A Matter of Degrees

Promising Practices for Community College Student Success
A First Look

CCCSE
Center for Community College Student Engagement
Acknowledgments

Community colleges currently are experiencing perhaps the highest expectations and the greatest challenges in their history. Facing fiscal constraint, enrollment pressures, and summons to support economic recovery, these institutions also are rising to a new clarion call: the “community college completion challenge.” Never has it been so clear that the futures of individuals, communities, and the nation rest significantly on the ability of community and technical colleges to ensure that far greater numbers of their students succeed in college, attain high-quality certificates and degrees, and transfer to baccalaureate institutions.

As the student success and college completion agenda builds momentum across the land, there is understandably a growing demand for useful information regarding effective educational practices. Fortunately, there also is emerging evidence regarding a collection of promising practices — strategies that appear to be associated with a variety of indicators of student progress and success. This report, the first in a series, describes a new phase of work at the Center for Community College Student Engagement that aims to contribute further to that growing body of knowledge about what works in promoting student success.

The Center’s work builds on our own research but also on the work of others: the Community College Research Center and Center for Postsecondary Research at Teachers College, Columbia University; other university-based researchers, including colleagues at The University of Texas; and colleagues in the national Achieving the Dream initiative, the new Completion by Design initiative, and numerous other serious efforts aimed at improving community college education. Special thanks are due to the hundreds of community colleges and hundreds of thousands of students and faculty who have participated in the Center’s surveys, as well as those whose voices are lifted up through our focus group work. The findings presented in this report are made possible through the generous support of the Bill & Melinda Gates Foundation, Houston Endowment Inc., Lumina Foundation for Education, and MetLife Foundation.

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Supported by grants from
Bill & Melinda Gates Foundation
Houston Endowment Inc.
Lumina Foundation for Education
MetLife Foundation

Co-sponsored by
The Carnegie Foundation for the Advancement of Teaching

Published by the Center for Community College Student Engagement.

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Please cite this report as: Center for Community College Student Engagement. (2012). A Matter of Degrees: Promising Practices for Community College Student Success (A First Look). Austin, TX: The University of Texas at Austin, Community College Leadership Program.
“Do not zero in on finding the silver bullet. There aren’t any. The effects of college are cumulative across a range of activities.”

— Patrick Terenzini
Distinguished Professor and Senior Scientist, Emeritus
Center for the Study of Higher Education
The Pennsylvania State University
Helping Colleges Invest in Success

Community colleges across the country have created innovative, data-informed programs that are models for educating underprepared students, engaging traditionally underserved students, and helping students from all backgrounds succeed. However, because most of these programs have limited scope, the field now has pockets of success rather than widespread improvement. Turning these many small accomplishments into broad achievement — and improved completion rates — depends on bringing effective programs to scale.

To meet this challenge while facing shrinking budgets and rising enrollment, colleges must be certain that all of their resources — time and money — are being spent on educational practices that work for all students. But what makes a practice effective? And how can colleges identify the mix of practices they should use to close achievement gaps so all students succeed?

To help colleges answer these questions, the Center for Community College Student Engagement has launched a special initiative, Identifying and Promoting High-Impact Educational Practices in Community Colleges. This report presents the initiative’s preliminary findings.

Community colleges are increasingly aware of the need to substantially increase the completion of certificates and degrees. But there now is unprecedented urgency for this work because having more successful community college graduates is essential to sustaining our local and national economies as well as maintaining strong communities with engaged citizens.

This report describes 13 promising practices in community colleges. Over the next three years, the Center will conduct additional data analysis, hold focus groups with students and faculty members, and continue the review of efforts under way in community colleges. This work will contribute significant new knowledge about high-impact educational practices and how they are associated with student engagement, persistence, and completion in community colleges.

Colleges will be able to use these and future findings to make sound, evidence-based decisions about how to focus institutional energy, reallocate limited resources, design more effective programs, and bring strong programs to more students.

“If we are going to make a substantial dent in completion rates, we must ask, ‘How can we reshape students’ experience in the one place where they will be while they are on campus: in the classroom?’”

— Vincent Tinto
Distinguished Professor
Syracuse University
Identifying and Promoting High-Impact Educational Practices

The Center’s initiative on high-impact practices is a multiyear effort that draws on data from students, faculty members, and colleges. Findings from surveys and focus groups will be presented in a series of reports.

This report provides a first look at the data on promising practices. These are educational practices for which there is emerging evidence of success: research from the field and from multiple colleges with multiple semesters of data showing improvement on an array of metrics, such as course completion, retention, and graduation.

This first look describes the promising practices from four perspectives: entering students describing their earliest college experiences, students addressing their overall college experiences, faculty members providing their perceptions of student engagement, and colleges focusing on their use of the practices.

Colleges can use these initial findings as they examine their use of these promising practices. Moreover, while this first-look report addresses practices individually, looking at data across the practices highlights incongruities that colleges must address if they are to improve outcomes. For example, 79% of entering students report that they plan to earn an associate degree, but just 45% of full-time students meet that goal within six years. Colleges can use these incongruities to focus discussions about what outcomes are most important and what policies and practices are most likely to result in those outcomes.

After additional data collection and analyses, the Center will report on high-impact practices for success and completion at community colleges. Subsequent reporting will aim to identify and define high-impact practices by examining the student, faculty, and institutional data about promising practices in relationship to overall levels of student engagement as well as student outcome data.

The Center’s examination of educational practices includes the Center’s four quantitative surveys, qualitative data from focus groups and interviews with students and faculty, and an extensive review of existing research. As part of this work, the Center introduced the Community College Institutional Survey (CCIS) as well as new items on promising practices for its surveys of entering students, the overall student population, and faculty. (See p. 4 for details about the surveys used for the high-impact practices project.)

Data collection from CCIS and the additional promising practices items from the other surveys will continue through 2012 and beyond, and all community colleges are invited to participate.

The Center Opposes Ranking

The Center opposes using its data to rank colleges for a number of reasons:

- There is no single number that can adequately — or accurately — describe a college’s performance; most colleges will perform relatively well on some benchmarks and need improvement on others.
- Each community college’s performance should be considered in terms of its mission, institutional focus, and student characteristics.
- Because of differences in these areas — and variations in college resources — comparing survey results among individual institutions serves little constructive purpose and likely will be misleading.
- Participating colleges are a self-selected group. Their choice to participate in the survey demonstrates their interest in assessing and improving their educational practices, and it distinguishes them. Ranking within this group of colleges — those willing to step up to serious self-assessment and public reporting — might discourage participation and certainly would paint an incomplete picture.
- Ranking does not serve a purpose related to improving student outcomes. Improvement over time — where a particular college is now compared with where it wants to be — is likely the best gauge of a college’s efforts to enhance student learning and persistence.

“We have in our arsenal ways to engage students in substantive ways. We know a lot more about what works than we use.”

George Kuh
Chancellor’s Professor Emeritus
Indiana University, Bloomington
Four Surveys, Four Perspectives
SENSE, CCSSE, CCFSSE, and CCIS

The Center administers four surveys that complement one another: Survey of Entering Student Engagement (SENSE), Community College Survey of Student Engagement (CCSSE), Community College Faculty Survey of Student Engagement (CCFSSE), and Community College Institutional Survey (CCIS). All are tools that assess student engagement — how connected students are to college faculty and staff, other students, and their studies — and institutional practice.

Each of the four surveys collects data from a particular perspective, and together they provide a comprehensive understanding of educational practices on community college campuses and how these practices influence students’ experiences.

SENSE is administered during weeks four and five of the fall academic term in classes most likely to enroll first-time students. SENSE focuses on students’ experiences from the time of their decision to attend their college through the end of the first three weeks of the fall term. The survey collects data on practices that are most likely to strengthen early student engagement. Entering students are those who indicate that it is their first time at the college where the survey is administered.

CCSSE, administered in the spring, surveys credit students and gathers information about their overall college experience. It focuses on educational practices and student behaviors associated with higher levels of learning, persistence, and completion.

CCFSSE is administered in conjunction with CCSSE to all faculty teaching credit courses in the academic term during which the college is participating in the student survey. The faculty survey reports on instructors’ perceptions about student experiences as well as data about their teaching practices and use of professional time.

CCIS, the Center’s newest instrument, was developed as part of the Center’s initiative on identifying and promoting high-impact educational practices in community colleges. CCIS collects information about whether and how colleges implement a variety of promising practices.

Note: CCIS results are preliminary and based on a sample of colleges. Due to the survey’s branching structure and the possibility of non-response across various items, the number of respondents for each item ranges from 48 to 288 colleges; representativeness, therefore, varies from item to item. For clarity, each data point presented is accompanied by the number of colleges that responded to the relevant survey item. The data set will be expanded through future survey administrations.

Quantitative and Qualitative Data
The Center uses both quantitative and qualitative data to paint a complete picture of students’ college experiences. The four surveys provide detailed quantitative data, and the Center gathers qualitative data through focus groups and interviews with students, faculty, student services professionals, and college presidents.

The Center’s survey data help colleges better understand what is happening. Information from focus groups and interviews can help them begin to figure out why.

The Power of Multiple Perspectives
The Center encourages colleges to examine data across surveys while cautioning that the ability to make direct comparisons may be limited. For example, with the CCSSE instrument, students report their personal experiences, while with CCFSSE, faculty members indicate their perceptions of student experiences in the college.

Nonetheless, when there is a gap between the student experience and the faculty’s perception of that experience, the data can inspire powerful conversations about why an apparent gap exists and what it may mean. Many Center member colleges report that looking at student and faculty data side-by-side has been the impetus for significant faculty-led change on their campuses.

Core Surveys and Special-Focus Modules
SENSE and CCSSE each have a core set of survey items, which is the same from year to year, as well as a mechanism to add items that can change from year to year. The core surveys provide a large sample of data that is stable over time while special-focus items and modules examine areas of student experience and institutional performance that are of particular interest to the field. Special-focus items for the 2011 and 2012 surveys address promising practices for promoting student success and completion.
Design Principles for Effective Practice

The Center’s multiyear project uses input from students, faculty, and college leaders to explore the relative and combined value of 13 promising educational practices. The project builds on institutional work and a body of research about current practices and their results.

However, the effectiveness of any educational practice depends on its specific design and quality of implementation. At colleges across the country, the practices described in this report are implemented in a variety of ways and, as a result, their effectiveness can differ dramatically.

There is emerging consensus that certain design principles are critical for student success. No matter what program or practice a college implements, it is likely to have a greater impact if its design incorporates the following principles.

- **A strong start.** Focusing attention on the front door of the college — ensuring that students’ earliest contacts and first weeks incorporate experiences that will foster personal connections and enhance their chances of success — is a smart investment.

- **Clear, coherent pathways.** The many choices and options students face as they endeavor to navigate through college systems can create unnecessary confusion — and inhibit students’ success. Colleges can improve student success (and minimize ill-used time) by creating coherent pathways that help students move through an engaging collegiate experience.

- **Integrated support.** Time is a resource — one of the most important resources a college has — and it is finite. A large part of improving success involves effectively connecting with students where they are most likely to be: in the classroom. This means building support, such as skills development and supplemental instruction, into coursework rather than referring students to services that are separate from the learning experience.

- **High expectations and high support.** Students do their best when the bar is high but within reach. Setting a high standard and then giving students the necessary support — academic planning, academic support, financial aid, and so on — makes the standard attainable.

The body of evidence about these design principles is growing. Even as we continue to learn, colleges must act on it. Improving student engagement and attainment cannot be the work of a select team or an isolated department. To achieve the needed scale, faculty and staff must collaborate across departments and throughout the college. Then, more students will experience — and benefit from — all their colleges have to offer.
Characteristics of Community College Students

Students Balance Priorities

Most students attend classes and study while working; caring for dependents; and juggling personal, academic, and financial challenges. Colleges can help students plan their coursework around their other commitments and help students develop skills to manage the demands on their time.

67% of full-time students and 78% of part-time students work at least one hour per week while taking classes. 53% of full-time students and 60% of part-time students care for dependents at least one hour per week.

Entering Students’ Aspirations

The data show a sizable gap between the percentage of students who aim to complete a credential and the percentage of those who actually do.

Please indicate whether your goal(s) for attending this college include the following:

- Complete a certificate program (N=70,427) 57%
- Obtain an associate degree (N=71,138) 79%
- Transfer to a four-year college or university (N=70,378) 73%

Respondents may indicate more than one goal.

Source: 2010 SENSE Cohort data.

Fewer than Half of Students Reach Their Goal

Fewer than half of entering community college students with a goal of earning a degree or certificate meet their goal within six years after beginning college.

Met their goal within six years

45%

Percentage of Students Who Are Underprepared

**SENSE** respondents (entering students) who report their placement tests indicated they needed developmental coursework in at least one area \( (N=75,587) \)

- **66%**

**CCSSE Promising Practices** respondents who report that they took a placement test and the test indicated that they needed developmental education in at least one area \( (N=121,114) \)

- **56%**

Source: 2010 SENSE Cohort data.


Students’ Plans after the Current Semester

As asked about their plans after the current semester, 22% of **CCSSE** respondents report that they have no plan to return to this college or are uncertain about their future plans. These data suggest an opportunity for colleges to help students establish academic plans and pathways that will help them persist in college.

- **66%**

Source: 2011 CCSSE Cohort data.

Student and Faculty Views: What Stands between Students and Their Aspirations

**CCSSE** and **CCFSSE** data indicate that many faculty are more likely than students to believe that various circumstances, including working full-time, caring for dependents, or being academically underprepared, would be likely causes for students to withdraw from classes or college.

- **Working full-time** \( (N=434,142) \)
- **38%**

- **Caring for dependents** \( (N=433,003) \)
- **28%**

- **Being academically unprepared** \( (N=431,316) \)
- **19%**

- **Lacking finances** \( (N=432,734) \)
- **49%**

Source: 2011 CCSSE Cohort data.

**How likely is it that the following issues would cause students to withdraw from class or this college?**

**Faculty responding likely or very likely**

- **Working full-time** \( (N=35,245) \)
- **81%**

- **Caring for dependents** \( (N=35,163) \)
- **73%**

- **Being academically unprepared** \( (N=35,217) \)
- **78%**

- **Lacking finances** \( (N=35,145) \)
- **73%**

Source: 2011 CCFSSE Cohort data.
Planning for Success

Assessment and Placement

“I’ve always been good in every subject I’ve taken, so it was a shock to me that I was right on the borderline.”

— Student

Completing developmental education requirements early is related to higher overall achievement, and students can’t complete if they don’t enroll. Research suggests that students who need developmental education and enroll in the proper courses during their first term are more likely to complete their developmental sequence than are students who need developmental education but do not attempt any developmental courses during their first term.¹

Large numbers of students are being assessed and placed into developmental education. Among SENSE respondents (N=73,299), 88% report that they were required to take a placement test. In addition, 82% of SENSE Promising Practices respondents (N=23,470) who reported their placement test results indicated they needed developmental education also reported they were required to take at least one developmental education course in their first semester.

CCSSE Promising Practices data show slightly lower figures: 74% of respondents (N=128,924) report that they were required to take a placement test. Of those students whose placement tests indicated that they needed developmental education (N=71,167), 68% say they were told that they were required to take a developmental course in their first term.

These high responses for testing and moderate responses for placement still leave 12% of SENSE respondents (N=73,299) and 26% of CCSSE Promising Practices respondents (N=128,924) who indicate that they did not have to take a placement test.

Making sure that students take the right classes is a multistep process. Colleges should create opportunities for students to participate in review or brush-up experiences before placement tests to minimize the amount of remediation students need. Then, after students have been assessed, those who still need remediation should be placed into developmental pathways where they will have a stronger chance to succeed rather than multiple opportunities to fail.

“My developmental class is ridiculously easy.”

— Student
Assessment and Proper Enrollment: Most Students Are Taking Placement Tests and Properly Enrolling

**Student Responses**

**Most Students Are Required to Take Placement Tests and Enroll in Needed Courses**

Percentage of students who report that they are required to take reading, writing, and/or math placement tests before registering for their first semester

- 74% (94,853 of 128,924)

Among students who report taking a placement test and needing developmental education, the percentage who say they were told they were required to take at least one developmental education course in their first term

- 68% (48,648 of 71,167)


Among students who report taking a placement test, the percentage who report that the test indicated that they needed developmental education in at least one area

- 72% (68,125 of 93,989)

Among students who say they were told they were required to take at least one developmental education course in their first term, the percentage who say they actually enrolled in at least one developmental education class

- 83% (56,900 of 68,624)


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“I have no idea why I got placed where I was.”
— Student

Among entering students who report taking a placement test and needing developmental education, the percentage who say they were told they were required to take at least one developmental education course in their first term

- 82% (19,327 of 23,470)


Among entering students who say they were told they were required to take at least one developmental education course in their first term, the percentage who actually enrolled in at least one developmental education class

- 88% (21,399 of 24,201)

Assessment and Proper Enrollment: Testing Alone Isn’t Enough

**Student Responses**

Many Students Do Not Prepare for Placement Tests

Before enrolling at this college, I used online or printed materials provided by the college to help me prepare on my own for this college’s placement test(s).

- **28%** Yes (36,650 of 131,314)

Before enrolling at this college, I participated in a brief (8 hours or less), intensive brushup/refresher workshop designed to help me prepare for this college’s placement test(s).

- **10%** Yes (13,498 of 131,353)

Before enrolling at this college, I participated in a multiday or multiweek brushup/refresher program (often held during the summer before fall enrollment) designed to help me prepare for this college’s placement test(s).

- **9%** Yes (12,239 of 131,232)

College Responses

Many Colleges Offer Prep Experiences, but Few Require Them

Percentage of colleges that say they offer some form of placement test-prep experience for reading, writing, or math

- **44%** Yes (83 of 187)

Percentage of colleges offering a test-prep experience that report the test prep is mandatory for all first-time students, including full-time students and part-time students

- **13%** Yes (11 of 83)
Orientation

“At orientation, they took us around the whole campus, anywhere we wanted to go, and showed us everything, so I was familiar with the school before I started.”
— Student

Colleges use a variety of approaches to student orientation. Orientation can be a single two-hour session that helps students find their way around campus, explains registration, and mentions support services. It also can be incorporated into a full-semester program, such as a student success course. Or it can be anything in between. Typically, however, an orientation is an experience that helps students know what they most need to know before classes begin.

Research shows that orientation services lead to higher student satisfaction, greater use of student support services, and improved retention of at-risk students. Yet after three weeks of college, 19% of entering students (14,416 of 74,261) are unaware of an orientation program.

Among those colleges reporting on CCIS that they have an orientation program (276 of 288), just 38% report that they require it for all first-time (full-time and part-time) students. The most frequently cited components of orientation are information about and/or use of the college’s personal/social support services; information about and/or use of the college’s academic support network; and use of information resources (e.g., library, finding and evaluating sources).

“[Online orientation was] a couple of people talking about the campus, and then you took a test about what they said. I would have preferred to come to school to walk around.”
— Student

Academic Goal Setting and Planning

“I have my whole plan ... all my credits to transfer, exactly what classes and everything. It helps a lot financially and keeps you on track. It just keeps you motivated.”
— Student

Attaining a goal becomes dramatically easier when the goal is specific and the path to reaching it is clear. Defining this path is the work of academic goal setting and planning.

Ninety-one percent of CCSSE respondents (376,899 of 414,646) report that academic advising/planning is a somewhat or very important service. SENSE data, however, indicate that many entering students are not getting the kind of advising that will help them most. While 71% of SENSE respondents (52,112 of 73,502) agree or strongly agree that an advisor helped them identify the courses they needed to take during their first academic term, only 38% (27,936 of 73,406) agree or strongly agree that an advisor helped them set academic goals and create a plan for achieving them. An even smaller proportion, 26% (19,085 of 73,488) indicate that someone talked to them about their outside commitments while helping them decide how many courses to take during their first term.

While academic planning certainly includes course selection, community college students need advising that helps them set and maintain long-term goals. This type of advising and planning centers on creating a clear path from where students are now to their ultimate educational goals. Regular advising provides opportunities to update the plan to respond to changing goals, interests, or circumstances. The academic plan keeps students focused because it shows how each course brings them closer to a key milestone and, ultimately, to the certificate or degree they seek.

“I feel like I’m wasting time because counselors just write down the classes you need and give you the paper.”
— Student
Academic Advising and Planning

**Entering Student Responses**

Nearly Half of Students Do Not Use Advising and Planning Services

How often did you use academic advising/planning services from the time of your decision to attend this college through the end of the first three weeks of your first semester/quarter? *(N=70,179)*

- **Never**: 46%

Source: 2010 SENSE Cohort data.

**Entering Students’ Experience with Academic Advising**

Percentage of students responding *agree or strongly agree*

- An advisor helped me to identify the courses I needed to take during my first semester/quarter *(52,112 of 73,502)*: 71%
- An advisor helped me to select a course of study, program, or major *(44,340 of 73,513)*: 60%
- An advisor helped me to set academic goals and to create a plan for achieving them *(27,936 of 73,406)*: 38%
- A college staff member talked with me about my commitments outside of school (work, children, dependents, etc.) to help me figure out how many courses to take *(19,085 of 73,488)*: 26%

Source: 2010 SENSE Cohort data.

**Faculty Responses**

**Faculty Members’ Involvement in Advising**

How often do you refer students to academic advising/planning services?

- Full-time faculty: **85%** *(15,317 of 18,055)*
- Part-time faculty: **71%** *(12,295 of 17,298)*

Source: 2011 CCFSSE Cohort data.

**During the current academic year, is academic advising part of your teaching role at this college?**

- Full-time faculty: **55%** *(10,921 of 18,611)*
- Part-time faculty: **7%** *(1,347 of 18,219)*

Source: 2011 CCFSSE Cohort data.
Registration before Classes Begin

Students who register after the first meeting of a class (late registration) may be decreasing their chances for success before even walking through the classroom door. Late registration correlates with lower grades, lower completion rates, and lower re-enrollment the following term.

Many colleges, however, continue to permit late registration. Moreover, even colleges with policies forbidding late registration tend to be inconsistent in enforcing them.

Some colleges permit late registration because they do not want to turn interested students away. But colleges do not have to shut the door on late registrants. Instead, they can offer options such as late-start classes or intensive experiences for refreshing academic skills.

Eleven percent of CCSSE respondents (26,828 of 238,504) and 8% of SENSE respondents (2,629 of 34,266) say they registered after the first class session for at least one class.

Among CCIS colleges, 134 respondents report the incidence of late registration. Of these colleges, only 10 (7%) say that no registration occurred after the first class meeting. Among the colleges indicating that they have a policy of prohibiting late registration, 63% (30 of 48) report that they still have some incidence of late registration.
Initiating Success

Accelerated or Fast-Track Developmental Education

“In remedial classes, they need to place you with students who are going to learn at the same pace as you.”

— Student

The longer it takes a student to move through developmental education into a credit program, the more likely he or she is to drop out. For example, students who place three or more levels below college-level in math, reading, or English can take more than two years to reach and pass their first college-level courses — if, in fact, they ever complete the developmental sequence. Accelerated or fast-track developmental programs can both enhance learning and engagement and help students move into college-level work more quickly.

