Parental education
High school GPA
Class year
Transfer status
Financial aid
Academic major

Social
Faculty interaction
Cocurricular engagement
Supportive environment
Resource engagement
Peer network

Collegiate Residential Experiences

Academic
Influence on major
Discuss sociocultural issues
Discuss learning experiences
Major-related support system

Campus Climate
Race
Gender
Worldview
Nationality
Sexual orientation

Outcomes

Academic and Career
Academic confidence
Major persistence intention
Career attitudes

Intellectual
Critical thinking disposition
Learning integration
Intention to innovate
Financial literacy

Social
Campus engagement
Campus sense of belonging
Binge drinking habits
Bystander intervention intention
Bystander knowledge
Bystander reporting intention

Figure 2: ACREO Conceptual Framework

Student Outcomes

- **Academic Confidence:** Students report their confidence in their ability to persist in their major, excel in their major, complete their major with a B average, persist to graduation despite various obstacles, reach academic goals (e.g. overall B average; graduation with honors), and stay at their current institution.

- **Major Persistence Intention:** Students report their plans to persist in their major and commitment to graduating from their major.

- **Career Attitudes:** Students report their confidence in their ability to get a job as well as their perception of how graduating will influence landing a job, getting a good salary, doing meaningful or satisfying or exciting work, and doing work that utilizes skills from their major.

- **Self-Reported Critical Thinking Disposition:** Students report their attitudes toward critical thinking habits of mind, such as questioning a professor, disagreeing with texts, arguing with people, exploring new ideas, and critically analyzing different points of view.

- **Integrative Learning:** Students report the extent to which they integrate what they're learning by applying it to the real world, reflecting on how they're learning it, putting it in context, connecting it with a personal experience, and extrapolating abstract ideas from concrete observations. This outcome is was introduced in 2018 and updated this year.

- **Intention to Innovate:** Students indicate how effective they think they are in identifying new opportunities, developing a strategy to direct their and others' efforts in the direction of realizing new opportunities, acquiring resources necessary to realize a new opportunity, and creating a new entity to take advantage of new opportunities.

- **Financial Literacy:** Students answer three questions on interest rates, inflation, and stocks and mutual funds. These questions have correct responses and the factor was calculated by adding the number of correct responses. This outcome was also introduced in 2018.

- **Campus Engagement:** Students report the extent to which they are involved with some kind of community, including volunteering for the community and working to make the community better; students also report on self-efficacy in terms of their impact on community.

- **Campus Sense of Belonging:** Students report the extent to which they feel comfortable in, are a part of, are committed to, are supported in, and are accepted on campus.
- **Binge Drinking Habits:** Students report how many times they had five or more drinks in a typical 2-week period. This is the only outcome in which a lower response is more desirable.
- **Bystander Intervention Intentions:** Students respond to different scenarios by describing in which instances they would intervene and in what ways they would intervene. If the student respondents would not intervene, they are asked to explain why.
  - » **At a Party:** A male and female student are leaving a party together and the female student is drunk. Instances include being friends with the male student, being friends with the female student, and not knowing either person well.
  - » **In Residence:** A student couple are audibly fighting in an adjoining apartment and the respondent doesn't know either person well.
  - » **Racial Incident:** A peer in a residence hall writes a racial slur directed at another member of the community on their white board. This outcome is new for this year.
- **Bystander Intervention Knowledge:** Students are asked to indicate their familiarity with sexual assault and bullying prevention strategies and resources.
- **Bystander Intention to Report:** Students indicate how likely they are to report sexual misconduct or bullying if they or a peer are the victim.

Although most of the current measures were asked using a battery of three questions or more and analyzed using factor analysis, there were a few measures which are only one- or two-item constructs; these measures do not have enough items to use factor analysis. All measures were initially tested using the pilot data from 2015 and retested again using the most current data. We've determined that all of our scales are reliable, with Cronbach's alphas for most of the factors in the range of 0.85 to 0.95. Only one of the factors - self-reported critical thinking disposition - has a Cronbach's alpha below 0.80.

In addition to the measures above, ACREO also reports on several additional experiences and outcomes, including self-reported current GPA, peer connections (how and in what contexts they have connected with new people on campus), and institutional retention intention (whether students plan to return to the same college/university next year). Lastly, we ask students several questions about the level of faculty and staff involvement in their residential environment, why they chose their particular residential environment, and the reasons they would, or would not, attend an event organized by faculty and staff associated with a residence hall.

Instrument and Data Collection

Survey Development

The ACREO survey was adapted from the 2007 National Study of Living Learning Programs (NSLLP) and was designed to focus more on assessment and less on research. The length of survey was reduced in 2016 after robust analysis from the 2015 pilot study to make it more manageable for students to complete. However, we update the survey every year so that it continues to measure current topics of interest.

Students who take the survey are asked to self-report their demographics first, before being asked about their current residential environment and experiences. Although several of the questions ask students to consider their particular residential environment when answering, all students see the same battery of questions on the surveys regardless of their reported residential environment, except for residential resource engagement.

We understand that living environments, specifically residence halls or LLPs/Residential Colleges/Honors Colleges, look different depending on the institution. Additionally, we understand that students are not always aware of their placement in a residential environment, or sometimes think they live in a certain community when they actually do not. Therefore, we ask students to self-describe their residential environment to best capture what the perception of their environment looks like.

Likert-Type Scales Used

ACREO measures student residential experiences and outcomes using Likert-type scales, described below. Scale ranges are indicated next to measure title in all tables.

Scales ranging from 1-5 are used when students are asked to rate:

- Confidence (1=Not at all confident; 5=Confident)
- How much they agree or disagree (1=Strongly disagree; 5=Strongly agree)
- Level of encouragement (1=Greatly discouraged; 5=Greatly encouraged)
- How likely they would be to perform an action (1=Very unlikely; 5=Very likely)
- How effective they are in performing a task (1=Extremely ineffective; 5=Extremely effective)

We use a 0-4 scale when measuring how often students participate in activities such as discussing learning with peers and engaging with resources or co-curricular programs (0=Never, 4=Always (Daily)), if they are available. For housing decisions, we use a 1-4 scale (1=Didn't even consider; 4=Very important). Lastly, the financial literacy questions are coded as incorrect (0) or correct (1).

Timeline

The results for your students presented in this report are compared with students who participated in the 2017, 2018, and 2019 administrations. Over 46,500 students at seven institutions were invited to take the ACREO survey between March and June of 2017. The 2018 study invited over 12,890 students at three institutions to participate. This year, over 36,600 students at one of five institutions were asked to respond to the ACREO survey. Students had an average of 3 to 4 weeks to complete the survey in all administrations.

Participating Institutions

In 2017, ACREO was administered at seven U.S. public and private colleges and universities. Six are considered Doctoral Universities: Highest Research Activity and one is classified as a Doctoral University: Higher Research Activity. The average number of living learning programs at each institution was about 15. Additionally, several operated designated residential and honors colleges.

During the spring of 2018, three U.S. public doctoral universities participated in ACREO. Two of these universities participated in 2017, whereas the third was new to ACREO this year.
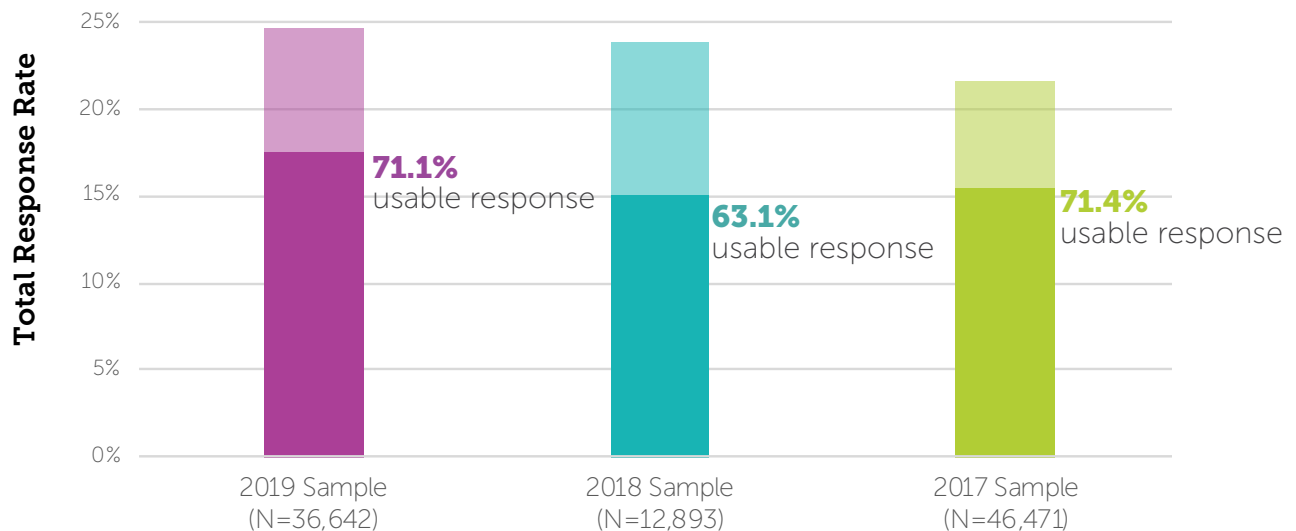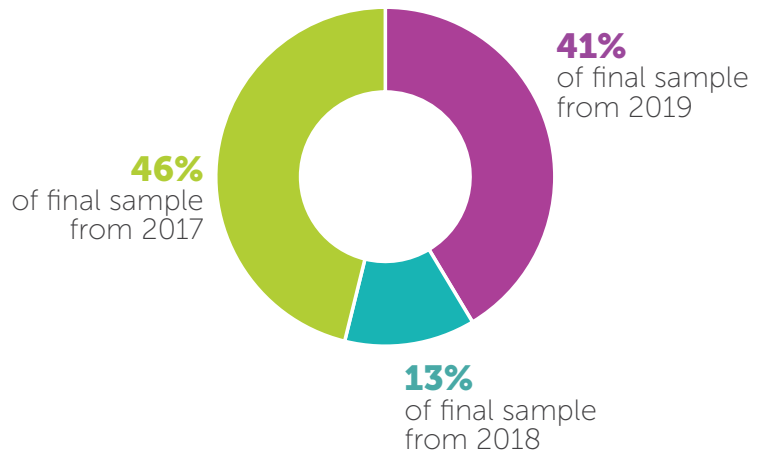
This year, five U.S. public doctoral universities participated in the study. Three of these institutions participated in the past (one in 2015 and two in 2017). The two new institutions are located in the Great Lakes and Southeast regions; the 2015 repeat institution is also located in the Southeast. One of the 2017 repeat institutions is also located in the Great Lakes region, with the other 2017 repeat institution located in the Far West.

Because the survey changed from 2015 to 2016, we do not include results from 2015's pilot study in this analysis. Additionally, due to the ever-changing demographics of college and university students, we also did not include the results from the 2016 study in this analysis. Please refer to those reports for information on past survey administrations.

Response Rates

In the past three years, over 96,000 students were invited to take the ACREO survey. A total of 22,164 students responded (response rate of 23.1%), while usable data for students who completed at least 80% of the survey was obtained for 15,543 respondents (usable data rate of 70.1%). After removing duplicate responses at repeating institutions, the final analytic sample came to 15,256. See Figure 3 for more information on the response rates and sampling information.

Figure 3: ACREO Response Rates

41% of final sample from 2019

46% of final sample from 2017

13% of final sample from 2018

71.1% usable response

63.1% usable response

71.4% usable response

Total Response Rate

2019 Sample (N=36,642)
2018 Sample (N=12,893)
2017 Sample (N=46,471)

Using This Report

A Word of Caution

The findings presented in this report should be considered as part of a larger whole. No single percentage or mean can capture the essence of a college or university, not to mention the dedicated work of its staff. Rather than place tremendous weight on any particular numerical result, these findings are best viewed as pieces of a larger picture explaining how students broadly experience campus. After considering how these results complement and contradict campus stakeholders' perceptions, findings can serve as the basis for discussion that may lead to a more comprehensive understanding of students' residential environments. In short, the intent of this report is to assist campus leaders in building an empirical basis for future actions.