A growing number of colleges are designing accelerated or fast-track developmental education programs so students can focus on specific, targeted issues for remediation; move through developmental education at their own pace; and most important, move into college-level work more quickly. Research indicates that well-designed accelerated programs are efficient — and that students in these intensive courses perform equally as well, or better than, students in traditional developmental education.

Among the 120 CCIS respondents that have accelerated or fast-track developmental education programs, 13% indicate that they require these programs for all first-time (full-time and part-time) developmental students. The most prominently cited components of this practice are tutoring, information about and/or use of the college’s academic support network, and basic technology skills (e.g., using the Internet, word processing).

First-Year Experience

“The first-year experience learning community is a big help with the transfer from high school. When I got to class, I [thought], ‘Is this it? It isn’t scary at all.’”

— Student

First-year experience programs create a small community within the larger campus for first-year students, helping them build relationships with other students as well as faculty and staff.

Students who participate in first-year experience programs demonstrate more positive relationships with faculty, greater knowledge and use of campus resources, more involvement in campus activities, and better time-management skills than their non-participating peers.

Of the 166 CCIS respondents that report having first-year experience programs, 27% indicate that they require these programs for all first-time (full-time and part-time) students. The most prominently cited components of this practice are time-management skills, information about and/or use of the college’s academic support network, and information about and/or use of the college’s personal/social support services.
Student Success Course

Student success courses help students build knowledge and skills essential for success in college, from study and time-management skills to awareness of campus facilities and support services. Research indicates that students who complete these courses are more likely to complete other courses, earn better grades, have higher overall GPAs, and obtain degrees. Of the 238 CCIS respondents that report having student success courses, 15% indicate that they require these courses for all first-time (full-time and part-time) students. The most prominently cited components of this practice are study skills, time-management skills, and note-taking skills.

“Since I’ve never been to college before, I took the class with study skills, writing, and research. It’s everything built into one class. It’s helpful. It is.” — Student

Learning Community

“Your papers are going to be on Mexican-American history, but you’re still learning the essential skills you need for English 101. It’s a good idea and fun.” — Student

Learning communities generally involve a group of students taking two or more linked classes together as a cohort, ideally with the instructors of those classes coordinating course outlines and assignments as well as jointly reviewing student progress. Learning communities build a sense of academic and social community and increase engagement among students and faculty, all of which lead to a variety of positive outcomes. These may include improved academic achievement, as measured by GPA, credit accumulation, and self-reported learning. The literature suggests that participating students also demonstrate greater progress in academic subjects, indicate increased satisfaction with the college, and report greater use of student support services. Taken together, these characteristics may lead to improved retention and learning outcomes.

Of the 160 CCIS respondents that report having learning communities, only 1% indicate that they require these learning communities for all first-time (full-time and part-time) students. The most prominently cited components of this practice are use of information resources (e.g., library, finding and evaluating sources), study/assignments focused on a common theme, and common readings.
Structured Group Learning Experiences

The Center’s Promising Practices initiative describes five of the promising practices — orientation, accelerated or fast-track developmental education, first-year experience, student success course, and learning community — as structured group learning experiences.

Typically, these practices reflect the goal of ensuring that students are successful in the early weeks and then through the first year of college. They can occur at different points in students’ entering experiences and extend over differing time periods.

An important step for community colleges is to better understand and describe these practices.

College Responses

CCIS participants (N=288) use a variety of approaches to reach their students, and most report using multiple structured group learning experiences: 30% report using three, 27% report using four, and 19% report using all five.

Which Structured Group Learning Experiences Are Colleges Using?

Of the five structured group learning experiences, orientation is the most commonly used among CCIS respondents; accelerated or fast-track developmental education is used least.

Percentage of colleges that report they implement each practice (N=288)

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<tr>
<th>Practice</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Orientation</td>
<td>96%</td>
</tr>
<tr>
<td>Accelerated or fast-track developmental education</td>
<td>42%</td>
</tr>
<tr>
<td>First-year experience</td>
<td>58%</td>
</tr>
<tr>
<td>Student success course</td>
<td>83%</td>
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<tr>
<td>Learning community</td>
<td>56%</td>
</tr>
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Source: 2011 CCIS data.

Do Colleges Make these Practices Mandatory?

Among responding colleges using each practice, the percentage that require the experience for all first-time students (part-time and full-time)

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<tr>
<th>Practice</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Orientation</td>
<td>Yes (38%)</td>
</tr>
<tr>
<td>Accelerated or fast-track developmental education</td>
<td>Yes (13%)</td>
</tr>
<tr>
<td>First-year experience</td>
<td>Yes (27%)</td>
</tr>
<tr>
<td>Student success course</td>
<td>Yes (15%)</td>
</tr>
<tr>
<td>Learning community</td>
<td>Yes (1%)</td>
</tr>
</tbody>
</table>

*Required for first-time developmental students only (part-time and full-time)

Source: 2011 CCIS data.

How Do Colleges Evaluate the Success of Structured Group Learning Experiences?

CCIS gave colleges a list of 11 types of data and asked the colleges to indicate which types of data they use to evaluate program effectiveness. The most common data types used across all promising practices were overall course completion rates, fall-to-spring retention, and fall-to-fall retention.

Source: 2011 CCIS data.
### Student Responses

**Students’ Participation in Structured Group Learning Experiences**

Percentage of CCSSE respondents who report engaging in each experience

- Participating in orientation: 58% (N=237,325)
- Participating in accelerated or fast-track developmental education programs*: 26% (N=64,658)
- Participating in a first-year experience program: 26% (N=230,996)
- Enrolling in a student success course: 24% (N=229,696)
- Enrolling in an organized learning community: 13% (N=229,374)

*Developmental education students only

### Faculty Responses

**Full-Time Faculty Members Are More Likely than Part-Time Faculty to Be Involved with Structured Group Learning Experiences**

<table>
<thead>
<tr>
<th>Practice</th>
<th>Full-time (N=10,972)</th>
<th>Part-time (N=11,645)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Orientation</td>
<td>13%</td>
<td>6%</td>
</tr>
<tr>
<td>Accelerated or fast-track developmental education</td>
<td>14%</td>
<td>8%</td>
</tr>
<tr>
<td>First-year experience</td>
<td>17%</td>
<td>11%</td>
</tr>
<tr>
<td>Student success course</td>
<td>12%</td>
<td>11%</td>
</tr>
<tr>
<td>Learning community</td>
<td>16%</td>
<td>8%</td>
</tr>
</tbody>
</table>


---

"Without taking [developmental education], you can’t even get to the college courses. I’ll probably be in school here three or four years before I get to my nursing program.”

— Student

"I like having classes that are linked. [Even if] you're moving across the campus for your next class, you work with the same people.”

— Student

Components of Structured Group Learning Experiences

**College Responses**
CCIS asks colleges about the components they include in each structured group learning experience. The five most frequently reported components for each structured group learning experience are displayed below.

### Orientation
Among 276 colleges reporting they have one or more programs

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information about and/or use of the college’s personal/social support services</td>
<td>71%</td>
</tr>
<tr>
<td>Information about and/or use of the college’s academic support network</td>
<td>68%</td>
</tr>
<tr>
<td>Use of information resources (e.g., library, finding and evaluating sources)</td>
<td>50%</td>
</tr>
<tr>
<td>Time-management skills</td>
<td>46%</td>
</tr>
<tr>
<td>Tutoring</td>
<td>38%</td>
</tr>
</tbody>
</table>

### Accelerated or Fast-Track Developmental Education
Among 120 colleges reporting they have one or more programs

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tutoring</td>
<td>54%</td>
</tr>
<tr>
<td>Information about and/or use of the college’s academic support network</td>
<td>43%</td>
</tr>
<tr>
<td>Basic technology skills (e.g., using the Internet, word processing)</td>
<td>37%</td>
</tr>
<tr>
<td>Study skills</td>
<td>33%</td>
</tr>
<tr>
<td>Assigned group projects/assignments</td>
<td>33%</td>
</tr>
</tbody>
</table>

### First-Year Experience
Among 166 colleges reporting they have one or more programs

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time-management skills</td>
<td>72%</td>
</tr>
<tr>
<td>Information about and/or use of the college’s academic support network</td>
<td>72%</td>
</tr>
<tr>
<td>Information about and/or use of the college’s personal/social support services</td>
<td>70%</td>
</tr>
<tr>
<td>Study skills</td>
<td>70%</td>
</tr>
<tr>
<td>Use of information resources (e.g., library, finding and evaluating sources)</td>
<td>67%</td>
</tr>
</tbody>
</table>

### Student Success Course
Among 238 colleges reporting they have one or more courses

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Study skills</td>
<td>90%</td>
</tr>
<tr>
<td>Time-management skills</td>
<td>88%</td>
</tr>
<tr>
<td>Note-taking skills</td>
<td>88%</td>
</tr>
<tr>
<td>Test-taking skills</td>
<td>85%</td>
</tr>
<tr>
<td>Use of information resources (e.g., library, finding and evaluating sources)</td>
<td>81%</td>
</tr>
</tbody>
</table>

### Learning Community
Among 160 colleges reporting they have one or more programs

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use of information resources (e.g., library, finding and evaluating sources)</td>
<td>59%</td>
</tr>
<tr>
<td>Study/assignments focused on a common theme</td>
<td>57%</td>
</tr>
<tr>
<td>Common reading(s)</td>
<td>56%</td>
</tr>
<tr>
<td>Information about and/or use of the college’s academic support network</td>
<td>54%</td>
</tr>
<tr>
<td>Assigned group projects/assignments</td>
<td>53%</td>
</tr>
</tbody>
</table>

Source: 2011 CCIS data.
Sustaining Success

Class Attendance

“When I miss class, my English teacher e-mails me and says what we need to do for the next class.”
— Student

Attending class is a key element of succeeding in college, and emerging evidence suggests that class attendance policies have value. For example, researchers have found that students’ class attendance is the best predictor of academic performance in college — it more reliably predicts college grades than do high school GPA, SAT scores and other standardized admissions tests, study habits, and study skills.10 However, more research is needed to explore the effects of attendance policies at community colleges. Seventy-seven percent of SENSE Promising Practices respondents (26,401 of 34,072) report that all of their instructors explained a class attendance policy, while only 3% (1,042 of 34,072) indicate that none of their instructors did so. Moreover, about a quarter of SENSE respondents (19,033 of 73,649) say they skipped class at least once in the first three weeks of their first term.

“They don’t really care if you miss class because that’s your fault.”
— Student

Class Attendance: Faculty Policies and Student Actions

Most Students Report that Instructors Have Attendance Policies

During the current semester/quarter at this college, my instructors clearly explained a class attendance policy that specified how many classes I could miss without penalty.

- All of my instructors explained a class attendance policy: 75% (N=132,279)
- Not all of my instructors explained a class attendance policy: 25% (N=34,072)

Students Skip Class

In your experiences at this college during the current school year, about how often have you skipped class? (N=440,980)

- Never: 53%
- Sometimes: 42%
- Often: 4%
- Very often: 2%

During the first three weeks of your first semester/quarter at this college, about how often did you skip class? (N=73,649)

- Never: 74%
- Once: 18%
- Two or three times: 7%
- Four or more times: 1%

Percentages do not total 100% due to rounding.

Source: 2010 SENSE Cohort data (entering students).
Class Attendance: Faculty Policies and Actions

Faculty Responses

Attendance Policies
For your selected course section, do you have a course attendance policy that specifies the adverse impact on students’ grades for missing class? (N=20,478)

![Pie chart showing 78% of respondents saying yes.]

How Class Attendance Policies Affect Grades
What is the nature of the adverse impact on students’ grades for missing class (not assignment deadlines) in your selected course section? (N=15,984)

Percentage responding yes
- Attendance is tied to a participation score or grade: 63%
- I deduct a given number of points from the final grade for each missed class: 13%
- I deduct a given number of points after a preset number of classes have been missed: 18%

Respondents can choose more than one response.
Source: 2011 CCFSSE Promising Practices data.

Alert and Intervention

“She said, ‘I’m not going to be able to help you individually because I’m so busy.’ I thought, ‘Okay, I’ll just look at it until I understand what’s going on here.’”
— Student

Early academic warning processes typically are triggered when faculty members identify students who are struggling and notify others in the college who step in to support the students. Colleges might follow up with students by e-mail, text, social media, or telephone and encourage them to access services, such as tutoring, peer mentoring, study groups, and student success skills workshops.

Some research suggests that when colleges make students aware of their academic difficulties, students are more likely to successfully complete the course in question and to persist over the long term.11

Only 14% of CCSSE Promising Practices respondents (17,654 of 127,770) say that they have experienced academic difficulties and been contacted by someone at the college, while 27% of faculty (6,186 of 22,617) say that when students are struggling in their classes, they notify someone else in the college who is part of a systematic early warning system. Faculty may also contact students directly: 67% of faculty (15,113 of 22,617) say that when students are struggling in their classes, they contact the students outside of class, while 63% (14,269 of 22,617) say they communicate with students directly during class.

“I just don’t want to tell him, ‘I don’t know how to do this. I need help.’”
— Student
Alert and Intervention: Reaching Out to Struggling Students

**Student Responses**

**Most Students Have Not Been Contacted by Their Colleges**

Someone at this college contacts me if I am struggling with my studies to help me get the assistance I need *(N=127,770)*

- **Yes** 14%
- **No** 52%
- **Not applicable; I have not experienced academic difficulties** 34%


Someone at this college contacts me if I am struggling with my studies to help me get the assistance I need *(N=32,750)*

- **Yes** 14%
- **No** 50%
- **Not applicable; I have not experienced academic difficulties** 35%

Percentages do not total 100% due to rounding.


**College Responses**

**Most Colleges Report Having Alert and Intervention Processes**

Has your institution implemented a systematic early academic warning/early intervention process? *(N=181)*

- **Yes** 77%

Source: 2011 CCIS data.

“I was having a difficult time completing an assignment, so I just e-mailed her, and we ended up talking on the phone, and she helped me through it.” — Student

**Faculty Responses**

**Most Faculty Report Contacting Students Directly**

Which of the following statements describe actions you have taken in regard to students who have been struggling academically during the current semester/quarter in your selected course section? *(N=22,617)*

Percentage replying **yes**

- I’ve communicated with students directly during class 63%
- I’ve contacted students directly outside of class 67%
- I’ve notified someone else in the college who contacts students as part of a systematic early warning system 27%
- I’ve contacted someone else in the college who then contacts students as part of an informal intervention process 11%
- I have referred students to college tutoring services 52%
- I have required that students participate in college tutoring services 5%
- Other 8%

Respondents can choose more than one response.

Source: 2011 CCFSSE Promising Practices data.
Experiential Learning beyond the Classroom

Experiential (hands-on) learning, such as internships, co-op experience, apprenticeships, field experience, clinical assignments, and community-based projects, has multiple benefits. It steeps students in content, and it encourages students to make connections and forge relationships that can support them throughout college and beyond.

More than three-quarters of CCSSE respondents (77%, 338,987 of 438,716) say they have not participated in a community-based project as part of a course. Thirteen percent of faculty (2,653 of 20,301) report requiring students to be involved in an internship or other hands-on-learning experience. In turn, 15% of students (65,901 of 433,341) say they have had such experiences as part of coursework.

Forty-five percent of students (194,590 of 433,341) express interest in having these experiences by noting that they plan to undertake them. Realizing these plans, however, might not be possible given available college resources and offerings.

“I’m in radiology, and now I’m at the hospital three days a week, working like a regular employee. It’s unbelievable that about a year ago, coming out of high school, I didn’t know any of that.”

— Student

Experiential Learning

Student Responses

Few Students Participate in Experiential Learning

In your experiences at this college during the current school year, about how often have you participated in a community-based project as part of a regular course? (N=438,716)

- Never: 77%
- Sometimes: 15%
- Occasionally: 45%
- Frequently: 40%
- Very often: 3%
- Don’t know: 28%

Source: 2011 CCSSE Cohort data.

Faculty Responses

Most Faculty Don’t Require Hands-On Learning

How often do students in your selected course section participate in a community-based project as part of a regular course? (N=36,793)

- Never: 50%
- Sometimes: 15%
- Occasionally: 13%
- Frequently: 4%
- Very often: 3%
- Don’t know: 28%

Source: 2011 CCFSE Cohort data.

In your selected course section, do you require students to be involved in an internship, apprenticeship, clinical placement, or other hands-on-learning experience beyond the classroom? (N=20,301)

- Yes: 13%
- No: 87%

**Tutoring**

“Tutors walk you through your problem, and they don’t make you feel stupid if you don’t understand something.”

— Student

Studies suggest that participation in tutoring is associated with higher GPAs and pass rates. For many colleges, the good news is that tutoring can be offered in multiple ways and provide a range of benefits in terms of student engagement. For example, group tutoring can build relationships among students; one-on-one tutoring often serves both tutor and tutee; and technology-enhanced tutoring can maximize resources by focusing assistance where it’s needed while helping to build students’ engagement with the subject matter itself.

Even though 73% of CCSSE respondents (N=403,333) indicate that tutoring is somewhat or very important and 80% of CCFSSE respondents (N=35,299) report sometimes or often referring students to tutoring, only about one-quarter of students (N=130,147) report ever participating in tutoring.

“My grades are good because I go [to the tutoring center] whenever I have free time.”

— Student

**Tutoring Referral and Use**

**Student Responses**

**Few Students Participate in Tutoring**

During the current academic year, I participated in tutoring provided by this college (N=130,147)

- Never: 76%
- Less than 1 time a week: 12%
- 1 to 2 times a week: 9%
- 3 to 4 times a week: 3%
- More than 4 times a week: 1%

**Faculty Responses**

**Most Faculty Report Referring Students to Tutoring**

How often do you refer students to peer or other tutoring? (N=35,299)

- Don’t know/NA: 3%
- Rarely or never: 17%
- Sometimes: 42%
- Often: 38%

Source: 2011 CCFSSE Cohort data.

**Supplemental Instruction**

“Anybody can come to [supplemental instruction]. You go over material that’s been discussed in class. I got to meet great people, and we formed our own study group to help even more. It really saved me big time.”

— Student

While tutoring usually is conducted one-on-one, supplemental instruction typically involves a regularly scheduled, supplemental class for a portion of students enrolled in a larger course section. Supplemental instruction may be taught by the class instructor or a trained assistant, often a former student who was successful in the class.

Supplemental instruction, like tutoring, may increase the impact of classroom instruction by providing extra time for skill practice. Studies indicate that students participating in supplemental instruction earn higher grades than their peers who did not participate.

Students’ actions with regard to tutoring and supplemental instruction tend to be responsive to requirements. Among faculty who say supplemental instruction is available in their classes (N=8,802), 19% require supplemental instruction for all or some students, while 81% make participation optional for all students. Student responses (N=130,118) show that 18% of students participated in some supplemental instruction, while 82% never did so.
Supplemental Instruction

Student Responses

Few Students Participate in Supplemental Instruction
During the current academic year at this college, I participated in supplemental instruction (N=130,118)

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never</td>
<td>82%</td>
</tr>
<tr>
<td>Less than 1 time a week</td>
<td>10%</td>
</tr>
<tr>
<td>1 to 2 times a week</td>
<td>5%</td>
</tr>
<tr>
<td>3 to 4 times a week</td>
<td>2%</td>
</tr>
<tr>
<td>More than 4 times a week</td>
<td>1%</td>
</tr>
</tbody>
</table>


Faculty Responses

Few Faculty Require Supplemental Instruction
In your selected course section, is supplemental instruction available to students? (N=20,302)

<table>
<thead>
<tr>
<th>Option</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>44%</td>
</tr>
<tr>
<td>No</td>
<td>56%</td>
</tr>
</tbody>
</table>

Source: 2011 CCFSSE Promising Practices data.

College Responses

Most Colleges Report Offering, but Not Requiring, Supplemental Instruction
Colleges that report offering supplemental instruction in any classes

<table>
<thead>
<tr>
<th>Option</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>87%</td>
</tr>
</tbody>
</table>

(N=167)

Source: 2011 CCS data.

Among colleges that offer supplemental instruction, the percentage that require it

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mandatory</td>
<td>1%</td>
</tr>
<tr>
<td>Optional</td>
<td>99%</td>
</tr>
</tbody>
</table>

(N=167)

Source: 2011 CCS data.

During the first three weeks of your first semester/quarter at this college, about how often did you participate in supplemental instruction? (N=73,728)

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never</td>
<td>69%</td>
</tr>
<tr>
<td>Once</td>
<td>15%</td>
</tr>
<tr>
<td>2 or 3 times</td>
<td>11%</td>
</tr>
<tr>
<td>4 or more times</td>
<td>5%</td>
</tr>
</tbody>
</table>

Source: 2010 SENSE Cohort data (entering students).

Among faculty who replied yes to the question at the left: In your selected course section, do you require students to be involved in supplemental instruction? (N=8,802)

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>81%</td>
</tr>
<tr>
<td>No</td>
<td>19%</td>
</tr>
</tbody>
</table>

Yes, for all students

Yes, for some students, depending on academic performance

Source: 2011 CCFSSE Promising Practices data.

Source: 2011 CCIS data.
Many colleges are implementing one or more promising practices — and seeing dramatic gains in student retention and success.

**Student Success Course**

In fall 2007, Brazosport College (TX) began requiring all first-time-in-college students to take Learning Frameworks, a student success course that focuses on developing academic and personal skills, enhancing study skills, and helping students set goals. Students in the 2007–2009 cohorts who successfully completed the course had an average fall-to-spring retention rate of 89%, compared to a baseline of 66%; they successfully completed transitional reading at rates of 90% to 97%, compared to a baseline of 66%; and they successfully completed transitional writing at rates of 77% to 95%, compared to a baseline of 72%. In addition, 78% of Learning Frameworks students in the 2009 cohort successfully completed pre-algebra, compared to a baseline of 57%. Students who successfully completed Learning Frameworks, moreover, were more likely to succeed in developmental coursework, more likely to succeed in gatekeeper courses, more likely to be retained, and less likely to withdraw.

**Academic Planning**

The GPS LifePlan (Goals+Plans = Success) at Century College (MN) helps students make intentional connections with the college and gives them tools for success. The GPS website has links to resources that help students develop goals and plans related to career, education, finance, leadership, and personal development, and it helps students maintain an eFolio (electronic portfolio) to track and reflect on activities completed.

GPS is integrated into the college curriculum through the college’s New Student Seminar as well as developmental reading courses, learning communities, and other classes. More than 100 faculty members have incorporated GPS in more than 40 courses throughout the campus.

An independent evaluation of GPS found that first-time entering students’ fall-to-fall persistence increased from 60% to 64% after the first full year of GPS LifePlan implementation. New full-time cohorts of students using GPS had fall-to-spring retention rates of 81%, compared to overall fall-to-spring retention of 72%. The evaluation, which also showed a high level of awareness and use among faculty and students, included data analysis; focus groups with faculty, students, and staff; and individual interviews with every member of the campus leadership team.