Report Sections

This report is divided into two chapters: Chapter 1 provides an overview of the sample's demographic characteristics, and Chapter 2 focuses on understanding how the residential experiences described above influence the student outcomes we measured.

Important Terminology

In our attempt to make this report as practitioner-friendly as possible, below are some of the terms we use to talk about the results. Appendix A provides more information on how to read the tables and charts used in the report.

- **Factor Score:** A factor score is a measure comprised of related survey items confirmed by a statistical technique known as factor analysis and is used to represent a concept that cannot be measured with one or two questions. We calculate the factor score by weighting each of the items before summing them and dividing by the smallest value. This process provides a more accurate measure of the factor while also keeping the score within the range of the items' scale. For example, if the items asked a student to respond on a 1 to 5 Likert scale, the factor score will range from 1 to 5.

- **Significance:** Statistical significance indicates whether or not there is a statistical difference between groups. The null hypothesis always assumes there is no statistical difference, though significance values (often referred to as p-values) allow researchers to reject the null hypothesis and suggest a difference does exist ($p < 0.05$). Put simply, a p-value less than 0.05 means there is a 95% chance the difference found between groups is not simply due to chance. Differences found to be statistically significant at the 95% level are labeled within each table.

  It is important to note that while a given difference might be statistically significant, it may not be practically significant. For example, a study comparing grade point averages among male and female students may find that female students have statistically significant GPA differences, with female students averaging a 3.16 and male students averaging a 3.01. Practically, however, each of these GPA values represent a B average on a standard 4.0 grading scale. In these cases, it is useful to consider practical significance by using effect sizes.

- **Effect size:** We use effect sizes to measure the practical difference found between groups, although ultimately each institution must determine whether or not the differences identified (significant or not) are of practical value. Effect sizes differ from the previously-discussed significance levels in that significance testing determines whether or not statistical differences between groups exist, whereas effect sizing attempts to quantify the magnitude of such difference.

Although there are a number of different measures for effect size, we rely on Cohen's d since it's a standardized measure of the distance between two means (Cohen, 1988). Cohen suggested effect size measures greater than 0.8 should be classified as large, values between 0.5 and 0.8 should be classified as medium, values between 0.2 and 0.5 should be classified as small, and values less than 0.2 should be classified as trivial. We make use of these suggested labels in the report yet caution against blanket application of these effect size values, as Cohen does. Readers are encouraged to consider effect size differences in light of specific campus and cultural contexts.

Acknowledgments

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Chapter One
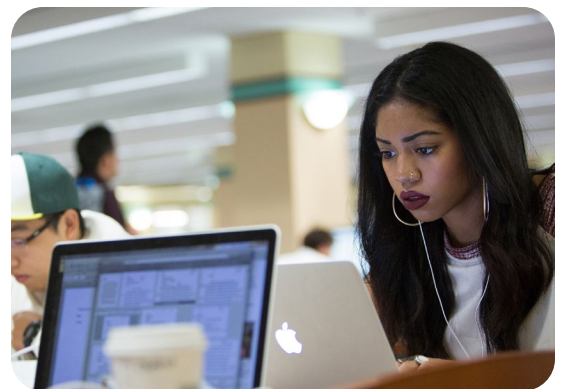## Student Demographics

Equity-Minded Considerations

As college and university populations become more diverse, it's essential to consider their characteristics as we measure their experiences and outcomes. While inferences about students based on demographics are beyond the scope of this study, we wanted to present general information on the student sample's characteristics.

We included this chapter to help lay the groundwork for the following chapters by providing you with an idea of who responded to the survey, but this sample may not be representative of all students on your campus. We suggest you compare the demographics of these students to those on your campus before making generalized conclusions based on this report.

Lastly, our goal with this study is to help institutions produce equity-minded solutions to issues students may experience in residential programs. To that end, we recommend you consider what institutional structures hinder the experiences of traditionally underserved students and how your staff can work toward removing them so all students feel supported in your residential programs.

Social Identities

We consider gender identity, sexual orientation, race, worldview, and nationality as student social identities. Students are able to select more than one option per identity, so any percentages presented here may differ from those in the dataset. Please note, we attempted to demonstrate all possible identities in the graphic below. Options are listed in alphabetical order.

Gender Identity

Cisgender man	33.2%
Cisgender woman	64.4%
Genderqueer or another gender identity	1.4%
Transgender	1.0%

Race/Ethnicity

Asian/Asian American/Pacific Islander	27.9%
Black/African American	4.2%
Hispanic/Latina/o/x	10.3%
Middle Eastern	1.6%
More than one race/ethnicity	9.9%
Native American or another race/ethnicity	2.1%
White	44.1%

Sexual Orientation

Bisexual	8.4%
Gay or lesbian	3.7%
Heterosexual	81.8%
Queer or another sexual orientation	6.1%

Worldview/Religion

Agnosticism or atheism	36.1%
Buddhism or another worldview/religion	10.4%
Christianity	41.8%
Hinduism	2.1%
Islam	1.7%
Judaism	2.5%
More than one worldview/religion	5.4%

Nationality

Domestic	91.8%
International	8.2%

Student Socio-Academic Background

Socio-academic background characteristics include the student's highest level of parental education, self-reported average high school grades, and financial aid.

Most student respondents come from families with parents who have at least a bachelor's degree.

Neither parent with at least a bachelor's degree   26.1%

One parent with at least a bachelor's degree   56.2%

Both parents with at least a bachelor's degree   17.8%

Student respondents earned mostly A's and B's in high school.

10.7%

30.4%

58.6%
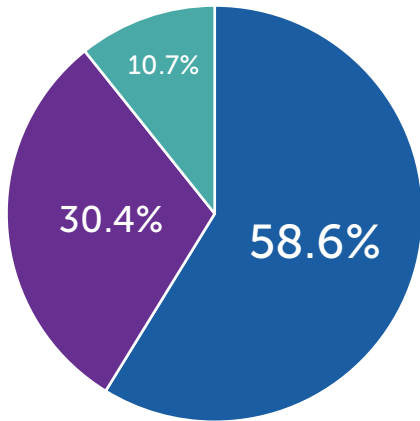
Average high school grades of A+ or A
Average high school grades of A- or B+
Average high school grades of B or lower

The most common form of student financial support comes from the institution.

Did not receive financial aid   27.6%

Federal grants   34.2%

Federal loans   35.0%

Institutional merit scholarships or grants   37.7%

Outside scholarships   24.6%

Private loans   7.1%

Work study   19.4%
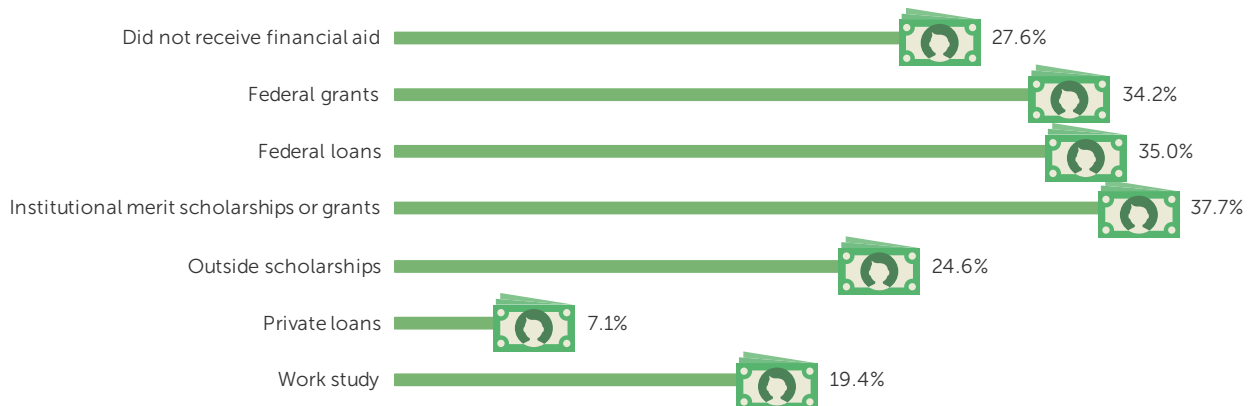
Collegiate Academic Characteristics

Academic class year, major category, and self-reported GPA are reported as collegiate academic characteristics. Additionally, we include the number of students who said they transfered colleges and switched majors.

The most common majors for student respondents are in the STEM fields.

Arts & Humanities
12.6%

Business Admin.
8.3%

Health Professions
9.6%

No Major Selected
7.4%
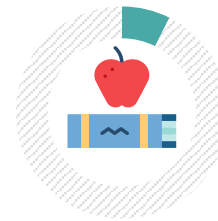
Social Sciences
21.8%

STEM Fields
40.2%
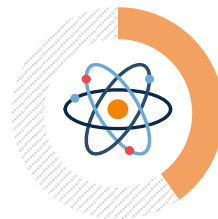
Most student respondents are in their first year.

First year: 50.1%

Second year: 23.8%

Third year: 19.9%

Fourth year: 4.3%
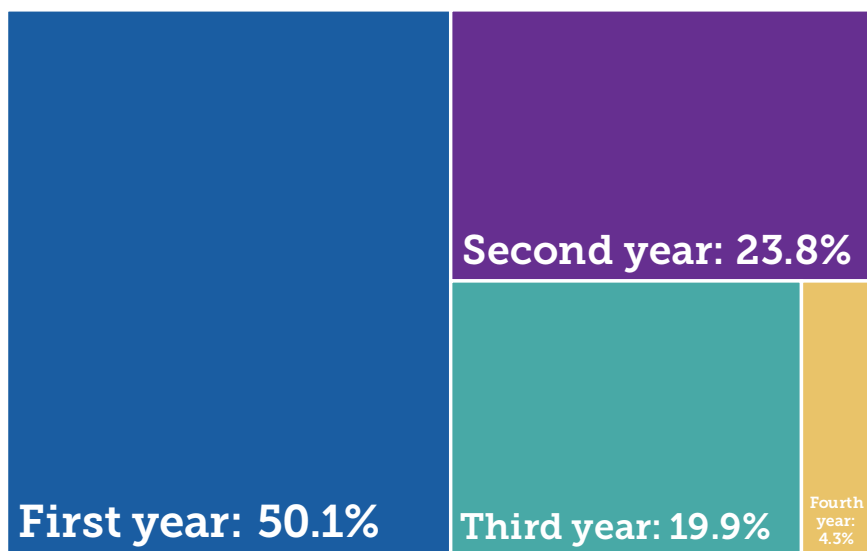
12.5%
of student respondents transfered from another college

21.1%
of student respondents changed their major

3.44
average self-reported collegiate GPA among student respondents

Chapter Two
Impact Analysis
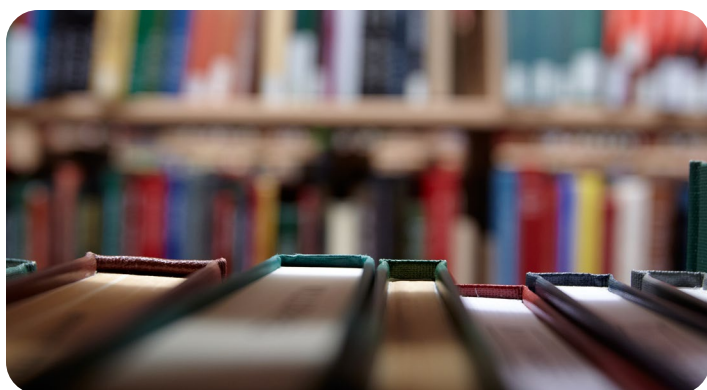
Impact Analysis

Measuring Residential Experiences and Student Outcomes

Students experience their residential environments in an integrated way. They don't always make a distinction between learning with their peers or with a faculty/staff member, yet knowing when, where, and with whom a student is learning or is supported can be valuable as practitioners implement programs. Therefore our goal with ACREO is to understand how students perceive the different aspects of their residential environment by exploring their academic experiences and social experiences separately. In this chapter, we consider findings across the following types of residential experiences:

- **Academic Experiences:** We focus on aspects related to students' academic experiences in a number of ways on the survey. We measure students attitudes toward their perceived major-related support system, the level to which they discuss learning experiences and sociocultural issues with peers, and their residential environment's influence on their major. Together these measures demonstrate how students interact with their environment and pinpoint the ones with the most influence.