**Registration, Academic Planning, and Orientation**

Analysis of CCSSE and SENSE results — and significant input from faculty — led Chipola College (FL) to implement five policy changes: (1) abolishing late registration so students are not programmed to fail before they begin; (2) scheduling a mandatory 45–60 minutes for entering students’ initial advising sessions; (3) allowing students to register earlier to assist in planning for family and work commitments; (4) offering orientation taught by faculty during the summer before the fall semester starts; and (5) renaming Curriculum Guides to Academic Plans so students will recognize them as clearly laid out plans leading to graduation.

Also, over a five-year period, the college offered five one-day mandatory faculty workshops and three optional paid summer institutes for full-time and adjunct instructors. During these workshops and institutes, faculty became increasingly focused on promoting student persistence.

Between 2005 and 2009, the time period when the college implemented these measures, the college’s performance on two CCSSE benchmarks, student-faculty interaction and support for learners, increased sharply. Over the same time period, CCSSE data on individual survey items also showed an increase in students’ perceptions that they received the support they needed to help them succeed. Finally, three-year graduation rates of associate degree-seeking students improved. For example, 24% of associate degree-seeking students who started in fall 2002 graduated in three years, compared to 31% of such students who entered in fall 2006.

**First-Year Experience**

The College of the Sequoias (CA) has a long history of serving first-generation, low-income Hispanic students. The college’s First-Year Experience (FYE) program is the umbrella of student support that includes intrusive counseling, peer mentoring, learning communities, and augmented instruction. Augmented instruction, a mandatory component of the FYE math course, adds an additional two hours of math with the instructor and tutor each week. All instructors in the FYE math and English programs are full-time faculty.

From fall 2009 to fall 2010, FYE developmental math students who received augmented instruction had a 6% increase in success compared to no improvement for FYE developmental math students who did not receive augmented instruction. Success is defined as passing with a C or higher.
In the same time period, FYE students’ success rates in developmental English (two levels below college-level) increased from 57% in fall 2009 to 63% in fall 2010, as compared with an increase from 49% in fall 2009 to 59% in fall 2010 for all new students.

Retention rates for developmental English students participating in the FYE rose from 90% in fall 2009 to 92% in fall 2010, as compared with a steady 87% retention rate for non-FYE students.

In addition, pilot data on the college’s innovative augmented instruction model indicate up to 20% improvement in course success rates and 10% improvement in retention rates for FYE students compared to the general new student population.

**Required Orientation and College Success Course**

In 2006, Durham Technical Community College (NC) took multiple steps to improve its 69% first-to-second-semester retention rate. The college began to require all first-time-in-college students — full-time and part-time students with fewer than 12 successful college credit hours — to attend a pre-enrollment orientation and to enroll in a college success course. The two experiences help new students understand enrollment and other college processes, manage the college’s online systems, develop skills, explore career choices, draft a specific degree-completion plan, connect with campus resources, and build relationships.

The college now has data for four cohorts (2007–2010), and persistence has improved each year. The 2007 cohort’s first-to-second semester persistence rate was 73%. Nearly nine in 10 students in the 2010 cohort (89%) persisted into the second semester.

The college plans to continue these interventions and to add others, such as required placement testing preparation and automated registration to ensure correct course placement, to improve entering students’ experiences.

**Early Assessment**

In fall 2008, Howard Community College (MD) launched a partnership with the Howard County Public School System to assess 11th graders and better prepare them for college. The program began with administering reading and writing placement tests for all 11th grade students, except those enrolled in honors, Advanced Placement, or gifted and talented courses. These students also met with their high school guidance counselors and the college’s English faculty to discuss college readiness in conjunction with grades and overall high school performance.

After the testing, the county’s public school system used the college’s developmental curriculum to infuse developmental objectives into its classes. Thus, students who were not college ready (per their test scores) were given the opportunity to become ready during their senior year. High schools also added a senior-year writing project and an oral presentation to their curriculum.

Two years after the program began, students who went from the public school system to the college had an 80% fall-to-spring retention rate, as compared with 56% for all first-time freshmen. In addition, 40% placed into both college-level reading and writing, as compared with 36% for all first-time freshmen, and 73% improved their scores, compared to results from the test they took in high school.

**Developmental Education Completion**

After reviewing CCSSE and SENSE data and conducting student focus groups, Lee College (TX) determined that better student engagement was critical to improve completion rates in developmental education. The college adopted a three-pronged approach that centered on redesigning courses, improving faculty development, and expanding student support services.

The college’s specific strategies included (1) requiring a learning strategies course for all new students whose placement scores indicate a need for two or more areas or levels of remediation; (2) offering fast-track remedial courses in reading, writing, and math; (3) eliminating late registration so faculty can implement first-week engagement activities in their courses; (4) requiring orientation for all students new to the college; and (5) requiring financial aid orientation for all students eligible to receive federal assistance.

In addition, faculty participated in professional development including student success strategies workshops. Faculty, staff, and administrators participated in the Center’s Entering Student Success Institutes in 2008 and 2011.

To improve student support, a counselor is dedicated to developmental education, and her office is located in the center of the building where students take developmental education classes. She visits with each developmental class, and students are required to make contact with her each semester.

Between 2006 and 2011, developmental success rates in 16-week courses increased from 44% to 59% in fundamentals of writing, 42% to 50% in intermediate algebra, and 67% to 70% in advanced college reading skills. Fast-track developmental courses have shown consistently higher success rates in math and reading, while results were mixed in writing.

Moreover, from 2003 to 2007, the percentage of students completing degrees and certificates within three years increased for all students (from 11% to 19%) as well as among African Americans (10% to 13%), men (13% to 17%), and 18- to 25-year-olds (11% to 16%).

**Scaling Up a New Instructional Approach**

When Montgomery County Community College (PA) wanted to improve success rates for students placing into developmental math, the college redesigned its instructional approach. The college maintained two levels of developmental math (a basic arithmetic-review level and a college-preparatory-math level) but changed the curriculum and teaching style for both. The newly designed curriculum uses a conceptual approach and centers on creating active learners. For example, rather than the traditional means of teaching arithmetic — presenting definitions, providing examples, and doing practice problems — instructors ask students to figure out the process for solving problems. This approach makes students active participants in their own education and better engages them.
In fall 2008, the college piloted the new approach in the basic arithmetic course with 19 students, and 74% completed the course with a C or better, compared with just 45% of similar students in traditional developmental math. In spring and fall 2009, the college continued with one pilot class each semester at the basic arithmetic level, and students in these pilot classes had higher success rates than their peers. In spring 2009, 63% of students in the pilot passed with a C or higher compared with 34% of students in traditional developmental math. In fall 2009, 68% of pilot students succeeded, compared with 44% of their peers.

In spring and fall 2009, instead of placing all students with an Accuplacer score of 20–74 in the basic arithmetic class, the college decided to place students who had a score of 65–74 in the newly designed college-preparatory developmental math course. The new course combined basic arithmetic review with college-preparatory developmental math. The college recorded higher success rates for students in this class than for students in traditional college-preparatory developmental math.

Based on these promising results, MCCC trained additional faculty in the new approach and continued to make changes based on data. In spring 2010, the college enrolled half of all students placing in the basic arithmetic developmental math course in the redesigned classes.

In fall 2010, the college again expanded the scale of the developmental math program by further lowering the cut scores: All students scoring 55–74 on their math placement tests were placed in the newly designed college-preparatory developmental math course. The new course combined basic arithmetic review with college-preparatory developmental math. Even with this lower cut score, students in the redesigned college-preparatory class had a 58% success rate (N=380), compared with a 40% success rate (N=284) for students in traditional developmental math. With these results, starting in fall 2011, all basic arithmetic classes began using the new approach, and all students scoring 55–74 on their placement tests are enrolled in the redesigned college-preparatory math course.

**Professional Development for Adjunct Faculty**

Faculty at Sinclair Community College (OH) created an Adjunct Faculty Certification Course, which helps adjunct instructors learn and practice effective teaching methods. Participants also can accelerate their progress from Lecturer I to Lecturer II (and to higher pay) if they demonstrate competency in five key areas.

The course gives adjunct faculty a toolbox of presentation techniques, active learning strategies, knowledge of the campus and student support systems, and knowledge of FERPA and other policies. It also includes peer reviews of their classroom performance and mentoring from other faculty members. The course is given in five sessions: The First Day of Class, FERPA/Ethical and Legal Issues, Active Learning and Critical Thinking, Presentation Techniques, and Student Support Services.

The certification course has been positively received by department chairs and adjunct faculty alike. Since the course teaches about pedagogy, it offers crucial support to a majority of the college’s instructors, and it frees up the department chairs for other duties. Adjunct faculty are requesting additional sections of the course, and the college is developing a new advanced track so professional development can continue.

It is too early to evaluate results, but the college expects that having better-prepared part-time faculty will improve student success.

**Centralized Academic and Technical Support with Faculty Engagement**

The William J. Law Jr. Learning Commons at Tallahassee Community College (FL) centralizes learning and technology support and provides resources for all students across the curriculum. Students taking classes from developmental studies through sophomore courses receive individual and small-group tutoring in a broad range of subject areas, technology instruction, assistance with research and information literacy, and counseling. They have access to technology, group study spaces, and a wide range of print and online resources.

Faculty engagement is key to the program’s success. Many faculty members have scheduled office hours in the Learning Commons and provide professional support for students and learning specialists. Faculty and staff collaborate to help students master content, develop effective learning strategies, strengthen their technology skills, and use resources. In addition, counseling staff, learning specialists, and faculty collaborate to develop Academic Success Plans for students with academic challenges.

The Learning Commons provided a dramatic change in student support at Tallahassee. Before it opened, learning support was fragmented and accessed by a small percentage of students. In its first three years, the number of individual students served grew from 7,200 students in fall 2008 to 11,300 students in fall 2010. During that same period, the number of unique courses served increased, as did the number of logged individual visits. As important, the percentage of full-time faculty with scheduled time in the Learning Commons increased from 15% in 2008 to nearly 40% in 2010.

Students who use the Learning Commons are more successful in their courses and persist at higher rates than students who don’t use it. Among students taking the college’s 20 classes with the highest enrollment, students who used the resources four or more times had a 9% higher success rate in fall 2010 and a 17% higher success rate in spring 2011. Differences for developmental students were even more dramatic. The number of students successfully completing classes increased 25% in fall 2010 and 35% in spring 2011. Success is defined as passing with a C or higher.
Retention rates also are higher among students who regularly use the Learning Commons. In the fall 2008 cohort, fall-to-spring retention was 9% higher among students who visited the Learning Commons four or more times and 8% higher among students who had one to three visits than among students who never visited. Fall-to-fall retention for fall 2009 was 29% higher for students who used the resources four or more times, and 27% higher for those using the resources one or more times.

Graduation rates for the first-time-in-college fall 2008 cohort (N=2,415) also show a positive effect related to participating in the Learning Commons. The three-year graduation rate for students using the resources of the Learning Commons was 41%, compared to 7% for students who never used the resources.

Centralized Academic Support

West Kentucky Community and Technical College (KY) replaced its tutoring center with an Academic Support Center to better meet the needs of the college’s growing number of underprepared and at-risk students. The new center provides supplemental instruction and trains its tutors with consistent guidelines. Students are encouraged to study at the center, schedule appointments for tutoring, and attend sessions that address test anxiety, organizational skills, note taking, and other issues.

Since the opening of the Academic Support Center, the college has had a 10% increase in retention during a period of steady growth in its student population. The Academic Support Center is working with 1,000 of the college’s nearly 4,000 credential-seeking students. In fall 2010, the college evaluated its tutoring services by comparing the performance of students tutored in the Academic Support Center with that of students in the same course sections (students who received the same classroom instruction but did not receive tutoring). The results: 60% of the students who received tutoring successfully completed their courses, compared with 54% of their peers who did not receive tutoring.

Registration and Orientation

In fall 2009, York Technical College (SC) ended its practice of late registration and began requiring students to register for credit courses prior to the first class meeting. Before this change, students could register for credit courses until the last day of the first week of classes. To accommodate students who do not register on time, the college now offers some of its more popular courses in eight- and 12-week mini-courses that begin later in the semester. The college credits the new registration policy — and its fall 2010 mandate for all credit-seeking students to attend orientation — with its increased scores on all SENSE benchmarks.

In addition, in fall 2011, the college required all entering credit students to attend an orientation session. Then, after meeting with a college admissions counselor, students were invited to attend an orientation session specific to the department of their program of study. These sessions helped entering students understand the requirements of their programs and gave them opportunities to interact with their advisors, faculty, and fellow students.

With these strategies in place, the college scored 63 (relative to a standardized national average of 50) on the early connections SENSE benchmark. Students’ responses to individual SENSE survey items support the conclusion that these practices have a positive effect on early student engagement. For example, the percentage of students who agree or strongly agree that they were assigned a specific person to see for information increased from 41% to 55%. In addition, the percentage of students who report that they never worked with other students on a project during class decreased from 27% to 17%.

Intrusive Advising for At-Risk Students

Zane State College (OH) introduced intrusive advising to boost fall-to-fall retention among at-risk and underprepared students. The college chose to focus on these students because of data indicating that students who successfully complete their first year, even developmental education students, have a nearly 90% likelihood of graduating on time (within three years).

The college’s intensive advising efforts, all designed to foster personal connections with students, included personal phone calls, mandatory meetings, e-mails, and Facebook postings. The ongoing interaction allowed advisors to redirect course registrations when needed and remind students of peer and professional tutoring, writing workshops, and other services. At the same time, the college introduced mandatory assessment and placement, mandatory orientation, and a mandatory first-year experience course.

These efforts have resulted in increased retention of at-risk students as well as higher completion rates for developmental education courses. For example, in 2006, first-to-second-term retention among at-risk students was 77%. In 2009, that figure rose to 82%. In addition, fall-to-fall retention of those students deemed most at risk has increased by 10%–16% over the 2006 baseline, with the 2008 and 2009 cohorts persisting at rates equal to or better than their less at-risk peers. Overall, Zane State’s year-to-year retention has improved by 6%.

Developmental education students showed pronounced improvements in all subject areas. In 2004, 44% of students completed their developmental English sequences in their first year, compared with 67% who did so in 2009. In the same time period, developmental math completion rates rose from 14% to 35%, and developmental reading completion rates rose from 46% to 59%.
Next Steps for the Center and Colleges

Next Steps for the Center

The initiative — Identifying and Promoting High-Impact Educational Practices in Community Colleges — is ongoing. CCIS will be administered again in 2012, and all community colleges are invited to participate. In addition, the special-focus items about promising practices will again be included in CCSSE, CCFSSE, and SENSE administrations. The next phase of Promising Practices data analysis will explore the relationship between student participation in the practices and (1) the CCSSE and SENSE benchmarks; (2) individual CCSSE and SENSE student engagement items; (3) self-reported student outcome measures from CCSSE and SENSE; and (4) matched student-record outcome data, such as grades, retention, course completion, and graduation. This research will be presented in a subsequent report to be published in 2013.

“All these experiences require resources that most of our institutions don’t have. We need to re-channel, stop doing some of the things we are doing now that aren’t working well. It is easy to say, but hard to do.”

— George Kuh
Chairman’s Professor Emeritus
Indiana University, Bloomington

Next Steps for Colleges

Colleges have a growing body of evidence about what works, and they may have to look at things in new ways to make changes that are critical for success. There are no easy answers and no silver bullets. Real solutions only come with honest, unflinching evaluation of programs and practices — and a commitment to focus resources on efforts that are part of coherent educational pathways for students.

Using this report as a guide, colleges can evaluate their own use of promising practices. The recommendations below can guide discussions among administrators, faculty, staff, and students.

Look for Incongruities

Look for incongruities in the data presented in this report and determine if these (or others) apply to your college. Use that information to prompt courageous conversations about what outcomes are most important to your college — and what changes will result in them. For example:

- **Can more students test out of developmental education?** 74% of students report that they were required to take a placement test, but only 28% say they used materials provided by the college to prepare for those tests. Smaller percentages report participating in an intensive skills brush-up experience. At the same time, 44% of colleges report offering some sort of test preparation, but only 13% make test preparation mandatory.

- **Are students getting the academic support they need?** 72% of students who took a placement test report that they needed developmental education, but 82% of students say they never participated in supplemental instruction and 76% say they never participated in tutoring. At the same time, 87% of colleges report that they offer supplemental instruction, but only 14% make it mandatory for developmental education students.

- **Does academic planning set students up for success?** 42% of part-time students and 19% of full-time students work more than 30 hours per week. More than half care for dependents. But only 26% of entering students say a staff member talked with them about their commitments outside of class to help them figure out how many courses to take.

Evaluate Current and New Programs

- Inventory current practices. What practices does the college use? What do data reveal about their effectiveness? At what level of scale are they implemented? For what target student populations?

- Disaggregate the data and determine how effectively college programs are serving different student groups, paying close attention to underprepared students and students who are traditionally underserved.

- Choose what to care about and then how to leverage resources. If everything is a priority, then nothing of significance gets done. Given limited resources, colleges must identify the intentionally designed experiences that will have the largest possible positive impact on the largest possible number of students.

- Using evidence, identify programs that should be scaled up and programs that should be modified or discontinued. How can resources be reallocated to strategies that hold greater promise?

- Think about how multiple practices can reinforce one another. In most cases, multiple practices must work in concert to generate significant change.

- Make the most of finite opportunities to engage students. For each course, colleges and faculty typically have about three hours per week with their students. What is the best way to capitalize on that time?

Resources for Colleges

A growing collection of resources created by the Center can help colleges in their work to continuously strengthen student engagement.

The Center works in partnership with member colleges through a combination of local, state, and national institutes; conference presentations; publications; webinars; and other online tools. Always, the goal is to help practitioners understand their data and use those data to make informed decisions about how best to redesign and improve students’ educational experiences.

The Center provides a variety of resources through its website, including communication tools, accreditation tools that map Center survey items to regional accreditation standards, and focus group tools.
Overview of the Respondents

The 2011 CCSSE and CCFSSE Cohorts

Each year, CCSSE is administered in the spring during class sessions at CCSSE member colleges. All institutions that participated in the CCSSE administration are invited to participate in CCFSSE, which is administered online. At colleges that choose to participate in CCFSSE, every faculty member teaching credit classes in the spring term is eligible to respond to the survey.

CCSSE and CCFSSE data analyses from the main survey use a three-year cohort of participating colleges. Using a three-year cohort increases the number of institutions, students, and faculty in the national data set; optimizes representation of institutions by size and location; and therefore, increases the stability of the overall results. The 2011 CCSSE Cohort and the 2011 CCFSSE Cohort include all colleges that participated in CCSSE and CCFSSE from 2009 through 2011.

- Nearly 444,000 students from 699 institutions in 48 states and the District of Columbia, five Canadian provinces (Alberta, British Columbia, Nova Scotia, Ontario, and Quebec), Bermuda, and the Northern Marianas are included in the 2011 CCSSE Cohort.
- 2011 CCSSE Cohort member colleges in the United States enroll a total of 5,109,690 credit students — approximately 67% of the total credit-student population in the nation's community colleges.
- Of the 699 participating colleges, 313 (45%) are classified as small (up to 4,499 students), 185 (26%) as medium (4,500–7,999 students), 125 (18%) as large (8,000–14,999 students), and 76 (11%) as extra large (15,000 or more students). Nationally, 48% of community colleges are small, 23% are medium, 18% are large, and 12% are extra large.
- According to the Carnegie Classifications, the 2011 CCSSE Cohort includes 149 (21%) urban-serving colleges, 149 (21%) suburban-serving colleges, and 401 (57%) rural-serving colleges. Fall 2009 data indicate that among all U.S. community colleges, 18% are urban, 20% are suburban, and 62% are rural.
- 2011 CCSSE Cohort respondents generally reflect the underlying student population of the participating colleges in terms of gender and race/ethnicity. Part-time students, however, were underrepresented in the CCSSE sample because classes are sampled rather than individual students. (About 27% of CCSSE respondents are enrolled part-time, and 73% are enrolled full-time. IPEDS reports the national figures as 59% part-time and 41% full-time.) To address this sampling bias, CCSSE results are weighted by part-time and full-time status to reflect the institutions’ actual proportions of part-time and full-time students.
- 2011 CCSSE Cohort respondents are 57% female and 43% male. These figures mirror the full population of CCSSE Cohort community college students.

The 2010 SENSE Cohort

In this report, SENSE data include only entering students — students who indicate that it is their first time at their college. The 2010 SENSE Cohort includes all colleges that participated in SENSE in 2009 and 2010.

- The 2010 SENSE Cohort includes approximately 75,000 entering students from 172 institutions in 35 states plus the District of Columbia and the Northern Marianas. SENSE colleges in the United States represent a total enrollment of 1,357,713 students.
- The survey was administered in classes randomly selected from the population of all first college-level English, first college-level math, and developmental education courses (excluding ESL courses). These are the courses most likely to enroll entering students.
- In SENSE sampling procedures, students are sampled at the classroom level. As a result, full-time students, who by definition are enrolled in more classes than part-time students, are more likely to be sampled. To adjust for this sampling bias, SENSE results are weighted based on the most recent publicly available IPEDS data.
- The special-focus module on promising practices was administered in 2011 only. Data on those items come from 2011 CCSSE or 2011 CCFSSE respondents.

With respect to race/ethnicity, 2011 CCSSE Cohort respondents, 2010 SENSE Cohort respondents, and the national community college population may be compared as follows:

<table>
<thead>
<tr>
<th>Race/ethnicity</th>
<th>CCSSE respondents</th>
<th>SENSE respondents</th>
<th>National percentages</th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td>62%</td>
<td>54%</td>
<td>54%</td>
</tr>
<tr>
<td>Latino/Hispanic</td>
<td>12%</td>
<td>18%</td>
<td>16%</td>
</tr>
<tr>
<td>Black</td>
<td>11%</td>
<td>15%</td>
<td>14%</td>
</tr>
<tr>
<td>Asian or Pacific Islander</td>
<td>4%</td>
<td>3%</td>
<td>6%</td>
</tr>
<tr>
<td>Native American</td>
<td>2%</td>
<td>2%</td>
<td>1%</td>
</tr>
<tr>
<td>Other</td>
<td>4%</td>
<td>4%</td>
<td>10%</td>
</tr>
</tbody>
</table>

Sources: 2011 CCSSE Cohort data; 2010 SENSE Cohort data; IPEDS, Fall 2009.

Percentages may not total 100% due to rounding.
2011 CCIS Respondents

There were, in total, 336 colleges that responded to the CCIS in its first administration. These colleges are located in 45 states, plus the District of Columbia, three Canadian provinces, and the Bahamas. The U.S. colleges come from all six accreditation regions, with a slight overrepresentation of colleges accredited by the Southern Association of Colleges and Schools and the New England Association of Schools and Colleges.