- **Social Experiences:** Social experiences on campus and in the residence halls are just as important to assess as academic ones. We consider aspects of the student experience such as interactions with faculty unrelated to courses, engagement with residence hall resources, engagement with co-curricular programming, and perception of how supportive the residence hall environment is when discussing social experiences.

Student outcomes across both academic and social domains are the characteristics students develop through participation in their residential environment. We measured student outcomes to determine whether or not students achieve the results we think they should by living in certain residential environments. Most on-campus residential programs have an academic component, which is why we measured outcomes such as academic confidence, major persistence, and career attitudes, as well as self-reported critical thinking disposition and learning integration. We also assessed social outcomes through questions related to sense of belonging, campus engagement, high-risk binge drinking, and bystander intervention tendencies. We present findings for the following academic, intellectual, and social outcomes:

- **Academic Confidence, Major Persistence, and Career Attitudes:** To measure academic confidence, we asked students to rate their perceived confidence to remain enrolled, excel, and complete the upper level required courses with an overall grade point average of B or better in their intended major. We also included measures of students' intent to persist in their major by asking about their plans to remain enrolled in their intended major, thoughts about whether earning a bachelor's degree in their intended major is a realistic goal, and commitment to getting a college degree in their intended major. We measure career attitudes by asking students to rate their confidence in their ability to get a job as well as the extent to which they think that graduating with an undergraduate degree will allow them to get a good job (or graduate school) offer, do work that they would find satisfying, and apply skills developed in their major to their job.

- **Critical Thinking, Intention to Innovate, Financial Literacy, and Learning Integration:** The intellectual outcomes we measured include self-reported critical thinking disposition, intention to innovate, financial literacy, and learning integration. These outcomes are associated with academic and intellectual development, but aren't directly related to students' major choice and career attitudes.

- **Sense of Belonging, Campus Engagement, Binge-drinking, and Bystander Actions:** When we measured sense of belonging, we asked students questions related to their comfort, commitment, support, and acceptance on campus. Campus engagement, however, is measured by asking students to indicate the importance of playing an active role in their community, their belief that their work has a greater purpose for the larger community, and how much they work with others to make their community a better place. We assessed high-risk binge drinking by requesting students to state how often during a two week period they had 5 or more drinks. To measure bystander intervention, we provided students with hypothetical sexual assault situations and asking them to rate their likelihood to intervene based on their relationship with the parties involved. We also inquire about students' bystander reporting knowledge and intention after an event occurs.

Overview of Methods

The purpose of this chapter is to provide an analysis of which residential experiences have the largest role in the student academic and social outcomes measured by ACREO. We also present some semi-conditional results by student demographic characteristics. Our hope is that this chapter will provide practitioners with additional and valuable information useful for making programming and policy decisions.

With the theoretical framework - based on Astin's (1983) I-E-O model - in mind, we conducted a series of multiple linear regression analyses to determine which student characteristics and residential experiences were significantly correlated with the outcomes. Each finding represents the association between the stated experience (e.g., major-related support) and the outcome after accounting for background characteristics and all of the other experiences measured by ACREO.

Instead of focusing solely on providing a table of regression coefficients (which is found in the appendices), we include two matrices that communicates whether an experience is significantly correlated with the outcome, the direction (positive or negative), and the correlation strength. We use one sign to indicate a weak - yet still statistically significant - correlation, two signs to indicate a moderate correlation, and three signs to indicate strong correlation. The strength of the correlations is based on the *p*-values found in the analysis. However, a weak correlation is still significant, just not at the same level as a strong correlation. Also, a plus sign communicates a positive correlation (i.e., as the score in the experience increases, the score in the outcome also increases) and a minus sign communicates a negative correlation (i.e., as the score in the experience increases, the outcome decreases). We also note that all continuous variables were standardized before running the analysis; as such, the advanced reader can interpret those coefficients as effect sizes.

Interpreting Results

We suggest you read this table in a variety of ways. You can, for instance, look down the column of any outcome your department would like to improve, and know to focus resources on those experiences which have significant influence. For high performance areas, you may want to reflect on what practices or environments led to such positive student input and consider ways to maximize or expand those practices. This matrix is also useful if you are interested in knowing what outcomes a signature program is most likely to improve (or not).

Regression Results

Key Findings: Experiences and Outcomes

- **Importance of support systems for academic and career outcomes:** Although we understand that residence life staffs have very little influence on the interactions students have with their family and friends, it seems that a student's perceived support in their major continues to be very important for academic and career success. Students who reported high support in their major had more academic confidence, stronger intentions to persist in their major, and higher career attitudes, on average, than students with weak major-related social support. This experience was also postively related to intellectual outcomes such as critical thinking, integrative learning, and intention to innovate. Perception of major-related support also exhibited a non-trivial, positive effect on campus sense of belonging, suggesting this experince also contributes to an important social outcome. Similar, although smaller, effects were noticed for residential environment's influence on major and non-residential faculty interaction. In practice, we suggest finding ways to combine these major support systems, family, friends, and faculty members. All levels of staff can be mindful of these positive outcomes achieved by these types of interactions outside of the classroom when engaging in one to one dialogue with students or developing co-curricular programming, especially with faculty.

- **Discussion of sociocultural issues are linked with critical thinking:** A non-trivial, positive effect was detected for discussion of sociocultural issues with peers on critical thinking disposition. This finding suggests that students who more frequently discussed major social issues (such as peace, human rights, and justice) and views about multiculturalism and diversity with peers, and/or held discussions with students whose religious beliefs and political opinions were different from their own reported higher levels of critical thinking than students who didn't discuss these issues. The experience of discussing sociocultural issues with peers was also related to other intellectual outcomes, including integrative learning, intention to innovate, and financial literacy, although with a smaller effect.

- **Influence of residential engagement:** While we were initially very surprised to see the negative association that engaging with residence hall resources and residential co-curricular programming has on several of the outcomes, this finding has help year after year. Students who often engage with residential co-curricular programming repeatedly score lower, on average, across most of the outcomes. However, as mentioned above, an academically focused residential environment is positively associated with a number of academic and social outcomes, as is supportive residential environment. Therefore, it is not safe to assume that any residential programming or engagement is inherently related to positive outcomes. Interestingly, while engagement in residential co-curricular programming has a negative association with campus engagement, general co-curricular programming engagement has a non-trivial, positive relationship with this outcome. It seems that students are expressing a distinction between programing within residence and support within residence. This again highlights how in-hall programming is not necessarily a catch-all for supporting students' various needs. We suggest investigating how programming models or requirements might be affecting staff engagement with students on other, more personal intentional levels, and if those programs truly achieve the desired outcomes.

Exhibit 1

Matrix of Residential Experiences and Academic, Career, and Intellectual Outcomes

	Academic Confidence	Major Persistence Intention	Career Attitudes	Critical Thinking Disposition	Integrative Learning	Intention to Innovate	Financial Literacy
Academic Experiences							
Perception of major-related support system	● NTP	● NTP	● NTP	○ TP	○ TP	○ TP	
Discussed learning experiences with peers			○ TN	○ TN		○ TN	
Discussed sociocultural issues with peers		○ TP		● NTP	○ TP	○ TP	○ TP
Residential environment's influence on major	○ TP	○ TP	○ TP	○ TP	○ TP	○ TP	
Social Experiences							
General non-academic faculty interaction			○ TP	○ TP	○ TP	○ TP	○ TN
Residential resource engagement							
Residential co-curricular programming engagement	○ TN	○ TN	○ TN	○ TN	○ TN	○ TN	○ TN
General co-curricular programming engagement	○ TP		○ TP	○ TP	○ TP	○ TP	○ TP
Perception of peer network			○ TP	○ TP		○ TP	
Supportive residential environment	○ TP	○ TP	○ TP	○ TP	○ TP	○ TP	

● Non-trivial, positive effect, ○ Trivial, positive effect, ● Non-trivial, negative effect, ○ Trivial, negative effect,

Exhibit 2

Matrix of Residential Experiences and Social Outcomes

Legend: ●+ Non-trivial, positive effect | ●− Non-trivial, negative effect | ○+ Trivial, positive effect | ○− Trivial, negative effect

	Campus Engagement	Campus Sense of Belonging	High-risk Binge Drinking	Bystander Intervention at a Party	Bystander Intervention in Partner Violence	Bystander Intervention in Racial Slur	Bystander Knowledge	Bystander Reporting Intention
Academic Experiences								
Perception of major-related support system	○+	●+		○+	○+	○+	○+	○+
Discussed learning experiences with peers	○−				○−	○−	○−	○−
Discussed sociocultural issues with peers	○+	○−	○+	○+	○+	○+	○+	
Residential environment's influence on major	○+	○+	○−	○+	○+	○+	○+	○+
Social Experiences								
General non-academic faculty interaction	○+	○+			○+		○+	○+
Residential resource engagement	○−	○−				○−		
Residential co-curricular programming engagement	○−	○−		○−		○−	○−	
General co-curricular programming engagement	●+	○+		○+	○+	○+	○+	
Perception of peer network	○+	○+		○+	○+	○+	○+	○+
Supportive residential environment	○+	●+						

Appendix A
Regression Tables
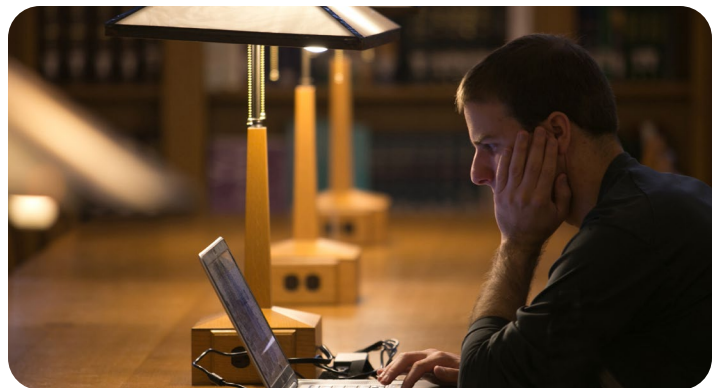
Regression Tables

Below are the coefficients for the regression models referenced in this report. Note that effect coding was used with demographic variables, so inferences should be made between the selected group and the rest of the options for that characteristics (i.e., there is no single reference group; see Mayhew & Simonoff, 2015). Additionally, all continuous variables were standardized and can be interpreted as effect sizes.