The CCIS colleges serve urban, suburban, and rural settings in the same proportions as all other community colleges nationally, though the colleges that responded tended to be large in their enrollment sizes. CCIS respondents are similar to other community colleges in terms of the proportion of colleges participating in Achieving the Dream and Completion by Design initiatives.

When looking at the enrollments in CCIS colleges by demographic characteristics (full-time versus part-time, gender, race, and age groups), the proportions of these groups in the student body were not statistically different from other colleges nationwide. There was a lower proportion of some race/ethnicity groups, and student populations at CCIS-responding colleges tended to be slightly younger than students among the remaining community colleges in the United States.

In short, this means that CCIS colleges are on average larger, slightly less diverse in limited aspects, and have a slightly younger student body than their peers nationally. These 336 colleges collectively enroll roughly 2.5 million students.

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Endnotes


14 CCSSE uses the Carnegie Classifications (from the Carnegie Foundation for the Advancement of Teaching) to identify colleges as urban serving, suburban serving, and rural serving.

15 2004 National Study of Postsecondary Faculty.
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CCSSE and SENSE Member Colleges

For lists of CCSSE and SENSE member colleges, visit www.cccse.org.

Editorial support and design by KSA-Plus Communications, Inc.
Assessing the Effectiveness of a College Freshman Seminar Using Propensity Score Adjustments

M. H. Clark · Nicole L. Cundiff

Received: 15 November 2009 / Published online: 11 January 2011
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Abstract Researchers investigated the impact that a first-year college experience course had on students’ first-year grade point averages (GPAs) and retention rates. A sample of 109 first-year students enrolled in the course was compared to a sample of 326 students from the same university who had not taken the course. The goals of the experience course were to reduce attrition, increase grade point averages, and enhance academic skills. Without accounting for selection bias, those who took the course had similar retention rates and lower GPAs than those who did not take the course. After matching on propensity scores, the negative effects of the program on GPA were nullified and those in the program were more likely to enroll for a second year. Although the benefits from the course were weak, the positive impact of the program was more apparent after accounting for individual differences.

Keywords First-year seminar · College retention · Academic success · Propensity scores · Selection bias

Universities worldwide are concerned with the retention and success of students, especially those who struggle during their first-year of college (Grayson 1988; Koutsoubakis 1999; Krause et al. 2005; McInnis 2001). For instance, Australian administrators started focusing on student success and adjustment as early as 1956, finding that first-year students needed specific pedagogy. To assist students with their adjustment to higher-education environments, university faculty and staff began to mentor students and teach them performance-enhancing material (Krause et al. 2005; McInnis 2001).

Within the United States, Miller et al. (2007) reported that less than 60% of first-time attending students complete their degree within six years and, on average, only 73% of...
first-year students continue to take courses for a second-year. In reports from several universities between 2004 and 2006, ACT found that approximately 30% of students did not return to those institutions for a second year. As expected, retention rates do vary depending on the type of institution. Universities with a higher selection criterion for admission have higher retention rates than average, whereas two-year, public institutions have considerably lower rates (ACT 2006). However, even among those universities that face the lowest attrition rates, student retention is critical in maintaining the prestige and financial support for those universities. Consequently, interventions focusing on retention and success of first-year students are important for institutions of higher learning.

Given the plethora of literature concerning retention (Astin 1993; Aitken 1982; Cabrera et al. 1993; Engberg and Mayhew 2007; Grayson 1988; Hunter 2006; Strauss and Volkwein 2004; Tinto 1993, 1998), it is clear that universities have been battling student attrition for many years. However, a second concern is how well students perform while they are attending. Not only is academic performance a predictor of degree persistence (Cabrera et al. 1993; Nora et al. 1996; Roweton 1994), it is also a measure of students’ education quality.

It is not sufficient that we keep students enrolled in courses; they must also learn from those courses. Therefore, it is important to learn what factors contribute to early academic success. While high school grade point average (GPA) and college entrance exam scores are strong predictors of academic achievement (Harackiewicz et al. 2002; Wolfe and Johnson 1995), there are other factors that can substantially contribute to college success. For instance, DeBerard et al. (2004) found that gender, health behavior (i.e. smoking and binge drinking), social support, and coping ability were also related to first-year GPA. McKenzie and Schweitzer (2001) found that institutional integration and self-efficacy predicted academic performance; and Busato et al. (2000) showed that intellectual ability, learning style, achievement motivation, and conscientiousness were related to academic performance over a three-year period. Unfortunately, even among students who do finish college, first-year GPAs tend to be lower than GPAs acquired as students progress through college (Harackiewicz et al. 2002). Despite this trend, there is still a strong correlation between first-year and later-year GPAs, suggesting that first-year GPAs serve as objective predictors of overall academic achievement.

Many students entering four-year institutions face a high risk for attrition as they attempt to integrate into a college lifestyle, such as being responsible for attending classes and completing homework while being away from their family support structure for the first time (Koutsoubakis 1999). Educational researchers, responding to administrator and faculty concerns that many students were not adjusting to academic settings, have designed programs aimed to reduce attrition and poor academic performance (Barefoot 2000; McInnis 2001). Students leave universities prematurely for a variety of reasons, some by choice and some due to academic failure. While no program can address all of these problems, several programs attempt to reduce student attrition and academic failure, primarily by using strategies that emphasize students’ adaptation to college and university climates. Consequently, many colleges and universities have created semester-long courses that teach first-year students strategies for adapting to and succeeding in college (Koutsoubakis 1999; Tobolowsky et al. 2005).

Despite the popularity of these experience courses, it is not entirely clear how effective they are in retaining students and influencing academic performance. While several previous studies (Koutsoubakis 1999; Yockey and George 1998; Wolf-Wendel et al. 1999) have examined the impact of the courses, the treatment effects are not consistent. One of the possible reasons for these differences is due to selection bias when students are not
randomly assigned to enroll in the course. Therefore, the present study seeks to examine
two primary concerns when evaluating these first-year experience courses: (a) whether or
not such a course benefits students in terms of retention and academic performance after
accounting for individual differences, and (b) how self-selection into the course impacts
the treatment effects from an evaluation of this academic program.

Academic and Social Integration Programs

According to Keup (2005), three programs commonly used to help first-year students
acclimate to college settings are first-year seminars, service learning, and learning commu-
nities. First-year seminars are small discussion courses that focus on teaching basic study
skills, academic planning, and time management. Service learning is provided through a
course, but includes community experiences to which students can apply what they learn in
the classroom. Learning communities are a series of courses that groups of students take
concurrently in the hope of fostering academic and social networks. While each program
varies in terms of the content and format, all of the programs are based on the premise that
student commitment and success depend on students’ sense of belonging to their institutions.

Two of the better-known retention models, the Tinto Student Integration Model (Tinto
1993) and Astin’s Student Involvement Model (Astin 1993), both advocate this premise and
have been adopted by many universities and colleges in planning retention programs
(Koutsoubakis 1999). These models suggest that to be successful students must feel as if they
are part of the institutional community, academically and socially. Academic integration is a
student’s ability to adapt to scholastic expectations and is commonly measured by GPA, time
spent studying, enjoyment of studies, and ability to identify as a student (Tinto 1975).

In addition to adjusting to academic demands, retention models also stress the impor-
tance of social involvement. Social integration is a student’s ability to develop and
maintain social relationships with peers and faculty. This is often measured by the number
of friends a student has, quality of friendships, contact hours with faculty outside of
classroom settings, and participation in social organizations. If students do not socially
acclimate to a new environment by making friends, they often feel isolated, as if they do
not belong on the university campus. While students often focus on academic preparation
for college by taking college preparatory work in high school, many of the social, struc-
tural, and financial factors that contribute to college success are ignored.

Some programs, like new student orientations and those mentioned by Keup (2005),
address both social and academic integration, whereas other programs may focus on one or
the other. Programs that assist students in specific subject areas (i.e., course tutoring) or
educational skills (i.e., writing centers) promote academic integration. Student organiza-
tions, such as fraternities and sororities; topic interest groups, such as a psychology club;
and organized events, such as canoeing trips, encourage social integration. Most univer-
sities have at least one of these programs and many have multiple programs; however, the
most common program is the First-Year Experience Course, also known as the First-Year
Seminar (Tobolowsky et al. 2005).

First-Year Experience Courses

Boston University was the first institution to offer a first-year experience course. By the
1930s, nearly a third of U.S. based institutions offered some type of first-year seminar, and

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today over 90% of colleges and universities offer such a program (Tobolowsky et al. 2005). Approximately half of these institutions require all of their first-year students to enroll in these courses, while 20% allow students to take the courses voluntarily (Tobolowsky 2006). In some universities, the course is required only for those students meeting certain requirements (i.e. athletes, undeclared, or honor students) or those who are at a greater risk for retention (i.e. those provisionally admitted; Tobolowsky et al. 2005).

According to Barefoot and Fidler (1992), there are five common class formats used to orient first-year students to college. These are: (a) extended orientation seminars, which introduce students to “campus resources, time management, study skills, career planning, cultural diversity, and student development issues” (p. 2); (b) academic seminars with uniform academic content across sections, which focus on a particular discipline or major, but also includes general academic and skill building exercises; (c) academic seminars on various topics, which are similar to the previous seminar type except that sections feature different disciplines; (d) professional seminars, which prepare students for a specific major; and (e) basic study skills seminars, which teach study habits, such as note taking and reading, to those who are unlikely prepared for academics. Of these five types of courses, the most common format is the extended orientation seminar (Tobolowsky et al. 2005). The primary goals of extended orientation seminar are to develop academic skills, provide an orientation to campus and its resources, and to allow for self-exploration and personal development (Tobolowsky 2006). To achieve these goals class sizes tend to be relatively small, less than 25 students per section, and are taught predominately by faculty members, academic advisors, or administrators. Academics and administrators spend a lot of time and resources focused on achieving these goals, and evaluation is required in order to determine the effectiveness of such efforts.

Evaluating First-Year Experience Courses

Nearly half of the institutions surveyed by the National Resource Center for The First-Year Experience and Students in Transition in 2003 indicated that they had formally evaluated the effectiveness of their first-year experience courses (Tobolowsky et al. 2005). Most of these were course evaluations obtained from the students, and nearly a third were based on institutional data. Among the outcomes attributed to the first-year experience courses in 2003 and 2006, approximately half of the evaluations indicated improvements in peer connections, increased use of campus services and activities, persistence to sophomore year, and satisfaction with the university; and a third of the institutions reported an improvement in students’ GPAs (Tobolowsky et al. 2005; Tobolowsky 2006).

Many evaluations base the effectiveness of first-year seminars on how well universities retain students past their first year of college and enhance students’ GPAs (Burgette and Magun-Jackson 2009; Jamelske 2009; Miller et al. 2007; Yockey and George 1998). However, results from previous studies have been inconsistent as to the effectiveness of these programs on retention, GPA, and other outcome measures. For instance, several studies found no difference in retention between students who took a first-year experience course and students who did not (Handel 2001; Koutsoubakis 1999; Wolf-Wendel et al. 1999). Other researchers found that students who took the first-year course were more likely to stay in school past the first year (Burgette and Magun-Jackson 2009; Miller et al. 2007; Yockey and George 1998) and graduate within four years (Lang 2007; Noble et al. 2007).
Similar inconsistencies were found across studies examining how the programs affected GPA. Some studies found that students enrolled in a first-year program had higher GPAs than those who did not participate (Friedman and Alexander 2007; Tobolowsky et al. 2005; Yockey and George 1998), while others found no treatment effects (Koutsoubakis 1999; Wolf-Wendel et al. 1999) or negative effects (Lang 2007).

One of the challenges in evaluating first-year experience courses is that students who enroll in these programs often do so of their own accord. Within universities that do not require the course, students self-select or have an academic counselor recommend that they enroll into it. Therefore, any treatment effects from studies using students who self-select into the seminars are likely to be biased. If these biases are not accounted for, either by design or statistical adjustment, evaluations are not accurate and programs may be misrepresented.

**Selection as a Threat to Internal Validity**

A main concern when evaluating first-year programs in a university setting is the plausible weakness in the internal validity of the results due to the inherently non-experimental nature of the designs. Selection bias is a prevalent problem when evaluating these programs, since students often volunteer to take the courses or academic advisors recommend that they take the courses based on students’ personal characteristics (i.e., having low entrance exam scores, having low high school GPAs, being first generation students, or being an athlete). Because students are not randomly assigned to treatment conditions (course or no course), treatment effects are likely to be biased (Shadish et al. 2002).

Previous researchers have attempted to control for selection bias by adding individual covariates to their models (Keup 2005; Jamelske 2009; Noble et al. 2007); but several of these analyses only accounted for variables of convenience (Burgette and Magun-Jackson 2009; Miller et al. 2007), common demographic characteristics, such as gender, ethnicity, high school GPA, and ACT/SAT scores. Although these particular covariates are good predictors of selection and outcome (Gifford et al. 2006; Porter and Swing 2006), they may not sufficiently reduce selection bias, particularly when only a limited number are used. While some researchers did account for several relevant variables in their studies (Keup 2005; Jamelske 2009; Nora et al. 1996; Porter and Swing 2006), it is highly unlikely that they considered all non-ignorable variables that affect selection into the program. Furthermore, there is evidence that suggests that using aggregate covariates, such as propensity scores, are more effective than single or multiple covariates in reducing selection bias (Cepeda et al. 2003; Grunwald and Mayhew 2008; Peterson et al. 2003).

**Propensity Score Adjustments**

A propensity score is the conditional probability that a participant will be assigned to a condition given a set of observed covariates (Rosenbaum and Rubin 1983). These scores are used to equate groups on those covariates using a variety of statistical adjustments, such as matching (Gibson 2003; Rosenbaum 1995), stratification (also referred to as subclassification or blocking; Leow et al. 2004; Rosenbaum and Rubin 1984), covariate adjustment (Rosenbaum and Rubin 1983; Shadish et al. 2008), or weighting (Hirano and Imbens 2001; McCaffrey et al. 2004). Theoretically, propensity score adjustments reduce the bias created by nonrandom assignment, assuming that all variables that contribute to
selection bias are included in the propensity score model. Although it is not clear which propensity score adjustment method is most effective (Kurth et al. 2006; Shadish et al. 2002, 2008), many studies have found that propensity score adjustments are effective in reducing selection bias regardless of the adjustment method used (Shadish et al.; Stürmer et al. 2006). In most cases, propensity scores reduce bias as well as traditional covariate adjustments, however, some studies have shown that propensity scores are more effective in reducing bias than other methods (Gu and Rosenbaum 1993; Shah et al. 2005; Stürmer et al. 2006). Therefore, we expect that using propensity scores to adjust for covariates that are related to students’ selection into experience programs will provide more accurate treatment estimates for the first-year program than traditional covariate adjustments.

Current Study

The current study proposes to evaluate the effectiveness of a first-year experience course at a moderate-sized, Midwestern university, accounting for likely factors that contribute to selection into this sort of program. In addition, we hope to improve the internal validity for evaluating outcomes in first-year seminars by using propensity scores to adjust for selection bias. While the primary focus of this paper is to evaluate the effects that a first-year experience course has on second-year retention and GPA, we will also examine how well propensity score adjustment methods reduce bias that affects the treatment effects of first-year college programs.

University 101: A New Student Seminar

Like many of the first-year experience courses described by Tobolowsky et al. (2005), the University 101 course at Southern Illinois University Carbondale (SIUC) presents material aimed at getting students socially and academically integrated into the University. According to the mission statement, “The goal of University 101 is to assist first-year, first-semester students in making a successful transition and transformation into SIUC, in order to succeed academically and personally and graduate” (Southern Illinois University 2006a). In addition to what is provided in the mission statement, the course description states that University 101 “examines the purpose of higher education and the student’s responsibility in the learning process. [The course] provides a thorough introduction to the knowledge and skills necessary for a positive academic and personal experience at SIUC” (Southern Illinois University 2008, p. 531). University 101 attempts to improve student–peer and student–faculty interactions through assignments that engage students with peers and faculty, such as interviewing faculty members and attending campus events. Students are also introduced to a variety of social and academic programs offered by the University, such as writing centers and student life programs. To adjust to academic demands, instructors suggest ways for students to take efficient notes and give them opportunities to discuss university policies and procedures.

University 101 at SIUC is voluntary, but often recommended to at-risk students by academic counselors. Students can take the three-credit hour, semester long course as an elective; and approximately 12.27% of first-year students take the course. Classes are small seminars with around 20 students taught by faculty or academic counselors structured to facilitate participation and social involvement (Southern Illinois University 2006b). The short-term goals of the program are to improve the conscientiousness and efficiency of students’ study habits and curriculum planning; make students aware of
opportunities to maintain a healthy lifestyle; and develop new, academically-based friendships. Long-term goals of these programs are to increase the likelihood that students will complete their undergraduate degrees within four years, maintain strong GPAs throughout their college careers, and encourage students to preserve their physical and mental health.

Southern Illinois University Carbondale has approximately 2,660 first-time freshmen students. In 2006, only 70% of those students returned for a second year. The University is relatively diverse for its size (approximately 21,000 undergraduate and graduate students) and location (in a rural region of the Midwestern United States). It attracts many historically disadvantaged groups, such as women and African Americans, and first generation students. SIUC developed its University 101 program in 1980, when retention became a growing issue that needed to be directly addressed. The program was developed using recommendations for successful first-year seminars from the National Resource Center for the First-Year Experience and Students in Transition and the Policy Center on the First Year of College (2009). Unfortunately, the program’s effectiveness was questionable, as retention rates were still relatively high for this institution.

Although student-reported course evaluations indicated that the program was effective in increasing students’ knowledge of university based programs and processes (Pickett 2006), more objective evaluations of this program’s effectiveness were necessary to account for its affects on student retention and academic performance. Because students self-select into SIUC’s University 101 program, it was critical to account for potential bias that may cause misleading outcome effects.

Hypotheses

A primary concern of any educational program is how well it meets its intended goals. Not only do the educational programs themselves vary in how they obtain their goals, but the evaluation methods also impact the observed treatment effects. Therefore, we have assessed how taking University 101 influences first-year grade point average and second-year retention after considering how other variables influence these outcomes.

**Hypothesis 1** Students who take the University 101 course will be different from those who do not enroll in the course. Because students self-select or are advised to take the course, selection bias will be evident by differences between the participants and non-participants on a variety of covariates that are related to academic performance and retention. More specifically, students who take the course will have lower ACT scores and lower high school GPAs.

**Hypothesis 2** After accounting for propensity scores, those who participated in the University 101 program will have higher GPAs than those who did not. Although there are conflicting results about whether or not those who take a first-year seminar course will have higher GPAs or not (Friedman and Alexander 2007; Lang 2007; Tobolowsky 2006); when several covariates were accounted for, Jamelske (2009) found a positive relationship between program participation and academic performance. Therefore, we expect that after considering several individual differences with the propensity scores, we will also find that University 101 will positively influence academic performance.

**Hypothesis 3** After accounting for propensity scores and first-year GPAs, those who participated in the University 101 program will have higher second-year retention rates than those who did not. Although the first-year experience courses are structured to cover
and encourage behavior that improves retention, many of the studies that considered several individual differences found little improvement in second-year retention (Keup 2005; Jamelske 2009; Porter and Swing 2006). However, some researchers have found that specific components of the first-year seminars (i.e. social integration, study skills, healthy lifestyle) were related to increased retention (Nora et al. 1996; Porter and Swing 2006); therefore, it is possible that the effects of the program on retention are small, but not negligible. Since first-year GPA is such a strong predictor of second-year retention (Cabrera et al. 1993; Nora et al. 1996), it is possible that once we accounted for its contribution to retention, we may be able to find a more prominent effect for the first-year course on retention. It is also possible that GPA moderates the relationship between the being in the program and retention, as Jamelske (2009) found that below average students were more likely to benefit from a first-year program than above average students. Although there is less evidence to support moderating effects of GPA, we did test for this relationship in our study.

Methods

Participants

Participants consisted of 435 first-year undergraduate college students enrolled in an introductory psychology course at moderate-sized, rural, mid-western university. To be included in the study, all participants had to grant us access to their academic records. The mean age of the students was 18.77 (SD = 2.51) years old, and 56.09% identified themselves as women. Of the 430 who indicated their ethnicities, 70.70% identified themselves as White, 20.93% as African American, 3.02% as Latino, 2.79% as biracial, and 1.63% as Asian or Asian-American.

Measures

Covariate Measures

We gave participants a battery of tests to assess a variety of traits thought to be related to academic success and college attrition. The battery included measures of demographic characteristics, Big Five personality traits, academic motivation, loneliness, depression, and institutional commitment. The Academic Support Scale was prepared by the present researchers and used to gather demographic information, such as age, marital status, financial needs, family commitments, and interactions with college staff prior to starting college; and academic admissions criteria, such as high school grade point average and ACT scores.

The 50 Big-Five Factor Markers scale (Goldberg 2004) was used to assess five major domains of personality: extroversion, neuroticism, agreeableness, openness to new experiences, and conscientiousness, each of which is measured by 10 items. Goldberg (1999) and Gow et al. (2005) have demonstrated that all five factors in this measure are both reliable (alphas ranging from 0.67 to 0.87) and valid. While not all of these traits may be related to either academic performance or retention, Komaraju et al. (2009) found that conscientiousness, agreeableness, and openness to new experiences were positively related to first-year GPA.
The Academic Motivation Scale College Version (AMS-C 28; Vallerand et al. 1992, 1993, 2004) is a 28-item measure used to determine reasons why students attend college. Its seven subscales include (a) three measures of intrinsic motivation: intrinsic motivation to know, intrinsic motivation toward accomplishments, and intrinsic motivation to experience stimulation; (b) three measures of extrinsic motivation: identified regulation, introjected regulation, and external regulation; and (c) amotivation. Despite having only four items per subfactor, Vallerand et al. (1992, 1993) have established that all seven factors have sufficient internal consistency (alphas ranging from 0.62 to 0.86), test–retest reliability (ranging from $r = 0.71$ to $r = 0.90$), and construct validity. Previous research has indicated that intrinsic motivation to accomplish things, intrinsic goal orientation, external regulation, and academic self-efficacy were all positively related to GPA; and amotivation was negatively related to GPA (Cokley 2003; Komarraju et al. 2009; McKenzie et al. 2004). Previous results between academic motivation and retention are not as consistent. Allen and Robbins (2010) found that academic motivation predicted college retention over a four-year period, but not over a two-year period. However, Nes et al. (2009) found that academic motivation was related to whether or not students completed their first year of college. Other researchers (Vallerand and Bissonnette 1992; Vansteenkiste et al. 2004) have found that students who were both intrinsically and extrinsically motivated were more likely to persist in a variety of educational goals than those who were amotivated.