Table 1

Regression Coefficients for Academic, Career, and Intellectual Outcomes

	Academic Confidence	Major Persistence Intention	Career Attitudes	Critical Thinking Disposition	Integrative Learning	Intention to Innovate	Financial Literacy
Cisgender man	0.145***	0.028	0.029	0.166***	0.166***	0.023	0.287***
Cisgender woman	-0.034	-0.011	0.017	-0.077*	-0.077*	0.030	-0.277***
Genderqueer/Another gender	-0.111**	-0.017	-0.046	-0.089	-0.089	-0.054	-0.009
Bisexual	0.098**	0.077**	-0.032	0.183***	0.183***	0.072	0.056
Gay	-0.066	0.015	-0.011	-0.162**	-0.162**	-0.008	-0.057
Heterosexual	0.089***	0.034	0.050	-0.022	-0.022	0.071	0.053
Lesbian	-0.133*	-0.146	0.087*	-0.172	-0.172	-0.103	-0.069
Queer/Another sexual orientation	0.012	0.020	-0.094**	0.172**	0.172**	-0.032	0.017
Another race/ethnicity, including Native American	-0.061	0.063	0.063	-0.052	-0.052	0.045	0.025
Asian/Asian American & Pacific Islander	-0.233***	-0.129***	-0.217***	-0.184***	-0.184***	-0.185***	0.089**
Black/African American	0.158**	0.056	0.077	0.061	0.061	0.071	-0.169*
Latina/o/x/Hispanic	0.039	0.030	0.056	0.075*	0.075*	-0.090*	-0.153**
Middle Eastern	-0.100*	-0.172**	-0.101*	-0.047	-0.047	0.160*	0.128
More than one race	0.073*	0.058	0.005	0.072**	0.072**	-0.003	0.008
White	0.123***	0.095***	0.117***	0.076**	0.076**	0.002	0.071
Agnosticism	0.002	-0.039	-0.056	0.095***	0.095***	-0.053*	0.118**
Another worldview	0.030	-0.020	0.035	-0.035	-0.035	0.025	-0.032
Atheism	-0.024	-0.012	-0.067***	0.036*	0.036*	-0.047	0.098
Buddhism	-0.092	-0.085*	-0.032	-0.108	-0.108	0.060	-0.115*
Christianity	-0.004	-0.014	0.067*	-0.102**	-0.102**	-0.011	-0.015
Hinduism	0.119*	0.126*	0.182***	-0.003	-0.003	0.167*	-0.102
Islam	-0.005	0.083	0.029	0.068**	0.068**	-0.096**	-0.104
Judaism	-0.012	0.019	-0.094**	-0.016	-0.016	0.002	0.003
More than one worldview	-0.013	-0.058*	-0.064*	0.065	0.065	-0.048	0.149*

*p<0.05, **p<0.01, ***p<0.001

	Academic Confidence	Major Persistence Intention	Career Attitudes	Critical Thinking Disposition	Integrative Learning	Intention to Innovate	Financial Literacy
First Year	-0.147**	-0.232***	0.028	0.002	0.002		-0.049
Second Year	-0.035	0.004	-0.077	0.024	0.024	-0.025	0.025
Third Year	0.086**	0.199***	-0.112*	0.027	0.027	-0.014	-0.046
Fourth Year	0.042	0.042	-0.044	0.084**	0.084**	-0.015	-0.004
Fifth Year or higher	0.054	-0.012	0.205	-0.137	-0.137	0.079	0.074
Arts & Humanities Major	0.147**	0.119*	-0.273***	0.220***	0.220***	-0.003	-0.150*
Business Major	0.012	0.059	0.070	-0.123***	-0.123***	0.119**	0.285**
Health Sciences Major	-0.019	0.193***	0.239***	-0.207*	-0.207*	-0.056	-0.079
STEM Major	-0.130***	0.077	0.093***	-0.050	-0.050	-0.044*	0.131**
Social Sciences Major	0.183***	0.190***	0.036*	0.115***	0.115***	0.056**	-0.065
No Major Selected	-0.193**	-0.639***	-0.165***	0.045	0.045	-0.073*	-0.122***
Nationality (0=Domestic; 1=International)	0.095***	0.010	-0.140***	0.117**	0.117**	0.048	0.146**
Generational Status (0=Continuing-gen; 1=First-gen)	-0.059**	0.016	-0.066	-0.063*	-0.063*	0.017	-0.126*
Transfer student	-0.060	-0.127*	-0.059	-0.027	-0.027	0.067	-0.031
Cumulative College GPA	0.322***	0.099***	0.054**	0.071***	0.071***	0.027	0.098***
Perception of Major Support System	0.237***	0.261***	0.319***	0.058**	0.058**	0.167***	-0.010
Discussed Learning Experiences with Peers	0.000	0.005	-0.025*	-0.051**	-0.051**	-0.027*	0.024
Discussed Sociocultural Issues with Peers	0.022	0.031*	-0.020	0.215***	0.215***	0.046**	0.070**
Residential Environment's Influence on Major	0.097***	0.064***	0.105***	0.047***	0.047***	0.104***	-0.012
Non-academic Faculty Interaction	-0.003	-0.005	0.044**	0.026***	0.026***	0.077***	-0.044**
Residential Resource Engagement	-0.018	-0.033	-0.018	-0.043	-0.043	-0.006	-0.047
Residential Co-curricular Programming	-0.086***	-0.102**	-0.060***	-0.118**	-0.118**	-0.102***	-0.141***
General Co-curricular Programming	0.043**	0.006	0.054***	0.167***	0.167***	0.174***	0.122***
Perception of Peer Network	0.026	0.006	0.055*	0.045*	0.045*	0.070**	-0.010
Supportive Residential Environment	0.034**	0.038**	0.045*	0.028*	0.028*	0.068*	0.037
Observations	9432	9430	9462	9428	9428	9431	6128
R-squared	.312	.218	.277	.163	.163	.174	.181