The Commitment to Institution Scale was used to assess students’ commitment to completing their degrees at Southern Illinois University. This measure is a modified version of the 11-item Initial Goals and Commitments (IGC) subscale from the Institutional Integration Scale used by Satterfield (1999), which was based on Fox’s (1984) version of Pascarella and Terezini’s (1980) Institutional Integration Scale. Satterfield’s IGC subscale included five of the original six items from the Institutional and Goal Commitments subscale (Fox 1984; Pascarella and Terezini 1980) and an additional six items that assessed students’ commitment to their institution and to completing college. Internal consistency for the IGC subscale is $r_a = 0.73$ (Peterson 1993), which is consistent with the reliability for the original six items of Pascarella and Terezini’s Institutional and Goal Commitments subscale ($r_a = 0.71$).

The UCLA Loneliness Scale (Russell 1996) was used to assess loneliness among college students, a particular concern for students who relocate to attend college. This is a 20-item, single factor scale with strong internal consistency (alphas ranging between 0.89 and 0.94), test–retest reliability ($r_a = 0.73$), and convergent and construct validity (Russell 1996). While previous studies are not consistent in how loneliness directly affects GPA (Ginter and Dwinell 1994; Norman 2003), it can influence academic persistence (Nicpon et al. 2006). Students who are not socially integrated into an institution are at higher risk for dropping out (Tinto 1993), and loneliness is an indicator of social integration. The Beck Depression Inventory (short form) (BDI; Beck and Beck 1972) is a 13-item measure used to assess general depression. Reynolds and Gould (1981) have demonstrated that the 13-item BDI is both reliable ($r_a = 0.83$) and valid. While some researchers have found no relationship between depression and either GPA or retention (DeBerard et al. 2004); others have found that depression moderates the relationship between students’ perceptions of themselves as students and GPA (Lane and Gibbons 2007) and those who are depressed are more likely to drop out during their first two years of college (Krum et al. 2009). Furthermore, Napoli and Wortman (1998) found evidence that social support and psychological well-being were related to GPA, and Phillips (1997) found that depression was positively related to college maladjustment. Therefore, it is plausible that we might find that depression relates to academic outcomes in our sample.
Outcome Measures

First-year grade point average (GPA) was measured using the mean of students’ fall and spring semester GPAs. Second-year retention was determined by whether or not students enrolled for courses in the fall semester following their first year of college.

Sampling Strategy

Participants were recruited from an introductory psychology course as part of a study examining traits related to academic success and college attrition. Data were collected from students in small groups from several first-year cohorts from fall 2004 to fall 2007. All participants had to be college freshmen willing to provide researchers access to their college academic records. While there were no foreseeable risks, ethical standards to protect participants were maintained throughout the study and participants received course credit for their participation.

From the total sample, we identified 109 students who were currently enrolled in—or had previously taken—the University 101 course during their first year of college. These students were designated as the treatment group and the remaining 326 students made up the control group. The University’s Office of Academic Records and Registration provided each student’s GPAs for his or her first year in college and whether or not the student enrolled for a second year.

Analytic Procedures for Propensity Score Adjustments

Computing Propensity Scores

Propensity scores were estimated from a set of 19 covariates using a logistic regression in SPSS v.15. To be most effective, propensity scores should be based on covariates that are related to both selection into the treatment condition and the outcome. Covariates that are not related to selection into conditions are already balanced across treatment conditions and those that are not related to the outcome are not directly influencing it (Austin et al. 2007). Potential covariates were obtained from the measures described previously and were considered for inclusion in the propensity score model if they were related to first-year GPA, second-year retention, or enrollment in University 101. To be as inclusive as possible, covariates were considered to be related to the outcomes or program participation if they were statistically significant at \( p < 0.20 \). Table 1 lists the covariates that met the inclusion criterion and those that failed to meet the criterion. While the predicted probabilities that result from a logistic regression are commonly used as propensity scores, Rubin (2001) suggests that using a logit transformation often results in better propensity scores.

The transformed propensity scores were evaluated for balance, how evenly they were distributed across the treatment conditions, using Rubin’s criteria (2001). These criteria state that for propensity scores to adjust effectively for selection bias: (a) differences in propensity score means should be less than half a standard deviation apart, (b) the ratio of propensity score variances should be close to one, and (c) the ratio of the variances of the residual errors of each covariate predicting propensity scores must be close to one. For our sample, the standardized mean difference between the propensity scores in the treatment and control groups was \( d = 1.21 \). Although this does exceeded one standard deviation, this result alone is not enough to discourage us from using propensity scores to...
adjust for selection bias in this sample. However, it does suggest that the distributions of propensity scores for the treatment and control groups may not overlap enough to effectively match people in the treatment group with those in the control group. The ratio of the variances was 0.68. To meet Rubin’s second criterion, this value must be between 0.5 and 2, therefore, our data met this assumption. Of the 19 covariates that we used to compute propensity scores, all had residual error ratios that ranged between 1.52 and 1.87 when regressed on the predicted probabilities. Like the second criterion, these ratios must also be between 0.5 and 2; therefore, our data met the third statistical assumption as well.

### Table 1
Correlations of covariates with selection in University 101 and student’s first-year college GPA, and second-year retention

<table>
<thead>
<tr>
<th></th>
<th>University 101</th>
<th>College GPA</th>
<th>Retention</th>
<th>n</th>
</tr>
</thead>
<tbody>
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<td>1</td>
<td></td>
<td></td>
<td>435</td>
</tr>
<tr>
<td>College GPA</td>
<td>-0.126***</td>
<td>1</td>
<td></td>
<td>435</td>
</tr>
<tr>
<td>Retention</td>
<td>0.046</td>
<td>0.305***</td>
<td>1</td>
<td>431</td>
</tr>
</tbody>
</table>

Covariates that were used to compute propensity scores

1. High school GPA   -0.335*** 0.498*** 0.136*** 393
2. ACT               -0.356*** 0.305*** 0.060  407
3. Extraversion      0.108** 0.067* 0.308  435
4. Agreeableness     0.015** 0.181*** 0.068*  435
5. Conscientiousness 0.046 0.250*** 0.139*** 435
6. Neuroticism       0.080* 0.036 0.106** 435
7. IM to know        0.004 0.156*** 0.084* 435
8. IM to accomplish  0.091* 0.117** 0.077* 435
9. IM to experience  0.060 0.030 0.016* 435
10. Identified regulation 0.023 0.114** 0.033 435
11. Introjected regulation 0.145*** 0.008 -0.032 435
12. Amotivation      0.018 0.303*** 0.060 435
13. Commitment to university 0.055 0.065* 0.148*** 435
14. Loneliness       0.019* 0.152*** 0.118* 435
15. Depression       0.005 0.208*** 0.024 435
16. Female           0.020 0.208*** 0.024 435
17. Caucasian        -0.083* 0.243*** -0.030 435
18. African American 0.137*** 0.230*** 0.064* 435
19. Employed         -0.004 0.125*** 0.056 435

Covariates that did not meet the criterion to be included in the propensity score model

20. Openness to experiences 0.005 0.042 0.036 435
21. External regulation -0.016 0.030 -0.060 435
22. Age                -0.033 0.045 0.004 435
23. Married/cohabitating -0.013 0.010 0.005 435
24. Mother’s education 0.032 0.018 0.037 416
25. Father’s education 0.010 -0.028 -0.012 390

* p < 0.20, ** p < 0.05, *** p < 0.01
Statistical Adjustments with Propensity Scores

Although there are several common methods used for adjusting non-randomized experiments using propensity scores, we believed that stratification and matching (methods that group students by their propensity scores) would be most effective in distributing several observed characteristics equitably between the treatment and control groups. Most of the participants in this study were not enrolled in University 101. Therefore, the distribution of propensity scores was positively skewed, predicting that most students would not enroll in University 101. Likewise, the first test for Rubin’s (2001) balancing criterion (mentioned above) suggested that the propensity scores in the treatment group were considerably higher than those in the control group. This difference in the propensity score distributions is problematic when trying to find comparable matches in the control group for students in the treatment group. While all statistical adjustment procedures are affected by this, stratification permits a form of group matching that usually retains all participants. Therefore, we can improve the internal validity of the study without sacrificing the external validity by dropping participants. While matching frequently drops cases that do not have close matches, those matches that are retained tend to be between cases that are very similar on covariates. This decreases the error variance between matched cases, thereby providing a less bias treatment effect. For comparative purposes we used both methods for adjusting outcomes with propensity scores.

Stratification  Propensity scores were divided into five strata, in which each stratum contained 20% of the participants. Because the distributions of propensity scores for the treatment and control groups were different, there were fewer participants in the first three strata for the treatment group than for the control group. Additionally, there were fewer participants in the last strata for the control group than for the treatment group. A factorial analyses of variance (ANOVA) was used to partial out the variance for the strata when the outcome variable was first-year GPA and a logistic regression (with dummy coded strata) was used when the outcome was second-year retention.

Matching  A greedy matching procedure, which selects the closest matches first and then selects progressively farther matches, was used to match treatment cases to control cases. Suitable matches were determined by standards set forth by Cochran and Rubin (1973) to reduce 95% of the bias given the homogeneity of variances between the treatment groups on the matching variable, in this case, the propensity score. Because there were three times as many students who did not enroll in the program as those who did, we allowed as many as three students in the control group to be matched with each student in the treatment group. The matching procedure was written in GAUSS version 6 and is available from the first author. To estimate treatment effects, matched cases were treated as random effects in a mixed-effects ANOVA when the outcome variable was first-year GPA. A mixed-effects logistic regression, using the glimmix procedure in SAS version 9.2, was to estimate second-year retention.

Results

Missing Data

Of the 27 covariates and outcomes used in this study, 20 variables had complete data (435 cases). We could not find retention data for four students, therefore, the hypotheses testing
for the program’s effect on second-year retention used only 431 participants. Among the covariates used to compute propensity scores, 42 students did not report high school GPAs and 28 did not report college entrance exam scores (ACT or SAT). These missing values were not imputed when computing propensity scores. Instead, propensity scores were computed separately for students who were missing GPA, ACT, or both using the available covariates (Rosenbaum and Rubin 1984). However, all missing values were imputed when comparing the characteristics of those who enrolled in University 101 to those who did not. Missing values were also imputed for covariates that were not included in the propensity score model, but were tested for differences in Hypothesis 1. These covariates were: Mother’s level of education, which was missing 19 observations, and Father’s level of education, which was missing 45 observations. All missing values were predicted based on available data using multiple regressions (EM algorithms without additional error; Allison 2001). Had the values not been imputed, 22.53% of the sample would have been dropped to compute Hotelling’s $T^2$.

Hypothesis 1

Hotelling’s $T^2$, a multivariate $t$-test, was used to test differences between the participants and non-participants on several covariates thought to influence selection into the program, academic performance, and retention. The multivariate $t$-tests indicated that those who selected into University 101 were different from those who did not, $T^2 = 0.283, F(25, 409) = 4.633, p < 0.001$.

Out of 25 covariates tested, seven were statistically significant at $p < 0.05$. Students who enrolled in University 101 tended to have lower high school GPAs and ACT scores; were more extraverted, agreeable, obliged to attended college (introjected regulation); and were less lonely than those in the comparison group. Although there was no difference between the number of Caucasian students in the program and the comparison groups, African American students were more likely to enroll in the program. Table 2 provides the complete statistics for all of the covariates.

Hypothesis 2

Unadjusted Results

An independent measures $t$-test was used to assess the effect of the University 101 course on first-year GPAs without considering the factors that may influence enrollment into the University 101 course. Without adjusting for selection bias, those who took University 101 had lower first-year GPAs ($M = 2.690, SD = 0.828$) than those who did not ($M = 2.939, SD = 0.863$), $t(433) = -2.64, p = 0.009$.

Adjusted Results

After stratifying on propensity scores, there was no difference in GPA averages between those who took University 101 and those who did not. Matching on propensity scores also indicated that there was no difference in GPA averages between those who had and those who had not participated in the program. However, it should be noted that only 54 (49%) treatment units were analyzed in the matched analysis, as 55 were dropped because they did not have suitable matches. Table 3 provides the means, standard deviations, and $F$ ratios for the adjusted effects of University 101.
Hypothesis 3

Unadjusted Results

A logistic regression indicated that, without accounting for covariates, the proportion of students who returned to the University for a second year did not depend on whether or not...
they participated in University 101, $\chi^2(1) = 0.930, p = 0.335$. Of those who did participate, 81.31% returned for a second year; and 76.85% of the students who did not participate in the program returned.

**Adjusted Results**

To assess how both University 101 enrollment and first-year GPA influenced retention, we test fully saturated models using both statistical procedures. The stratified models included dummy codes for each propensity score stratum, first-year GPA, program participation, and all two- and three-way interactions. The matched analyses treated the matches as a random effect and first-year GPA, program participation, and the interaction between GPA and program participation as fixed effects. The change in the $-2 \log$ likelihoods ($-2LL$s) between each model was used to determine the best model fit. Table 4 provides odds ratios, $-2LL$s, and change in $-2LL$s (model fit Wald Chi Square statistics) for each model.

After stratifying on propensity scores using a logistic regression, there was no difference between groups in their retention rates even after accounting for GPA as an additional covariate, nor did GPA moderate the relationship between program participation and retention. However, first-year GPA was a significant predictor of retention; those with higher GPAs were more likely to enroll for a second year in college than those with low GPAs. Like stratifying, after matching on propensity scores, we found that GPA did not moderate the relationship between program participation and retention and that those with high GPAs were likely to return for a second year. However, the matched analysis indicated that there was a main effect for program participation after accounting for first-year GPA. One possible reason for the difference in statistical adjustments is that the matching procedure dropped several participants from the analyses. Once again, of the 431 participants used in the stratification analyses, only 55 (51.40%) of the treatment participants were retained for the matched analyses.
Discussion

Outcome Effects

GPA

Unfortunately, we did not find that students who took the experience course had higher GPAs than those who did not take the course even after adjusting for selection bias, as we had predicted. However, we did find evidence that selection bias was affecting outcome scores and that selection bias could be reduced using statistical adjustments. Before adjusting for selection bias, those who participated in the program had lower GPAs than those who did not participate, implicating that the program was unsuccessful. Additionally, because GPA was measured after the program, it may be plausible to conclude that the program had harmful effects on student’s academic performance. However, if one considers the impact that other pre-existing characteristics have on the outcomes, it is more feasible that those who enrolled in the program had a weaker disposition for academic performance than those who did not participate in the program. Some of the factors, such as high school GPA and ACT scores, contributed to both first-year college GPA and selection into University 101, which biases any effects that the program may have had on college GPA. The propensity score adjustments improved the balance between the treatment and control groups so that a more equitable comparison could be made. Once we corrected for variables that contributed to selection bias, we found that the negative “effect” of the program was nullified. While these results favor propensity score adjustment analyses, it does not provide evidence that the first-year experience course assists in improving students’ grade point averages.

Retention

The adjusted results for retention are less consistent, but perhaps more promising. Without any adjustment, it appears that University 101 has no impact on retention rates. After adjustments were made, the magnitude of the treatment effect depended on the adjustment method. Although adding propensity scores improved the model fit for both stratification ($\chi^2(8) = 15.340, p = 0.052$) and matching ($\chi^2(1) = 20.360, p < 0.001$), only when we matched on propensity scores and included GPA as a covariate did we find increased retention rates for those in the program.

Selection Bias

Our first hypothesis addresses the primary problem when evaluating the effects that first-year experience programs have on retention and GPA. Students who voluntarily choose to take the experience course are different from those who do not even before enrolling in the course. In addition to having significantly lower ACT scores and high school GPAs, students who enrolled in University 101 also tended to be different from those who did not take the course on a number of personality characteristics.

Only six of the 25 covariates that were available to adjust for individual differences did not meet the criterion for inclusion in the propensity score model. Three of these were probably not related to the outcomes or selection because responses were not distributed well across the possible range of scores and could not be statistically transformed to
improve their distributions. Age had a restricted range, since the sample was limited to first-year students; only five students were married; and external regulation was exponentially distributed, in which more than half of the students indicated strong external motivation for attending college. Openness to new experiences and parents’ education provided less intuitive results, since the responses were reasonably distributed. We had expected positive relationships between parents’ education and retention, and between openness to new experiences and academic performance, since openness to new experiences is sometimes used as a measure of intellect (Goldberg 2004).

Although we cannot be sure that the University 101 program did not influence students’ personalities, as individual differences not measured over time, most of the characteristics we measured are relatively stable among young adults (Vallerand et al. 1993; Viswesvaran and Ones 2000). However, it is possible that some individual differences, such as loneliness and depression, did change because of the program and over time for all students as they adjusted to college, but we cannot be sure. Because we know that those who elected to take the University 101 course were different from those who did not, it is possible that these characteristics influenced students’ selection into the University 101 course. Therefore, the groups are not comparable without considering these differences.

Study Limitations

The largest drawback from the results in this study is that we did not find that students who took University 101 were performing better academically nor was it entirely clear that they were less likely to drop out after their first year. While it is quite possible that the experience course did not affect these outcomes, there are other possible explanations for our findings. One of the most likely explanations is that we did not account for all possible variables that contribute to selection bias. One of the primary assumptions when computing propensity scores is that all non-ignorable covariates are included in the propensity score model. Although we included several covariates that contributed to selection and the outcomes, there may be several unobserved variables, such as family obligations or attention deficit disorders, that we could have accounted for to obtain less biased treatment effects. While we found that many of the same factors that affected first-year GPA also predicted second-year retention, most of our covariates were better predictors of GPA. DeBerard et al. (2004) were able to account for over 50% of the variance contributing to GPA, but the same ten variables did not predict retention. Therefore, it is possible that the variables that we included did not sufficiently account for the selection bias that affects retention and academic performance.

A second reason for the null effects is that we did not account for nesting within treatment groups. The University 101 course material may have varied depending on the class of students, course instructor, and year in which the course was taught. Any of these variations may have influenced the outcomes. Unfortunately, we could not identify which class sections students had taken and could not adjust for these potential treatment variations.

Another statistical limitation was in violating one of the assumptions in having balanced propensity scores. Rubin’s (2001) first criterion, having similar distributions of propensity scores for the treatment and control groups, was not met. This violation was the most likely reason for dropping so many cases in the matched analyses. Although we also used an approach that was less affected by this violation, it is still possible that our inability to sufficiently equate groups on the propensity score was problematic. Had we achieved
better-balanced propensity scores across the covariates we might have found higher GPAs and retention rates for those who took University 101.

While most of the methods used in this study focused on improving internal validity, we would be remiss if we did not address external validity. In particular, this study is potentially threatened by an interaction of the casual treatment with units, in which the participants who elected to participate in this study may not represent all first-year college students. Although participants signed up for this study without knowing what we were investigating, participation was restricted to those who were taking an introductory psychology course during their first-year in college and were willing to grant us access to their academic records. Nearly 65% of the first-year students at the university where this study was conducted take the psychology course from which we recruited (M. Komarraju, Personal communication, February 12, 2010). However, students are permitted to choose which social science courses they take to fulfill their core courses. Therefore, it is very likely that those who participated in our study are characteristically different from those who did not. Without measuring traits of those who did not participate, we cannot say for sure that our sample is similar to students we did not include. Therefore, we recognize that it may not be reasonable to generalize our findings beyond those students who took an introductory psychology course.

Finally, we recognize that we only examined a couple of short-term outcomes associated with the first-year program’s goals. While University 101 hopes to have an impact on students’ academic performance and retention, the full effects of the program could be delayed. We examined first-year GPAs and second-year enrollment for those who had taken University 101 in their first-semester; however, we did not evaluate students’ GPAs after their first-year. Likewise, we only checked to see if students had enrolled for a second year in college, not whether or not they had completed it. It is possible that those who took University 101 will have had higher GPAs and better retention over time.

Future Research

Because the present evaluation looked at only a couple of short-term outcomes, the most useful extensions to this study are to examine the long-term outcomes of these and other goals of the program. While GPA and retention are good measures of academic success, many students improve their GPAs during their last two years and others are still at risk for dropping out even after their first year. Therefore, it would be useful to conduct a follow-up of how the University 101 program might affect graduation rates and final GPAs. University 101 also promotes social and academic integration, both of which Tinto (1975, 1993) claims improve academic success. Regardless of the program’s impact on academic success, social engagement among peers and faculty is still a desirable outcome. Therefore, it would be helpful to know if the experience course improved students’ social skills regardless of its effects on GPA and retention. Future research may examine relationships between first-year programs and social skills with faculty and peers, students’ self-confidence, students’ satisfaction with their education, and final level of education (i.e. did students later pursue graduate or professional degrees).

Implications

Program and Policy Implications

As program evaluators, we were concerned with how effective the University 101 program was in improving students’ academic success and retention at Southern Illinois University.
However, for other universities adopting or developing their own first-year college experience courses, it is important to consider how well we can generalize these findings to other universities. The University 101 course was developed from recommendations and evidence based studies from the National Resource Center for the First-Year Experience and Students in Transition and the Policy Center on the First Year of College. While first-year experience courses at other universities vary in terms of the specific content and assignments, it is likely that those programs that promote social and academic integration, teach study skills, and encourage students to maintain their mental and physical health will have similar results as the University 101 program. Southern Illinois University is a public university with several bachelors, masters, and doctoral programs housed within a variety of colleges. While the effects of this study may not generalize to four-year, liberal arts colleges or Northeastern, Ivy League universities, it would be reasonable to presume that universities with similar demographics would find similar effects to those found here.

Given the weak impact that the program had on first-year GPA and retention, we cannot help but question the value of such a program for all students. While it seems unlikely that such a program is truly harmful to students’ adjustment to college and academic success, administrators should consider the implications of a program that does not improve intended program outcomes. Many universities require all of their first-year students to take these experience courses. Additional courses may benefit students, but not when other course requirements are cut due to insufficient staffing or to limit credit hour requirements for graduation. Until it is clear that such a program is beneficial for all students, it may be better to leave experience courses as electives for students who want to take them rather than making these courses part of the required curriculum.

Taking a formative approach to evaluation, the program would benefit most by knowing what particular aspects of the course were most effective and which were least effective. More importantly, if the existing program is not sufficiently meeting its outcome goals, how can it be changed? Our outcome evaluation did not formally investigate treatment alternatives, therefore, we are left to speculate about potential practices based on what we know about factors that are related to retention and first-year GPA. Of the variables that had the strongest relationship to first-year GPA or second-year retention, many of them are not characteristics that could be changed during students’ first-year in college (i.e. high school GPA, ACT scores, gender, ethnicity). Those that could be most easily adjusted, are already addressed in University 101. The program currently teaches study skills, time management, facilitates personal interactions with faculty and peers, and provides resources for tutoring; which are directly or indirectly related to performance and persistence. One could argue that personality could be shaped, but characteristics such as conscientiousness and agreeableness are already encouraged.

Although academic motivation is fairly stable over time (Vallerand et al. 1992), the program could help students explore how college could meet their personal and professional goals when they are not immediately apparent. Students frequently attend college because it is socially expected or they feel they have few other alternatives. Guiding students to activities or majors that they truly enjoy could increase internal motivation. Career counseling commonly includes assessments that match college students to college majors based on personality, interests, and abilities. While it may not be practical to provide full service career counseling to all students in the first-year experience courses, a brief assessment may be feasible.

Many of the measured characteristics that were related to retention could be addressed through mental health counseling or social support groups. Neuroticism, loneliness, and depression are likely outcomes of poor social integration, which may explain why they are
also related to retention. Although the first-year experience course provides resources for social engagements, some students may need more individually tailored interventions. Again, full service counseling is impractical for all students in the experience course, but brief assessments may permit instructors to screen for potential mental health concerns.

Methodological Implications

As methodologists, we hope that future researchers and evaluators will consider how selection can influence outcomes in program evaluation and make efforts to control or reduce threats to internal validity. When researchers account for individual differences that influence selection, we are more likely to obtain unbiased treatment estimates. How this is done may vary depending on the specific circumstances of the program and the evaluation design. Propensity score adjustments are effective methods for correcting selection bias when randomized designs cannot be employed, but they are not the only option. Regardless of the method used to control or correct for selection, it is essential to consider as many potential covariates that may affect both selection into programs and outcomes for those programs.

Acknowledgments

We would like to thank Virginia Rinella for providing information about the University 101 program; Michael E. Young and Sue M. Marcus for their statistical recommendations; and Matthew Herman, Vinetha Belur, Steven Middleton, Deborah Racey, Alen Avdic, and Blake Hutsell for collecting the data.

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I. Success of First-Time-In-Any-College Students, Fall 2009

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*Statistically significant difference at p < .05
**Statistically significant difference at p < .01

II. Fall 2011 FTIAC High School GPA vs. GRCC First-Term GPA

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EXAMINING THE ACADEMIC PERFORMANCE AND RETENTION OF FIRST-YEAR STUDENTS IN LIVING-LEARNING COMMUNITIES AND FIRST-YEAR EXPERIENCE COURSES

John R. Purdie, II
Western Washington University

Vicki J. Rosser
University of Nevada, Las Vegas

Institutional data were used to examine the grades and retention of first-year students in 2 types of living-learning communities—Academic Theme Floors (ATFs) and Freshman Interest Groups (FIGs)—and a First-Year Experience (FYE) course. Multiple regression revealed students in FIGs earned nominally higher GPAs (standardized β = .02, p < .01). Logistic regression revealed participating in a FIG increased students’ odds of being retained by 18% (Exp(β) 1.18, p < .05). Participating in an ATF or FYE did not improve grades or retention. Findings suggest retention can be improved when faculty members and student affairs practitioners collaboratively create programs that link the curricular and residential experience, and foster student interaction with peers and faculty who share an academic interest.

The need to improve U.S. higher education has been clearly and repeatedly articulated for more than twenty years. In the early 1980’s the U.S. Department of Education convened a panel of experts to examine the state of higher education and it issued a report calling for “demonstrable improvements in student knowledge, capacities, skills, and attitudes between entrance and graduation” (Study Group on the Conditions of Excellence in American Higher Education, 1984, p. 15). Other calls for reform have followed. One of the most frequently cited examples, *American Imperative* (Wingspread Group, 1993), demonstrates why the American people need their colleges and universities to dramatically improve in terms of access, retention, graduation, and the quality of education leading to a baccalaureate degree. The Spellings Commission has continued this theme, asserting that “most colleges and universities don’t accept responsibility for making sure that those they admit actually succeed” (U.S. Department of Education, 2006, p. xii), and calling for improvements in six areas: access, cost and affordability, financial aid, learning, transpar-
ency and accountability, and innovation. In short, the case for needed improvements has been consistent and well made.

One area of higher education that has continued to challenge colleges and universities, even though it has been the subject of study for over 75 years (Braxton, 2000), is the retention of first-year college students. Although Adelman (2006) points out that about 90% of all first-year college students are enrolled in some college or university at some point during the following calendar year (i.e., only 10% have fully 'dropped out'), there seems to be no justification for the fact that nationally about half of all first-year students do not persist to the second year at the institution in which they originally enroll (Pascarella & Terenzini, 2005). Student success rates, as measured by retention, vary widely depending on institutional type (Ishler & Upcraft, 2005). Specifically at four-year institutions, most studies report only 72 to 79 percent of first-year students persist to the second year (Pascarella & Terenzini, 2005).

Many institutions have put forth significant effort to improve student learning and success, and most colleges and universities have some form of transitional support program in place for first-year students (Barefoot, 2000). Living-learning communities are becoming widely viewed by student affairs practitioners as a powerful opportunity to positively affect a variety of student outcomes (Inkelas, Soldner, Longerbeam, & Leonard, 2008; Shapiro & Levine, 1999) including retention and GPA performance of first-year students (Stassen, 2003). However, Inkelas et al. (2008) state “there is limited national data ... and many campuses have scant local evidence about how their L/L [living-learning] programs affect student learning and outcomes” (pg. 498, emphasis in original). A further limitation of the existing literature is that most research has focused on a single type of living-learning program even through there is a wide variety of program models currently in practice (Inkelas et al., 2008).

This study took advantage of an opportunity to examine the comparative effectiveness of three different programs offered simultaneously on the same large, public, Midwestern, research-extensive university; each of these programs sought to improve first-year student learning and success. Two of these programs were variations of living-learning communities and the third was a First-Year Experience course. The purpose of this study was to determine if participation in these three transitional support programs (i.e., Academic Themed Floors, Freshmen Interest Groups, and First Year Experience courses) were related to first-year students earning higher grades and/or the likelihood that these students would persist into the sophomore year at this university.

INSTITUTIONAL PROGRAM DESCRIPTIONS

The First-Year Experience course (FYE course) at the institution studied is a two-credit, graded course typically coconstructed by two academic staff members (e.g., academic advisors, librarians). The course focuses on learning strategies, career and major exploration, diversity, money management, and other topics intended to help first-year students transition successfully into college life.

The institution also offers two types of living-learning programs. One form of living-learning program—Academic Theme Floors (ATFs)—are residence hall floors dedicated to an educational theme (e.g., service-learning) or academic disciplines (e.g., Nursing, Engineering), which house both first-year and continuing students. The communities range in size from a single floor of roughly 50 students to multiple floors of 300+. Some residence halls house multiple ATFs. Each ATF is designed and led by a group of faculty and academic support staff, residence life staff, and students. These living-learning programs do not offer courses, but rather focus on academically relevant out-of-class experiences. For example, bulletin boards focus on the most rel-
evant majors and the requirements needed to successfully declare those majors, and faculty from the interest area help to plan and then participate in programs (e.g., campus lectures, community dinners, social events, tours of relevant campus facilities) for students living in the ATF. There are also other, more subtle elements. Every residence hall floor in the entire housing system has an opening theme that ties together the name tags put on every resident’s door and the welcome posters and other messages hung throughout the community; however, as opposed to a general academic success message or institutional specific message, in the ATFs this opening theme is tied to a specific academic interest area (for example, an ATF focused on Journalism might have a ‘newspaper’ theme where each door has a name tag that looks a front page, the bulletin boards look like a copy-ready layout for a magazine spread, and the welcome poster says “Welcome to the Journalism Learning Community, where we help each other write our own success story!”).

The second form of living-learning program is the Freshmen Interest Group (FIG) program. FIGs are small groups of students (typically 15-25) who all live on the same residence hall floor and are enrolled together in four courses. In three of these courses the FIG students are in large sections of general education courses relevant to the theme of their FIG. The fourth course is a seminar limited to the students in a given FIG and designed to assist in the first-year transition process of those students. The FIG seminar is co-constructed by an advanced undergraduate student (who also serves as the student staff member on the residence hall floor on which the FIG students live) and a faculty member or academic affairs staff member. As with the first form of living-learning program described above, each FIG is built around an educational theme (e.g., Women in Science) or academic discipline (e.g., Nursing, Communication).

Inkelas, Soldner, Longerbeam, and Leonard (2008) have offered a very useful typology for categorizing living-learning programs grounded in the first National Study of Living Learning Programs (Inkelas & Associates, 2004). The typology is based on the structure of the living-learning program and consists of three categories. Type One consists of programs that were “Small, Limited Resourced, [and with a] Primarily Residential Life Emphasis” (Inkelas, et al., 2008). Type One programs tend to focus on the out-of-class experience, draw their budgets and administrative authority from student affairs, and seldom offer any form of academic coursework. This description is congruent with the ATFs offered on the campus being studied; as noted above, these focus on the out-of-class experience and do not offer courses.

The second form of living-learning program on the campus being studied, FIGs, appears to be most closely aligned with the description of Type Three which are “Large, Comprehensively Resourced, Student Affairs/Academic Affairs Collaboration[s]” (Inkelas et al., 2008). Type Three programs tend to be found at research institutions and exemplify a true collaborative effort of Academic and Student Affairs: budgets are jointly funded; leadership is shared; and students have access to a broad range of resources, programming, and the “largest number of course offerings and affiliated faculty” (Inkelas et al., 2008). This description is congruent with the FIGs program included in this study: it is jointly led by the Associate Dean of the College of Arts and Sciences and the Director of Housing; the budget is jointly funded by Academic and Student Affairs; it offers a wide range of resources and experiences; and it attempts to provide a true integration of the academic and residential experience.

First-year students are able to enroll in any combination of these three programs (i.e., ATF, FIG, and FYE) and all three of them are marketed to incoming students and their parents as opportunities to improve student learning and success. However, even though these programs are based on existing research (as are very similar programs on so many other campuses across the country), there is very little
research that compares these types of programs to see if they have similar effects on student learning and success. A brief summary of the literature is presented below.

**LITERATURE REVIEW**

The two most commonly used theories in studying academic performance and persistence are Astin’s (1993) Input-Environment-Outcomes (I-E-O) model and Tinto’s (1993) theory of voluntary student attrition. Astin’s (1993) model posits that student outcomes (O) are a function of the environments they experience (E) and their input characteristics (I). Astin notes that to understand why students remain enrolled, or earn grades that place them on academic probation, or achieve any other outcome one must take into account the entering characteristics of the students and what they experience during college.

Tinto’s (1993; 1997) theory contends that the decision to persist or leave an institution is not a one-time decision point; rather students are engaged in an on-going process of becoming more or less committed to an institution as a result of the degree to which they feel integrated into the academic and social systems of the institution. A variety of factors have been demonstrated to influence academic and social integration, and thus student departure, including: entering characteristics, goals and commitments, institutional experiences, quality of effort, and educational outcomes.

Tinto’s (1993) theory of voluntary student departure is an appropriate foundation for this study, not only because living-learning programs are intentionally designed to foster both academic and social integration (Inkelas & Wiesman, 2003; Inkelas & Associates, 2004), but also because there are real differences in how the three programs in this study seek to address factors relevant to academic and social integration. The FIGs program is designed to be a true blending of the academic and social worlds of first-year students; small groups of students live together and take almost all of their courses together. Students in the FYE course spend two hours a week together in a class focused primarily on supporting their academic transition, but there is little attempt to foster social integration outside of class. Students in the ATF live in a residential community intentionally designed to connect to — and reinforce—the academic experience, but they do not participate in a shared curricular experience. However, it should be noted that this study did not examine academic and social integration directly; rather, it focused on outcomes (i.e., grades and retention). Therefore, it is appropriate to consider other variables that have been demonstrated to affect academic performance and retention.

**Entering Student Characteristics**

After reviewing the literature on first-year student persistence, Ishler and Upcraft (2005) concluded that the most salient student entering characteristics are: prior academic achievement, sex, age, race/ethnicity, socioeconomic status, familial support, and initial commitment to obtaining a degree. For example, Astin (1997) concluded that “[f]our variables [student’s high school grades, admissions test scores, sex, and race] account for the bulk of the variance in retention that can be predicted from entering freshmen characteristics” (p. 649).

The student entering characteristic that has the most influence on retention is prior academic achievement (Ishler & Upcraft, 2005). The metrics typically used to measure prior academic achievement are standardized tests, and high school GPA (Astin 1993; Pascarella & Terenzini, 2005). Astin (1997) has suggested that of all the metrics readily available, high school GPA is the most useful in predicting retention; performance on standardized tests does not add much to what can already be predicted based on high school GPA. He found that high school GPA accounted for 8.6 percent of the variance in student retention, and that including SAT scores increased the amount of variance accounted for to just over
10 percent. Robbins, Lauver, Le, Davis, Langley, and Carlstrom (2004) conducted a meta-analysis of 109 studies and also found that high school GPA is a better predictor of persistence than standardized test scores.

Sex, race, and ethnicity are important entering characteristics. Persistence rates for female students tend to be higher than for male students (Astin, 1993; Ishler & Uppcraft, 2005). Although the role a student’s race and ethnicity plays in retention have been widely studied, the results to date have been difficult to interpret (Ishler & Uppcraft, 2005). Both Ishler and Uppcraft (2005) and Stage and Hossler (2000) find that racial and ethnic identity are very difficult variables to assess due to the confounding interactions that occur between them and many other variables. However, they do note that Black students who attend predominantly White institutions are typically less likely to be retained than their White peers at those same institutions or their peers at historically Black colleges and universities. Astin (1997) has found that sex only explains about two percent of the variance in retention, and race/ethnicity only explains another one percent of the variance.

Similarly, Stassen (2003) notes that the more academically successful a student is, the more likely he or she will persist.

The types of interactions first-year students have with their peers and faculty have been shown to affect persistence. Faculty-student interaction both inside and outside the classroom improves persistence is supported in the literature; more interaction and higher quality interaction foster retention (Cox & Orehovec, 2007; Pascarella & Terenzini, 1991, 2005). Similarly, peer-to-peer interaction—inside and outside the classroom—has a tremendous influence on learning and persistence (Astin, 1993, 1996; Pascarella & Terenzini, 1991, 2005). Astin (1996) states that first-year students who are “living at home, commuting, attending part-time, being employed off-campus, being employed full-time, and watching television” (p.126) are less likely to persist precisely because these activities cause them to interact less with their fellow students and with faculty members. Other elements of the college student experience, such as selecting a major (Astin, 1997), and joining a Greek organization (Tripp, 1997; Moore, Lovell, McGann & Wyrick, 1998) may also affect persistence.

### College Experiences

What a student experiences while in college also plays a role in persistence. The experiences that have been found to most powerfully influence first-year retention include: first semester academic performance, interaction with faculty and peers, initial major, financial aid, time commitments, satisfaction, campus climate, first-year experience courses, and living-learning communities. Academic performance (i.e., GPA) in the first semester (Belcheir, 1997) and subsequent semesters (Adelman, 2006) of college appears to be the best predictor of student persistence. Pascarella and Terenzini (2005) conclude that grades earned during the first year of college “may well be the single best predictors of student persistence” (p. 396), even after taking into account students’ entering characteristics.

### Effectiveness of FYE Courses and Living-Learning Programs

John Gardner, who developed the FYE course at the University of South Carolina in the late 1970s, recently claimed that FYE courses have been the most thoroughly and rigorously scrutinized college courses ever taught, and that the evidence gathered regarding their positive effect on first-year student persistence and academic achievement is undeniable (J. Gardner, personal communication, March 10, 2006). There is support within the literature to substantiate this claim (Uppcraft, Gardener, & Barefoot, 2005; Pascarella & Terenzini, 1991, 2005). However, there is also evidence to suggest that not all FYE courses have the same impact. While there are numerous conceptualizations of freshman year experiences or seminars, Ryan
and Glenn (2004), for example, studied two different First-Year Experience seminars being offered simultaneously on their campus; one focused on academic skill development or an integrated set of learning strategies, and transitional support while the other focused on integrating students into the academic community. All entering first-year students (n = 1499) were included in the study (77 students were in one course, 66 were in the other, and 1352 served as a control group). They found that students who took the course focused on academic skill development were retained at higher rates than those who took the course focused on integrating students into the academic community, even after controlling for entering characteristics (i.e., SAT score, high school percentile rank, sex, ethnicity).

A growing number of institutions are beginning to implement living-learning communities in an attempt to improve undergraduate education (Shapiro & Levine, 1999) based on a commonly held belief that taking a learning community and melding it into a residential setting will produce powerful benefits for students (Inkelas & Associates, 2004; Schroeder & Mable, 1994; Pike 1996, 1999; Pike, Schroeder & Berry, 1997). Gabelnick, MacGregor, Matthews, and Smith (1990) define a learning community as the “purposeful restructuring of the curriculum by linking courses that enroll a common cohort of students. This represents an intentional structuring of the students’ time, credit, and learning experiences to build community and foster more explicit connections among students, faculty, and disciplines (p. 5).” One of the more comprehensive reviews of the literature on learning communities was conducted by Lenning and Ebbers (1999) who determined

extensive documentary evidence suggests...benefits for students include higher academic achievement, better retention rates, greater satisfaction with college life, improved quality of thinking and communicating, a better understanding of self and others, and a greater ability to bridge the gap between academic and social worlds. (p. 6)

Additional studies have also found that compared to students who live off-campus or at home, students who live in residence halls are more satisfied with—and more involved in—the undergraduate experience, interact more frequently with faculty and staff, perform better academically, and are more likely to graduate (Pascarella, Terenzini & Blimling, 1994; Terenzini, Pascarella, & Blimling, 1999).

Inkelas and Weisman (2003) indicate that living-learning communities are intentional attempts by staff and faculty to foster the three types of involvement known to improve student achievement, namely “(a) involvement with academics (e.g., time spent studying, etc.), (b) involvement with faculty, and (c) involvement with student peer groups” (p.5). Initial research findings have tended to support the efficacy of living-learning communities; participating in them improves GPAs (Stassen, 2003), retention (Pike, 1999), involvement (Pike, 1999), satisfaction (Astin, 1993), student-faculty interaction (Pascarella, Terenzini & Blimling, 1994), and first-generation students’ social and academic transition to college (Inkelas, Daven, Vogt, & Leonard, 2006).

The National Study of Living-Learning Programs (Inkelas & Associates, 2004) is the first attempt to examine these programs on a national scale. Inkelas and her colleagues found that students in a residential learning community have more positive peer-to-peer interactions, perceive their residence halls to be more positive climates, and are more likely to be retained. Furthermore, these students report easier transition to college, higher academic achievement, higher levels of civic engagement, and lower levels of binge drinking.

While the characteristics of entering students are important, institutions can influence both the academic performance and retention of their students through influencing the college experience. Current literature would suggest that FYE courses, ATFs, and FIGs will have varying degrees of success in creating the conditions known to enhance student learning and retention (Astin, 1993, 1996; Tinto, 1993,
Examing the Academic Performance and Retention of First-Year Students

1997; Inkelas & Weisman, 2003; Stassen, 2003; Inkelas et al. 2008). Given the amount of resources being devoted to living-learning communities (Knight, 2003) and the largely unsubstantiated claims (Inkelas & Associates, 2004; Inkelas et al. 2008) higher educational administrators continue to make about the efficacy of these programs, it would be useful to find out the degree to which these programs improve academic performance and retention. The following section will provide the research methods and data analyses used in the study.

METHODS

The purpose of this study was to determine if participation in three programs (i.e., ATF, FIG, and FYE) were related to first-year students earning higher grades and/or increasing the likelihood that these students would persist into the sophomore year at the same institution. The following research questions were developed for this study: 1) After controlling for variables that the literature suggests affect academic performance (e.g., high school GPA, ACT score, sex, race, family income level, initial major, living arrangement, and Greek society membership), do first-year students who participate in an FIG, ATF, or FYE course earn higher GPAs compared to students in the other two programs or nonparticipants?, and 2) After controlling variables that the literature suggests affect retention (e.g., first-semester GPA, high school GPA, ACT score, sex, race, family income level, initial major, living arrangement, and Greek society membership), are first-year students who participate in an FIG, ATF, or FYE course more likely to re-enroll at the same institution for their sophomore year compared to students in the other two programs or nonparticipants?

Data Source

Data were gathered from the institutional records of a public, land-grant University in the Midwest with approximately 25,000 students. All first-year students who first matriculated during the fall 2003, 2004 or 2005 semesters were included in the study (n = 13,932), and were dummy coded to indicate if they had participated in a FIG, ATF or FYE course during their first semester. This study focused on the fall semester because the FIG program is not offered during the spring semester. Students could participate in more than one of these three programs during their first semester or choose not to participate in any of them, which results in the following percentages adding up to more than 100. Within this dataset 29.3 percent of the students had been in a FIG (n = 4,087), 52.1 percent had been in an ATF (n = 7,256), 6.2 percent had taken an FYE course (n = 858), and 41.3 percent had not participated in any of these three programs (n = 5755). Of those students who participated in the programs, 4,231 students were involved in one program, 3,868 attended two programs, and 78 were noted as being in all three programs. Students who are in all three programs means the student was in the FYE course, which comprises at-risk students.

Variables in the Study

The outcome (or dependant) variables in this study were academic performance and retention. Each student’s first-semester GPA was used as a proxy variable for academic performance. Students were also coded as being retained (1 = retained, 0 = not retained) if they were enrolled for classes on the 21st day of the fall semester following their initial fall semester. The average retention and first-semester GPA associated with each variable included in the study are presented in Appendix A.

Prior research has found that a number of student input characteristics and college experiences influence academic performance and persistence (Adelman, 2006; Ishler & Urcraft, 2005); therefore, data regarding high school GPA, ACT score, sex, Greek Society membership, living arrangement, race, initial major, and family income level were collected. Using a formula suggested by Astin (1997), high school GPA was transformed as follows: A =
8, A- = 7, B+ = 6, B = 5, B- = 4, C+ = 3, C = 2, D = 1. For the logistic regression model this same formula was used to transform each student’s first semester GPA. ACT scores were left in their original range as a continuous variable. The variables of sex (Female = 1, Male = 0), Greek Society membership (Greek = 1, non-Greek = 0), and living arrangement (residence hall = 1, other = 0) were dummy coded.

Due to the relatively small number of students of color in the sample, the racial demographic data provided by the institution was converted into three dummy variable categories, White, Black, and Other Under-Represented. Incoming students were enrolled in over 100 majors/premajors and one of 11 academic divisions. Therefore, students were assigned to one of the following seven categories and dummy coded appropriately: College of Business; College of Education; College of Engineering; Other Science Divisions; School of Journalism; College of Agriculture, Food, and Natural Resources; and College of Arts & Sciences.

Based on the review of the literature and their own research, St. John, Cabrera, Nora, and Asker (2000) suggest that financial variables (such as family income level and the amount and type of financial aid received) could explain almost half of the variance in student persistence. Given the potential importance of financial matters, data were obtained from the Office of Financial Aid regarding parent’s adjusted gross income for each student as reported on his or her Free Application for Federal Student Aid (FAFSA) form. Given that 33 percent of the cases were missing income data, an exploratory analysis was conducted to better understand this variable. Recoding income data into ordinal categories (i.e., missing, $1 to $20,000, etc.) revealed that income had a strong positive linear relationship to many other variables in the dataset such as high school GPA, ACT score, participation in a FIG, first-semster GPA, and one-year retention. The group of students for whom income was not provided was most similar to the highest income group. Therefore, the decision was made to include students who did not complete a FAFSA in the highest income group. Although this created a skewed variable, recoding “missing” into the highest income group appears to reflect most accurately the actual population and to relate linearly to first-semster GPA and retention as shown in Figure 1 and 2.