*p<0.05, **p<0.01, ***p<0.001

Table 2

Regression Coefficients for Social Outcomes

	Campus Engagement	Campus Sense of Belonging	High-risk Binge Drinking	Bystander Intervention at a Party	Bystander Intervention in Partner Violence	Bystander Intervention in Racial Slur	Bystander Knowledge	Bystander Reporting Intention
Cisgender Man	-0.116**	0.056**	0.070**	-0.178***	0.045	0.009	0.012	-0.003
Cisgender Woman	0.090***	0.061*	-0.001	0.157*	0.020	0.077	0.036	0.037
Genderqueer/Another Gender	0.026	-0.118**	-0.070	0.021	-0.065	-0.085	-0.049	-0.034
Bisexual	-0.031	-0.038	0.011	0.224**	0.170**	0.185 **	0.057	0.099
Gay	0.145**	0.114*	0.085	0.050	-0.020	0.016	-0.007	0.022
Heterosexual	-0.011	0.009	0.050	-0.029	0.000	-0.055	0.018	0.064*
Lesbian	-0.153*	0.023	-0.043	-0.302**	-0.159	-0.156	-0.081	-0.207*
Queer/Another sexual orientation	0.051	-0.109**	-0.103*	0.058	0.009	0.010	0.013	0.022
Another race/ethnicity, including Native American	0.017	-0.050	-0.020	-0.131	0.080*	-0.019	-0.077	-0.068
Asian/Asian American & Pacific Islander	-0.093***	0.013	-0.122**	-0.131**	-0.153***	-0.181 ***	-0.243***	-0.080**
Black/African American	-0.004	-0.145*	-0.107*	-0.109	-0.064	0.179	0.052	0.071
Latina/o/x/Hispanic	0.025	-0.008	0.039	0.289**	0.172*	0.185 ***	0.010	0.101
Middle Eastern	0.047	0.116*	-0.059	0.008	-0.001	-0.080	0.063*	0.060
More than one race	-0.009	0.002	0.097**	0.070	-0.026	0.011	0.041	-0.059
White	0.016	0.071*	0.171***	0.004	-0.007	-0.096 **	0.154***	-0.025
Agnosticism	-0.108**	-0.037	0.064	0.012	-0.020	0.009	-0.024	-0.039
Another worldview	0.012	-0.016	-0.021	-0.035	-0.019	-0.079	-0.026	-0.056
Atheism	-0.164***	-0.054*	0.033	-0.075*	-0.013	-0.041	-0.059*	0.005
Buddhism	0.009	-0.083*	0.111**	0.110	0.106	0.047	0.014	0.032
Christianity	0.073*	0.007	-0.057***	-0.068*	-0.029	-0.108 *	-0.049	-0.035
Hinduism	0.094	0.115**	0.087	0.075	-0.003	0.003	0.053	0.066
Islam	0.088	0.057	-0.249***	0.039	0.215*	0.110 *	0.122**	0.176**
Judaism	0.014	0.076*	0.072	-0.089	-0.233**	0.046	-0.031	-0.066
More than one worldview	-0.019	-0.065*	-0.040	0.032	-0.004	0.012	0.001	-0.083
First Year	0.016	-0.042	-0.046	0.028	0.075	0.149 **	0.068	-0.024
Second Year	0.006	-0.008	-0.036	0.046	0.012	0.141 **	0.005	-0.038
Third Year	0.011	-0.017	-0.024	0.033	-0.018	0.090	0.005	0.009
Fourth Year	0.020	-0.019	0.044	-0.101*	-0.066	-0.005	0.054	0.071
Fifth Year or higher	-0.054	0.086	0.062	-0.006	-0.002	-0.375	-0.131	-0.019

*p<0.05, **p<0.01, ***p<0.001

	Campus Engagement	Campus Sense of Belonging	High-risk Binge Drinking	Bystander Intervention at a Party	Bystander Intervention in Partner Violence	Bystander Intervention in Racial Slur	Bystander Knowledge	Bystander Reporting Intention
Arts & Humanities Major	-0.065*	-0.053*	-0.136**	0.121	0.052	0.084 **	-0.012	0.036
Business Major	-0.042	0.051**	0.169**	-0.030	0.028	-0.040	0.066	-0.044
Health Sciences Major	0.112**	0.009	0.043	-0.065**	-0.054	-0.069	0.013	0.043
STEM Major	-0.028	-0.010	-0.132**	-0.028	-0.029	-0.056	-0.071**	-0.055
Social Sciences Major	0.103**	0.089**	0.021	0.019	-0.013	0.029	0.081*	0.075*
No Major Selected	-0.080	-0.087**	0.035	-0.017	0.016	0.052	-0.077*	-0.055
Nationality (0=Domestic; 1=International)	-0.070	-0.018	-0.032	-0.232**	-0.119**	-0.151 ***	-0.208***	0.008
Generational Status (0=Continuing-gen; 1=First-gen)	0.005	-0.076**	-0.092**	0.043	0.069	0.046	-0.025	0.024
Transfer student	-0.055*	-0.154***	-0.002	-0.032	-0.010	-0.018	-0.071	0.053
Cumulative College GPA	0.040**	0.027	-0.082***	-0.026*	-0.049**	-0.015	-0.059***	-0.031**
Perception of Major Support System	0.135***	0.205***	0.001	0.074**	0.057*	0.063 **	0.119***	0.111***
Discussed Learning Experiences with Peers	-0.032*	-0.001	0.022	-0.040	-0.044**	-0.068 **	-0.051**	-0.039*
Discussed Sociocultural Issues with Peers	0.057***	-0.032***	0.050*	0.098***	0.096***	0.149 ***	0.057**	0.006
Residential Environment's Influence on Major	0.092***	0.138***	-0.045***	0.078**	0.058**	0.065 **	0.086***	0.076***
General Non-academic Faculty Interaction	0.036**	0.019*	0.033	0.022	0.046*	0.012	0.027*	0.059***
Residential Resource Engagement	-0.043*	-0.030*	-0.050	-0.022	0.006	-0.079 ***	-0.031	-0.008
Residential Co-curricular Programming	-0.093**	-0.104***	0.019	-0.032*	0.016	-0.072 **	-0.054*	-0.025
General Co-curricular Programming	0.321***	0.190***	0.008	0.097***	0.038**	0.113 ***	0.079***	0.033
Perception of Peer Network	0.091***	0.114***	0.035	0.051*	0.071**	0.064 **	0.088**	0.071**
Supportive Residential Environment	0.050**	0.293***	0.011	0.001	0.002	0.023	0.029	0.012
Observations	9463	9410	9499	5963	6018	4901	9199	9251
R-squared	.251	.399	.051	.113	.076	.093	.122	.06

*p<0.05, **p<0.01, ***p<0.001

"Based on their expertise in leadership, co-curricular educators are in a distinctive position to assist the institution in realizing higher education's value and purpose of educating students for engaged citizenship."

(Mayhew et al., 2016, p. 599)

ACREO

Assessment of Collegiate Residential
Environments and Outcomes