**Research Design**

Multiple regression was used to analyze the effect participation in ATFs, FIGs, and FYE courses had on first semester GPA after controlling for high school GPA, ACT score, sex, race, family income level, initial major, living arrangement, and Greek Society membership. The second model in this study used logistic regression to explain the effect that these independent variables listed above, as well as first-semster GPA, had on retention. Logistic regression allows a researcher to regress both categorical and continuous independent variables on a binary dependent variable, and thus is very appropriate for examining retention (Dey & Astin, 1993). Logistic regression computes the odds for a person in a given category (in this case the category of those who participated in a FIG, ATF, or FYE course) to be in either of the outcome conditions (in this case retained or not retained). The logistic coefficient (β) and the change in odds (Exp(β)) between each independent variable and the dependant variable have been reported. The Delta-P (Adelman, 2006; Peng, So, Stage, & St. John, 2002) was also calculated for those variables with statistically significant coefficients.

**RESULTS**

Using the variables listed above a multiple regression model was created that explained 38.6 percent of the variance in GPA students earned their first semester. The results of this are shown in Table 1 below. To better interpret the findings in the model, the standardized β of
each variable provides the amount of change in first semester GPA for every standard deviation of that variable (standardized $\beta$ of each variable * standard deviation of first semester GPA). For example, the standardized $\beta$ for high school GPA - transformed is .51, which indicates that as a student’s high school GPA increases by one standard deviation (1.530), a student’s first-semester GPA increases by .51 standard deviations if every other variable in this model is held constant.

High school GPA - transformed explained the most variance in this model (standardized $\beta = .51$, $p < .001$), followed by ACT score (standardized $\beta = .20$, $p < .001$). Although many of the remaining variables in the model had a statistically significant and positive effect on first-semester GPA, their effect sizes were small. For example, all other things being equal, for every $31,460 increase in family income (one standard deviation) students earn a 0.069 higher GPA. A student’s race had no practical significant effect on his or her first semester GPA.

Living in a residence hall (standardized $\beta = .05$) and joining a Greek organization (standardized $\beta = .08$) were both found to have a small, but statistically significant positive effect on first-semester GPA. Journalism was the only major positively associated with first-semester GPA. The largest effect was for students in Engineering, which had virtually the
same effect size (standardized $\beta = -0.09$) as family income and Greek Society membership, but in the opposite direction. A student’s gender did not influence GPA earned in the first semester.

A primary interest of the study was to ascertain if participating in a Freshman Interest Group, Academic Theme Floor, or First-Year Experience course affected first-semester GPA. After controlling for all independent variables in this study, students who participated in FIGs did earn higher grades (standardized $\beta = 0.02$, $p < 0.01$); students in ATFs and FYE courses did not. Although the difference for FIG students was statistically significant, this difference is extremely small. When all other variables in the model are held constant the average GPA of FIG students was 0.009 higher (beta * std. error = 0.02 * 0.455 = 0.009).

**First-Year Student Retention**

The second phase of this study used logistic regression to determine if, after controlling for the same variables used in the first model plus the covariable of first-semester GPA, participating in ATFs, FIGs and FYE courses increased the likelihood that a student would be retained into the sophomore year at the same institution. Collinearity tests revealed

| TABLE 1 |
|--------------------------|----------|-----------------|---------------|----------|
| Multiple Regression on First-Semester GPA |
|                        | B        | Std Error       | Standardized B | SD       |
| (Constant)              | -0.424   | 0.063           | .51***         | 1.530    |
| High School GPA–transformed | 0.28     | 0.004           | .51***         | 1.530    |
| ACT Score               | 0.05     | 0.002           | .20***         | 3.555    |
| Sex (female = 1)        | 0.02     | 0.013           | .01            | 0.499    |
| Family Income           | 0.04     | 0.004           | .08***         | 1.573    |
| Race                     |          |                 |                |          |
| Black                    | 0.86     | 0.041           | .03**          | 0.247    |
| White                    | -0.02    | 0.034           | -.00           | 0.351    |
| Other                    | -0.27    | 0.042           | -.00           | 0.217    |
| Greek Membership         | 0.16     | 0.015           | .08***         | 0.426    |
| Lived in Res. Hall       | 0.13     | 0.019           | .05***         | 0.345    |
| Program Participation    |          |                 |                |          |
| FIG                      | 0.04     | 0.015           | .02**          | 0.455    |
| ATF                      | -0.01    | 0.013           | -.00           | 0.500    |
| FYE                      | 0.01     | 0.025           | .00            | 0.240    |
| Initial Major            |          |                 |                |          |
| Agriculture              | -0.12    | 0.029           | -.04**         | 0.265    |
| Arts and sciences        | -0.05    | 0.023           | -.03*          | 0.466    |
| Business                 | -0.05    | 0.025           | -.02**         | 0.395    |
| Education                | -0.05    | 0.031           | -.02           | 0.233    |
| Engineering              | -0.28    | 0.029           | -.09**         | 0.285    |
| Journalism               | 0.06     | 0.025           | .03**          | 0.385    |

Note:  $R^2 = .386$.  *$p < .05$.  **$p < .01$.  ***$p < .001$. 

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that tolerances ranged from .598 to .993 and the variance inflation factor (VIF) ranged from 1.017 to 1.673, both of which indicate lack of collinearity. The model was able to correctly classify 96.4 percent of those retained and 44.3 percent of those who were not retained; 87.8 percent of the total dataset was correctly classified. Although the -2LL was fairly high (9204.977), the model appears to be moderately effective in predicting the intended outcome (Cox and Snell's $R^2 = .207$, Nagelkerke's $R^2 = .351$). The results of the model are shown in Table 2.

The results of logistic regression are expressed via the Exp(β) which is the change in odds for every unit increase in a given variable. When Exp(β) is equal to one, that variable does not change the odds (for this study, the odds of being retained). The larger Exp(β) is from one, the more the odds change in a positive direction. According to Field (2005), whenever the 95% confidence interval includes 1.00 there is cause for serious doubt whether that variable is having any effect and about the direction of that effect. The Delta-P is the percent of change in the probability of being retained associated with a one-unit change in each independent variable (Adelman, 2006) and was calculated only for statistically significant variables.

Although high school GPA was powerfully associated with first-semester GPA, it was negatively associated with retention (Exp(β) .95, p < .05, Delta-p -.01), and ACT score had no effect (Exp(β) 1.01, p > .05). Contrary to most research (Pascarella & Terenzini, 2005), being female also had a negative effect (Exp(β) .72, p < .001, Delta-p -.05) on retention. Family income had a statistically significant and positive relationship to retention, but again, the change in odds is very small (Exp(β) 1.08, p < .001, Delta-p .01). A more practical way to express this is to compute what a student's likelihood of being retained is at one income level and that likelihood if the student was at the next income level. Hypothetically, assume a student's likelihood of being retained is 60 percent (which would mean his or her odds of leaving are 40 percent). This could be expressed as an odds ratio of .60/.40. According to this logistic regression model, when a student comes from a family that earns one income level (for example $40-59,000), and another student identical in every other way comes from a family at the next higher income level ($60-79,000), the odds ratio is 1.082. The probability associated with income level is thus 1.62 (or .64 times 1.082). The new odds can then be found by solving for X in an odds equation (1.62 = x/(1-x)). If the odds for the first student were 60 percent, then the odds for the second student would be 61.9 percent. It is important to distinguish between the odds ratio (which is the change in the odds, reported in SPSS as “Exp(β)” and the actual odds (which in this example went up from a 60 percent chance to a 61.9 percent chance of being retained).

Being Black increased a student's odds of being retained (Exp(β) 1.90, p < .001, Delta-p .09). In fact, after all other variables in the study are taken into account, being Black almost doubled the odds of being retained, whereas the other racial categories in this study were not significant. Joining a Greek organization (Exp(β) 1.934, p < .001, Delta-p .09) also came close to doubling the odds of being retained, but living in the residence halls had no effect (Exp(β) 1.14, p > .05). Two categories of initial choice of academic major had a positive effect on retention: majors within the College of Agriculture, Food, and Natural Resources (Exp(β) 1.58, p < .001, Delta-p .04), and majors within the College of Business (Exp(β) 1.30, p < .001, Delta p .06).

First-semester GPA had the largest effect on retention compared to every other variable in the model. First-semester GPA was transformed according to Astin's (1997) formula and entered as a categorical variable using Reverse Helmert contrasts. This coding causes each level of the variable (other than the first level) to be compared to the average effect of the previous levels. Students who earned a D average were more than 10 times as likely to be retained (Exp(β) 10.64, p < .001, Delta-p
<table>
<thead>
<tr>
<th></th>
<th>B</th>
<th>Std. Error</th>
<th>Wald Statistic</th>
<th>Exp(β)</th>
<th>95% Confidence Interval for Exp(β)</th>
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<tr>
<td>(Constant)</td>
<td>.878</td>
<td>.291</td>
<td>9.10</td>
<td>2.41**</td>
<td>Lower: .910  Upper: .993</td>
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<tr>
<td>High School GPA - Transformed</td>
<td>-.050</td>
<td>.022</td>
<td>5.07</td>
<td>.95*</td>
<td>Lower: .991  Upper: 1.028</td>
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<tr>
<td>ACT score</td>
<td>.010</td>
<td>.009</td>
<td>1.01</td>
<td>1.01</td>
<td>Lower: .868  Upper: 1.661</td>
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<tr>
<td>Sex (Female = 1)</td>
<td>-.334</td>
<td>.065</td>
<td>26.73</td>
<td>.72***</td>
<td>Lower: .631  Upper: .813</td>
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<tr>
<td>Family Income</td>
<td>.079</td>
<td>.018</td>
<td>20.13</td>
<td>1.08***</td>
<td>Lower: 1.045  Upper: 1.119</td>
</tr>
<tr>
<td>Race</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>.183</td>
<td>.166</td>
<td>1.22</td>
<td>1.20</td>
<td>Lower: .868  Upper: 1.661</td>
</tr>
<tr>
<td>Black</td>
<td>.640</td>
<td>.197</td>
<td>10.54</td>
<td>1.90***</td>
<td>Lower: 1.288  Upper: 2.790</td>
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<tr>
<td>Other</td>
<td>.362</td>
<td>.201</td>
<td>3.25</td>
<td>1.44</td>
<td>Lower: .969  Upper: 2.128</td>
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<tr>
<td>Greek Society Membership</td>
<td>.659</td>
<td>.078</td>
<td>70.80</td>
<td>1.93***</td>
<td>Lower: 1.658  Upper: 2.255</td>
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<tr>
<td>Lived in Res. Hall</td>
<td>.130</td>
<td>.091</td>
<td>2.04</td>
<td>1.14</td>
<td>Lower: .953  Upper: 1.360</td>
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<td>Initial Major</td>
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<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Education</td>
<td>-.163</td>
<td>.141</td>
<td>1.32</td>
<td>.85</td>
<td>Lower: .664  Upper: 1.121</td>
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<td>Engineering</td>
<td>.207</td>
<td>.140</td>
<td>2.168</td>
<td>1.23</td>
<td>Lower: .934  Upper: 1.619</td>
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<td>.107</td>
<td>.094</td>
<td>.97</td>
<td>Lower: .784  Upper: 1.194</td>
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<td>.018</td>
<td>.897</td>
<td>.90</td>
<td>Lower: .711  Upper: 1.126</td>
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<td>Agriculture</td>
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<td>.147</td>
<td>9.707</td>
<td>1.58***</td>
<td>Lower: 1.185  Upper: 2.109</td>
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<tr>
<td>First-Semester GPA - Transformed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>D vs. lower</td>
<td>2.364</td>
<td>.239</td>
<td>97.58</td>
<td>10.64***</td>
<td>Lower: 6.653  Upper: 17.001</td>
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<tr>
<td>B- vs. lower</td>
<td>2.359</td>
<td>.108</td>
<td>481.32</td>
<td>10.58***</td>
<td>Lower: 8.571  Upper: 13.065</td>
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<td>B vs. lower</td>
<td>2.148</td>
<td>.095</td>
<td>507.65</td>
<td>8.57***</td>
<td>Lower: 7.110  Upper: 10.333</td>
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<tr>
<td>A vs. lower</td>
<td>1.739</td>
<td>.140</td>
<td>154.03</td>
<td>5.69***</td>
<td>Lower: 4.325  Upper: 7.490</td>
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<td>Program Participation</td>
<td></td>
<td></td>
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<td>FIG</td>
<td>.165</td>
<td>.071</td>
<td>5.37</td>
<td>1.18*</td>
<td>Lower: 1.026  Upper: 1.356</td>
</tr>
<tr>
<td>ATF</td>
<td>-.071</td>
<td>.064</td>
<td>1.22</td>
<td>.93</td>
<td>Lower: .821  Upper: 1.057</td>
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<tr>
<td>FYE</td>
<td>.062</td>
<td>.116</td>
<td>.29</td>
<td>1.06</td>
<td>Lower: .848  Upper: 1.335</td>
</tr>
</tbody>
</table>

Note: Cox & Snell $R^2 = .207$, Nagelkerke $R^2 = .351$; -2 Log Likelihood = 9,204.977.
*p < .05, **p < .01, ***p < .001.
found that high school GPA and ACT scores predicted retention more than any other input characteristic, this study found high school GPA was slightly negatively associated with retention and that ACT score was not related to retention in a statistically significant manner. The current study takes into account a different set of variables than those Astin used, but since it is limited to one institution and the effect size of high school GPA on retention was negligible, one must be cautious about reading too much into this finding.

Within this sample, both joining a Greek organization and being Black almost doubled the odds of being retained. Previous research suggests the former finding (Tripp, 1997), but not the latter, especially considering these data were gathered from a predominately White institution (Stage & Hossler, 2000). A part of the explanation for these conflicting findings may be that Black students cannot join historically Black Greek organizations during their first semester on the campus where these data were gathered (J. Basler, personal communication, April 7, 2006). While the effect of being in a Greek organization was taken into account for other racial groups, it was not controlled for among Black students (unless they joined a historically White or another type of Greek organization). However, a more likely possibility is that once the other variables included in this study are taken into account (e.g., high school GPA, family income, first-semester GPA) there is another variable unaccounted for in this study that increases the odds of a Black student persisting. For example, it may be that the Black students in this study have had to overcome greater adversity than students in the other racial groups and are thus more motivated to persist. Both Ishler and Upcraft (2005) and Stage and Hossler (2000) point out that racial and ethnic identity are very difficult variables to assess due to the confounding interactions that occur among them and many other variables. The findings of this study support that idea. As detailed in Appendix A, Black student retention (80%) was lower than White student retention (84%), but
this logistic regression suggests that there are other variables which are impacting this difference in retention rates.

The results of this study indicate that after controlling for the entering and environmental characteristics included in the study, FIG students achieved statistically significant higher academic performance. However, improving a student’s GPA by .009 does not seem to be of practical significance. Participating in an ATF or FYE course did not have any effect (positive or negative) on first-semester GPA. This finding is in line with prior research (Tinto & Goodsell-Love, 1993; Stassen, 2003), which has attributed higher GPAs to participation in a FIG. Prior research has also found that FYE courses (Barefoot, 2000; Ishler & Upcraft, 2005) are associated with higher grades; however, this study did not support those findings.

One of the primary foci of this study was to determine if participating in an FIG, ATF or FYE improved retention. Only one of these three programs, FIGs, was found to improve retention; participating in an FIG increased the odds of being retained by 18 percent, but no affect was found for the ATF or FYE programs. Given the profound impact of first-semester GPA on retention in this study, it is also noteworthy that participating in a FIG did not have a meaningful effect on first-semester GPA and yet retention was still improved. This suggests that participating in the FIG provides some additional boost to persistence beyond that which would come from higher first-semester GPA alone. This finding adds additional credence to prior research which has also demonstrated that students in FIGs are more likely to be retained (Marerro & Beckett, 2005; Stassen, 2003; Lenning & Ebbers, 1999; Pike, 1999). The lack of affect for ATF and FYE on retention contradicts previous research (Pascarella, Terenzini, & Blimling, 1994; Ryan & Glenn, 2004; Ishler & Upcraft, 2005; Pascarella & Terenzini, 2005).

This study cannot provide conclusive evidence as to why participating in a FIG improved the odds of being retained, but the existing literature suggests some very likely reasons. As previously mentioned, we know the importance of students interacting with other students and with faculty (Tinto, 1993; Astin, 1996; Pascarella & Terenzini, 1991, 2005). There can be little doubt that participating in an FIG fosters daily interaction among students, but perhaps just as important, the students in each FIG begin their relationships on the basis of a shared academic interest. That might be the whole explanation, but another possibility exists. Each FIG seminar is co-constructed by an academically successful advanced undergraduate student and a faculty member who also have the same shared academic interest. Cox and Orehovec (2007) have recently demonstrated the importance of the quality of interaction between students and faculty. They have found that even in a residential college intentionally designed to foster student-faculty interaction outside the classroom, very little of this interaction actually occurred. Looking at the design of the three programs in this study one can conclude that, compared to ATFs and the FYE courses (which are usually not taught by faculty), the FIG structure facilitates more faculty-student interaction. Perhaps the FIG structure also improves the quality of faculty-student interaction, for again these faculty-student relationships start not only with a shared academic interest, but also in a well-defined space with which faculty and students are familia—the classroom. Additional interactions (e.g., field trips, campus events, social events on the residence hall floor) can then flow naturally from this constant and predictable space.

The FIG program on the campus from which these data were collected seeks to create a “seamless connection” (Kuh 1996) between the out-of-class residential experience and the in-class academic experience. As described previously, students in the FIG program take four courses together (three general education courses and a seminar course) and live with each other and the peer advisor who co-constructs the small seminar. Students in the ATF
live on the same floor and have shared academic interests, but do not have a shared curricular experience. Students in the FYE course do not live together and have no commonality other than the shared experience of being a first-year student taking that course. Although this study does not measure the degree to which FIGs, ATFs and FYE courses integrate the in-class and out-of-class experience, the program structures themselves suggest that they provide different levels of integration. Minimally, this study provides evidence that first-year student retention can be improved by housing students together common academic interests and a shared curricular experience; simply housing students with shared academic interest together without a curricular component did not improve retention.

Recently, Pike (2008) reminded us of the importance of peer-to-peer interaction and suggested that one of the reasons learning communities are associated with positive outcomes is that they improve the quantity and quality of student’s interactions with one another. Perhaps this is observable in the results of this study as well. Living together and taking four courses together would likely foster more interaction than simply living together in an ATF or taking an FYE course. At this point, this is simply conjecture. Additional research into why participating in FIGs improves a student’s odds of being retained is needed.

LIMITATIONS

As pointed out by Inkelas et al. (2008), one of the difficulties researchers face when studying living-learning programs is the variability of these programs from campus to campus. Although this study avoids that difficulty by focusing on one campus that has two different types of living-learning programs, the limited focus also creates a weakness inherent in a single-institution study. Furthermore, it should also be recognized some students in the FYE course were also in a FIG or ATF, and most students, but not all, who were in a FIG also lived on an Academic Theme Floor. While this may create a slightly confounded variable, we found that only 78 students were in all three programs. Students who participated in all three programs mean that the student was in the FYE course, which we know to be heavily weighted with at-risk students.

Another limitation to this study is the lack of random assignment. As mentioned earlier, students (or perhaps in some cases, their parents) request specific FIGs, ATFs and/or an FYE course. Incoming students also had the option to request being assigned to any relevant FIG if the ones they had requested were full. Therefore, it must be acknowledged that there is an element of self-selection in this study regarding participating in a FIG, ATF, FYE or none of these programs. That being said, the relatively large number of first-year students who participate in FIGs and ATFs, and the fairly rigorous nature of logistic regression combined with the previously established importance of the control variables included in this study, suggest that the improved retention rates associated with FIGs are not merely the result of self-selection.

There are many different themes among the ATFs and FIGs on the campus being studied. These themes range from specific foci, such as “nursing” or “preveterinary medicine,” to broader foci, such as “leadership” or “international floor.” Each ATF also has educational goals (e.g. clarifying major selection, orientation to relevant practicum and curricular structures, developing leadership skills, learning about other cultures) that vary across the program. Combining all ATFs and all FIGs into one variable masks the effect any individual ATF or FIG might have on GPA and retention. Additional research in which ATFs and FIGs are considered individually or in closely matched subsets would be beneficial. Moreover, it would be interesting to follow this study with one that examines the variance between FIGs.
CONCLUSION

Retaining first-year students is far from a laudable goal. In fact John Gardner (March 10, 2006) reminds us that retention is simply a lack of student failure when he refers to it as "merely the [student's] ability to fog a mirror"; student learning and success are our goals. The results of this study contribute to the small, but fairly consistent body of research regarding the efficacy of residential FIG programs in improving student retention. This study also draws into question the benefits students gain from participating in an Academic Theme Floor or FYE course offered on the campus these data were collected from. Therefore, a more nuanced examination is required before we can safely conclude what is or is not working, and why.

This study reinforces the research that suggests that student affairs' practitioners and faculty members will influence student learning and success by working together to develop living-learning programs—such as residentially-based FIGs—that have a curricular component, as well as by fostering student interaction with peers and faculty members who share academic interests.

Acknowledgment: A previous version of this paper was presented at the annual meeting of the Association for the Study of Higher Education.

APPENDIX

First Semester GPA and Retention

<table>
<thead>
<tr>
<th>Family Income</th>
<th>1st Semester GPA</th>
<th>Retained</th>
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<tbody>
<tr>
<td>$1-20K</td>
<td>2.52</td>
<td>74.1%</td>
</tr>
<tr>
<td>$21-40K</td>
<td>2.68</td>
<td>79.8%</td>
</tr>
<tr>
<td>$41-60K</td>
<td>2.73</td>
<td>81.2%</td>
</tr>
<tr>
<td>$61-80K</td>
<td>2.82</td>
<td>82.2%</td>
</tr>
<tr>
<td>$81-100K</td>
<td>2.86</td>
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</tr>
<tr>
<td>&gt;$101</td>
<td>2.84</td>
<td>85.6%</td>
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</table>

<table>
<thead>
<tr>
<th>Initial Major</th>
<th>1st Semester GPA</th>
<th>Retained</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arts &amp; Sciences</td>
<td>2.74</td>
<td>81.0%</td>
</tr>
<tr>
<td>Agriculture</td>
<td>2.83</td>
<td>87.0%</td>
</tr>
<tr>
<td>Business</td>
<td>2.70</td>
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<tr>
<td>Education</td>
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<tr>
<td>Engineering</td>
<td>2.69</td>
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<tr>
<td>Journalism</td>
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<td>85.5%</td>
</tr>
<tr>
<td>Other Science</td>
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<td>84.8%</td>
</tr>
<tr>
<td>Greek Society</td>
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<td>90.8%</td>
</tr>
<tr>
<td>Membership</td>
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<tr>
<td>Lived In Hall</td>
<td>2.84</td>
<td>83.9%</td>
</tr>
<tr>
<td>Program</td>
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<tr>
<td>Participation</td>
<td>2.94</td>
<td>86.3%</td>
</tr>
<tr>
<td>FIG</td>
<td>2.87</td>
<td>84.4%</td>
</tr>
<tr>
<td>ATF</td>
<td>2.46</td>
<td>80.4%</td>
</tr>
<tr>
<td>FYE</td>
<td>2.74</td>
<td>82.6%</td>
</tr>
<tr>
<td>No Program</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total of All Students</td>
<td>2.80</td>
<td>83.6%</td>
</tr>
</tbody>
</table>

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ences and persistence. *Journal of College Student Development.* 38, 609-621.
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Measuring the impact of a university first-year experience program on student GPA and retention

Eric Jamelske

Published online: 13 July 2008
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Abstract In 1997 a medium-size Midwestern public university in the U.S. initiated a first year experience program. The program is designed to infuse added curricular and extra-curricular components into core courses in an effort to integrate students into the university community. This article examined the FYE impact on grade point average (GPA) and retention after 1 year for the fall 2006 cohort of entering students. The findings suggest no positive FYE effect on retention, but on average FYE students earned higher GPAs than non-FYE students. Reducing the sample to include only courses identified as goal compatible FYE courses yielded a positive effect on retention and also accentuated the GPA differential. The estimated positive FYE impact on retention was larger for below average students (especially females) and smaller for above average students.

Keywords Higher education · First year experience · Retention · Grade point average

Introduction

Background

As a college degree has become increasingly necessary for young adults to be competitive in the job market, more students are pursuing a higher education. Institutions now enroll many students who would not have attended college in the past. Consequently, many students have needs which require a range of support programs. In addition, most colleges and universities are operating with tightened budgets. Under these circumstances student retention and graduation have become increasingly important.

In 2007 the average retention rate among all U.S. institutions of higher education from first year to second year was 68.7%. Within this national average, retention was significantly lower among 2 year schools compared to 4 year schools. Similarly, retention at
4 year private institutions was somewhat higher than at 4 year public institutions. See Appendix A for a more detailed look at retention rates across institution types (ACT 2007). Given that students cannot graduate if they are not retained early on, student retention has become one of the most analyzed outcomes in higher education.

From the student perspective retention is important for the simple reason that college pays. In 2003 the median annual salary in the U.S. was $30,800 for a worker with only a high school diploma. This was significantly lower than the median earnings of $49,900 for those with a bachelor’s degree (The College Board 2005). Moreover, lifetime earnings for someone with a bachelor’s degree were estimated to be nearly twice that of someone with only a high school diploma (Day and Newburger 2002). Retention is also important to institutions, not surprisingly because it pays. Students are the financial lifeline of colleges and universities through the tuition and fees as well as government subsidies for public institutions. A low retention rate means that a college is always working to replace students that leave which requires resources that could be used elsewhere. In addition, if students leave before graduating, they are not likely to become donors to their former schools.

Retention and recruitment are closely related as the competition for the best students has increased recently. Students and parents are becoming reliant on highly publicized national and regional higher education rankings in choosing institutions. One such publication is the annual U.S. News and World Report on College Rankings. In this report, an institution’s retention rate carries a weight between 20 and 25% in the ranking process (U.S. News & World Report 2008). Therefore, higher retention rates improve national and regional rankings and are therefore extremely important to recruitment efforts (Porter and Swing 2006). The irony is that the better students a university recruits, the more likely they are to have a high retention rate. However as pointed out above, the higher an institution’s retention rate is, the more competitive they will be in recruiting top students.

In response to these challenges many institutions have begun to allocate significant resources to the first year experience in an effort to improve student outcomes. First year experience (FYE) programs vary widely across institutions ranging from highly organized learning communities to basic courses introducing students to college life. Although there is a growing literature on the evaluation of FYE programs, the results are mixed. This is because each analysis is specific to the particular institution, student body and program under study. There are significant differences between public and private colleges, between large and small colleges, and between those that focus on teaching as opposed to research. Some campuses are urban while others are suburban or rural and some have significant on campus housing while others do not. In summary, both the institutional characteristics and the types of FYE programs being implemented vary greatly.

In 1997 one particular medium-size Midwestern public university in the U.S. initiated a FYE program. The program was designed to add both curricular and extracurricular components to existing core courses in an effort to integrate students into the university community. There has never been an organized and thorough evaluation of this FYE program. Past assessments were incomplete and consisted mainly of qualitative data from student surveys. These data show that students generally responded positively about their FYE course experience, but this is not enough to justify the resources devoted to this program over the last decade. Specifically, the fall 2006 FYE budget was $237,700. Given this major expenditure and lack of information on program outcomes, university administrators called for a detailed program assessment. The research presented in this article is the first step in developing an on-going assessment of this university’s FYE program. Although a complete benefit-cost analysis is beyond the scope of this paper, a detailed investigation of program cost effectiveness is planned for future research.
This study used both student and faculty survey data and administrative data to measure the impact of this FYE program on student GPA and retention after 1 year for the fall 2006 cohort of entering students. The FYE impact was also analyzed separately for different subgroups. The results of this study are integral in developing a successful, cost effective FYE program at this institution. Moreover, this research adds to the growing literature on student outcomes associated with first year interventions in higher education. This paper analyzes the experience of one Midwestern U.S. institution and most of the background information is also specific to the U.S. However, the first year experience has become a significant focus of institutions around the world.

The National Resource Center for the First Year Experience (http://www.sc.edu/fye/) hosts an annual International Conference now in its twenty-first year. The nineteenth annual conference in Toronto had nearly 500 participants from 17 different countries with featured speakers from 11 different countries. The attendance at this event represents only a fraction of the international interest and attention surrounding first year intervention programs. This suggests that the global demand for research results identifying FYE best-practices is very high. Because all institutions and programs are different, results from specific institutional case studies may not generalize to all universities. However, research results such as presented in this article are still valuable to institutions in a wide variety of countries that are seeking to either begin a FYE program or improve an existing one.

Literature review

First year interventions have grown dramatically in the last two decades with approximately 95% of U.S. 4-year institutions having some type of program. Although program content varies greatly, there are many common elements. Most programs serve, at least in part, as an extended orientation and are often referred to as an introduction to university course or a first year seminar. Some institutions go even further by arranging learning communities for incoming students where small groups of students take a series of linked courses in their first semester or the first year. In some cases the learning communities are based on disciplinary themes or linked to residence halls and can encompass the students’ entire class schedule. The more basic FYE courses generally have a regular class meeting time with a specific instructor or team of instructors and are credit bearing and graded. They usually include activities and resources designed to introduce new students to university life and assist with time management and study skills. Although many courses include a discipline or specific academic component in addition to the activities above, the variation in pedagogy and structure is significant across campuses. However, all programs site the primary goals of increased student performance, persistence and graduation by integrating students into the university community both academically and socially (Pas- carella and Terenzini 2005; Tobolowsky et al. 2005; Goodman and Pascarella 2006).

The research examining the success in achieving these stated goals has grown over the last decade. An exhaustive review of this literature including recommendations for future research can be found in How College Effects Students (Pascarella and Terenzini 2005). The most common variables studied have been GPA, retention, graduation and self-reported student satisfaction. Most research has focused on retention over the first year because the majority of dropouts occur during the first year (Tinto 1987; Barefoot 2000). In 15 of 23 years studied, University of South Carolina-Columbia researchers found that first year seminar students were more likely to return for their sophomore year than non-participants. Several other studies have found similar retention effects, however Pascarella...
and Tarenzini (2005) caution that many of these studies do not use random samples or control for student pre-college characteristics.

Two studies were identified with highly rigorous analyses. The first study used matched control groups and found that program students were seven percentage points more likely to be retained for their second year. The second study used a random assignment of students and found that participating students were 13 percentage points more likely to return for their second year (Pascarella and Terenzini 2005; Goodman and Pascarella 2006). Several other studies are particularly relevant to the analyses presented in this paper.

In a longitudinal analysis of matched treatment and comparison groups, Schnell and Doetkott (2002–2003) found significantly higher retention rates for first year seminar students over a 4 year period at a medium-size Midwestern public university. Hotchkiss et al. (2006) found first year learning communities had a small positive effect on retention and GPA at a large Southern public institution, however controlling for selection bias increased this effect especially among male and female black students. Fidler and Moore (1996) found significant positive effects on retention for both first year seminar attendance and residing on-campus over the period 1986–1993. They concluded that the lowest dropout rates occurred among students who combined both of these experiences.

There are also several examples of FYE programs found to have little or no benefit to students. Potts et al. (2003–2004) found no consistent positive effects on retention or GPA for students who participated in an incoming cohort group. They did note that cohort groups had some positive influence for students entering college at risk. Crissman (2001–2002) did not find any added positive influence on retention rates from linking the first year seminar with an English composition class at a small Northeastern liberal arts college. Hendel (2006–2007) reports no effect of first year seminar participation on overall student satisfaction or 1-year retention in an analysis at a large urban research institution.

Overall, the evidence suggests that students involved in some type of organized first year intervention report higher levels of satisfaction and involvement in campus activities, achieve higher grades and are more likely to be retained and graduate. Given these mixed research findings, it is clear that a better understanding is needed of how these programs positively influence students. Pascarella and Terenzini (2005) recommend continued use of matching controls and random assignment experiments. They also suggest the most important next step is to incorporate a longitudinal design in order to better understand the long-term impact of first year program participation. It is important to once again note that the programs mentioned above vary across institutions in significant ways despite often being referred to as first year seminars. Moreover, the institutions themselves also vary in many ways and therefore positive/negative results from one study do not necessarily generalize to all institutions especially internationally.

FYE program description

This institution is a public comprehensive university located in a small urban setting in the upper Midwest. The university offers 80 bachelor’s degree programs and 14 master’s degree programs across a wide range of disciplines. There are 408 full-time faculty members and the average class size is 28 students, however introductory classes often have 50–75 students. The student body is very traditional in the sense that few students are returning to college or starting college after an extended absence from educational activities. Students on this campus are also racially homogeneous with over 92%
identifying as white. Lastly, the campus houses approximately 4,000 out of just over 10,000 total students in 11 residence halls including over 92% of all first year students.

During the fall of 1997 this university began its FYE program offering 50 sections of FYE courses, enough for about half of the entering class. The number of FYE courses was increased to 100 in the fall of 1998, making the classes available to more than 90% of new students. Since 1998 about 85% of all incoming students have enrolled in 80–95 FYE classes each year. Table 1 lists the 85 FYE course sections taught during the fall 2006 semester illustrating the wide variety of course offerings.

The stated goal of this program is to enhance the quality of the first year experience and contribute to student success across the domains of learning, satisfaction and retention. The

### Table 1 Fall 2006 first year experience courses

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>BIOL 100: General Biology (2)</td>
</tr>
<tr>
<td>BIOL 110: Ecology and Evolution (2)</td>
</tr>
<tr>
<td>CJ 202: Speech and Fundamentals</td>
</tr>
<tr>
<td>CSD 150: Introduction to Communication Science Disorders</td>
</tr>
<tr>
<td>ECON 103: Principles of Microeconomics (3)</td>
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<tr>
<td>ECON 104: Principles of Macroeconomics (2)</td>
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<td>ENGL 110: Introduction to College Writing (33)</td>
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<tr>
<td>ENGL 125: English Grammar and Usage</td>
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<tr>
<td>ENGL 150: Introduction to Literature (2)</td>
</tr>
<tr>
<td>ENGL 181: Introduction to Film (2)</td>
</tr>
<tr>
<td>ENGL 210: Introduction to Texts</td>
</tr>
<tr>
<td>ENGL 220: Introduction to Creative Writing</td>
</tr>
<tr>
<td>GEOG 111: Human Geography</td>
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<tr>
<td>GEOL 110: Physical Geography</td>
</tr>
<tr>
<td>HIST 101: History of Western Civilization to 1660</td>
</tr>
<tr>
<td>HIST 201: History of the US to 1870</td>
</tr>
<tr>
<td>HIST 205: American Women’s History</td>
</tr>
<tr>
<td>IDIS 100: Introduction to Social Work</td>
</tr>
<tr>
<td>MATH 109: Algebra for Calculus (4)</td>
</tr>
<tr>
<td>MATH 114: Calculus One (2)</td>
</tr>
<tr>
<td>MATH 246: Elementary Statistics</td>
</tr>
<tr>
<td>PHIL 101: Basic Philosophical Issues</td>
</tr>
<tr>
<td>PHYS 100: Physical Science</td>
</tr>
<tr>
<td>PHYS 211: General Physics</td>
</tr>
<tr>
<td>PHYS 231: University Physics One (2)</td>
</tr>
<tr>
<td>PSYC 101: Psychology as a Discipline and Profession (4)</td>
</tr>
<tr>
<td>RELS 100: World Religions (4)</td>
</tr>
<tr>
<td>SOC 101: Introduction to Sociology (2)</td>
</tr>
<tr>
<td>SPAN 101: Beginning Spanish One</td>
</tr>
<tr>
<td>SPAN 102: Beginning Spanish Two</td>
</tr>
<tr>
<td>SPAN 201: Intermediate Spanish One</td>
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<td>SPAN 202: Intermediate Spanish Two</td>
</tr>
<tr>
<td>WMNS 100: US Women’s Experience: Gender, Race and Class (2)</td>
</tr>
</tbody>
</table>

**Note:** A total of 85 FYE sections taught by 62 different instructors were offered during the fall 2006 semester. The majority of these courses had 20 students enrolled. HIST 205 is cross listed as WMNS 205
program was designed to strengthen the connection to the university by providing opportunities for students to interact with a small group of peers as well as work closely with an individual faculty member including both in-class and out-of-class activities. The published program goals have been divided into formal and informal goals.

Formal FYE program goals:
- Introduce students to a liberal education and to awaken intellectual curiosity.
- Enhance skills needed for academic success: reading, writing, speaking, listening, thinking, inquiry and analysis, use of information technology, library skills, and time management.
- Strengthen student connections to the University.
- Engage students in meaningful academic and non-academic out-of-class activities.
- Enhance student accountability for their education.

Informal FYE program goals:
- Encourage academic and social ties and connections to a faculty member.
- Provide a setting where connections can be made with peers in an educational learning community.

The intended design of this program was to infuse core courses with added curricular and extracurricular activities to integrate students into the university community. Enrollment is capped at 20 students and each course has an assigned student peer mentor. Curricular activities that could be added include service learning, field trips, group research or attending speaker events as well as special lectures and exercises in time management, study skills or library and technology use. Ideally the student peer mentor would play an active role in these activities assisting the new students as they adjust to their new academic environment. As can be imagined some courses would be more adaptable to this framework given the topical material and course design. Another restriction comes from the fact that many instructors teach both FYE and non-FYE sections of the same course.

Because all sections earn three credits they must cover the same basic material and grades must be determined on comparable assignments and exams. From a student incentive perspective, the additional activities mentioned above should be tied to the student’s course grade, but should complement the existing course content rather than replace it. Lastly, the program design suggests that faculty and student mentors engage the students in a variety of activities outside of class such as visiting career services, attending majors fairs, study abroad fairs or campus organizations fairs in addition to social events like picnics, playing or watching sports or just congregating socially.

This design presented a challenge to professors because of the significant work needed to integrate these curricular additions without compromising the original course. In addition, the suggested outside time commitment for extracurricular activities was also a major hurdle for FYE faculty to overcome. Although there were faculty and peer mentor training workshops to facilitate this process, these sessions have been extremely informal and because attendance is voluntary many instructors and mentors have chosen not to attend. Although FYE faculty are given guidelines and encouraged to meet the goals of the program as defined above, there are no specific rules or procedures to hold instructors accountable for doing so. These combined factors created a lack of uniformity across courses and instructors in how FYE classes were organized and taught. Lastly, there was no formal application process for selecting FYE faculty, and neither the individual departments nor the university place added value on performance reviews for teaching FYE. This issue is extremely important and is therefore discussed in greater detail below.
Method

Participants

Table 2 presents a summary of the incoming class for the fall 2006 semester. All of these data were obtained from the Office of the Registrar under approval from the Institutional Review Board (IRB). Out of 2,026 total students our final sample of 1,997 includes only full time students (enrolled in at least nine credits) under 20 years of age who remained enrolled at least through the first 2 weeks of the fall semester. The sample was 40% male, 92.6% white and the average age was 18.6 years old. Within the sample, 15.7% of the students were low income and 42.3% were first generation college students. The average high school class size among the sample was approximately 300 students and the average

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male indicator</td>
<td>Gender: 1 = male, 0 else</td>
<td>0.40</td>
<td>0.490</td>
</tr>
<tr>
<td>White indicator</td>
<td>Race/ethnicity: 1 = white, 0 else</td>
<td>0.926</td>
<td>0.261</td>
</tr>
<tr>
<td>Age years</td>
<td>Age in years</td>
<td>18.6</td>
<td>0.335</td>
</tr>
<tr>
<td>Low income</td>
<td>Low income: 1 = yes, 0 else</td>
<td>0.157</td>
<td>0.364</td>
</tr>
<tr>
<td>First generation</td>
<td>First generation college: 1 = yes, 0 else</td>
<td>0.423</td>
<td>0.494</td>
</tr>
<tr>
<td>High school size</td>
<td># of students in high school graduating class</td>
<td>300.4</td>
<td>173.7</td>
</tr>
<tr>
<td>High school rank</td>
<td>High school class rank in percent</td>
<td>75.5</td>
<td>13.98</td>
</tr>
<tr>
<td>Act score</td>
<td>Act exam composite score</td>
<td>24.3</td>
<td>2.87</td>
</tr>
<tr>
<td>English placement</td>
<td>English placement exam score: score range of 150–850</td>
<td>520.9</td>
<td>76.4</td>
</tr>
<tr>
<td>Math placement</td>
<td>Level of math placement: 1, 2 = remedial; 3, 4 = average; 5, 6, 7 = pre-cal, calculus</td>
<td>4.25</td>
<td>1.25</td>
</tr>
<tr>
<td>Beginning credit</td>
<td>Enter with exam or transfer credit: 1 = yes, 0 else</td>
<td>0.421</td>
<td>0.494</td>
</tr>
<tr>
<td>Orientation time</td>
<td>Time of summer orientation: 1 = 1st week, 2 = 2nd week, 3 = 3rd week, 4 = August</td>
<td>1.99</td>
<td>0.874</td>
</tr>
<tr>
<td>Undeclared</td>
<td>Undeclared major fall 2006: 1 = yes, 0 else</td>
<td>0.254</td>
<td>0.435</td>
</tr>
<tr>
<td>On campus</td>
<td>Lived in dorm fall 2006: 1 = yes, 0 else</td>
<td>0.925</td>
<td>0.264</td>
</tr>
<tr>
<td>Fall credits</td>
<td># of enrolled credits fall 2006</td>
<td>15.1</td>
<td>1.21</td>
</tr>
<tr>
<td>FYE indicator</td>
<td>Enrolled in first year experience course fall 2006: 1 = yes, 0 else</td>
<td>0.779</td>
<td>0.415</td>
</tr>
<tr>
<td>GPA one semester</td>
<td>Grade point average in residence after fall 2006: 4 point scale, cumulative</td>
<td>3.08</td>
<td>0.709</td>
</tr>
<tr>
<td>Retained one semester</td>
<td>Retained for spring 2007: 1 = yes, 0 else</td>
<td>0.938</td>
<td>0.241</td>
</tr>
<tr>
<td>GPA 1 year</td>
<td>Grade point average in residence after spring 2007: 4 point scale, cumulative</td>
<td>2.94</td>
<td>0.876</td>
</tr>
<tr>
<td>Retained 1 year</td>
<td>Retained for both spring 2007 and fall 2007: 1 = yes, 0 else</td>
<td>0.815</td>
<td>0.388</td>
</tr>
<tr>
<td>N</td>
<td># of observations</td>
<td>1997</td>
<td>–</td>
</tr>
</tbody>
</table>

Note: The sample size varies due to missing data and also as a result of retention. High school size = 1884, high school rank = 1884, act score = 1976, English placement = 1893, math placement = 1958. Remedial math included developmental math and basic algebra. For English placement, a test score of <375 resulted in remedial English placement, while a score of >565 tested out of Introduction to English Composition, the normal freshmen English class.
high school rank was in the 75th percentile. The average ACT composite score for incoming students was just over 24 and the average English placement test score was nearly 521. In addition, students were typically placed in average level math courses (measures for math and English placement are briefly described in Table 2).

Forty-two percent of new students matriculated with existing college credit, while one-quarter did not have a declared major. More than 92% of first year students lived on campus in the fall semester and 77.9% were enrolled in an FYE course. The university requires a summer orientation program for new students to visit the campus and register for fall classes. The majority of students attended orientation during the first 3 weeks of June (week 1: 35.5%, week 2: 34.1%, and week 3: 26.9%), while some delayed their visit until late August (3.5%). On average students enrolled in 15.1 credits and earned a GPA of 3.08 during their first semester of college. After 1 year, the average cumulative GPA of students had declined slightly to 2.94. The retention rate dropped from 93.8% after the fall semester to 81.6% at the end of the first year.

In comparison to the average 1 year retention rate of about 70% for similar 4-year public institutions (BA/BS/MA) in the U.S., this university’s retention rate of over 80% ranks high (ACT 2007). In addition, with 11 residence halls housing approximately 40% of all students, this university has a higher rate of on campus residence than the average rate of about 28% for other public institutions (U.S. Department of Education 2006). These facts are not surprising given the positive correlation between on campus residence and retention found in other research (Fidler and Moore 1996). Estimating models

The primary focus of this study was to determine the degree to which this FYE program positively impacted student retention and GPA after 1 year, while controlling for factors related to retention and academic performance. For retention, the dependent variable is an indicator equal to 1 if the student was retained for the fall 2007 semester after being enrolled for the entire 2006–2007 academic year and 0 otherwise. The maximum likelihood logit estimation is defined as:

$$Pr(R_i = 1) = \frac{\exp(Z_i)}{1 + \exp(Z_i)}$$ (1)

$$Z_i = \alpha + FYE_i \beta + ED_i \delta$$ (2)

$R = 1$ signals that student $i$ was retained, while FYE indicates participation in a FYE course in the fall 2006 semester and ED represents both educational and demographic variables as defined in Table 2. Similarly, the FYE impact on GPA was estimated using ordinary least squares regression where:

$$GPA_i = \alpha + FYE_i \beta + ED_i \delta$$ (3)

GPA represents the cumulative GPA in residence for student $i$ while all other variables are as defined in Eq. 2.

---

1 The timing of orientation is important because FYE course availability may be limited for students who attended later orientation sessions.
Goal compatible FYE

As discussed above, FYE instructors faced significant barriers in meeting the program goals and moreover, there are no specific rules or procedures to hold instructors accountable for doing so. Given this setup, participating faculty lacked the appropriate structure, support and incentive to create FYE courses that are compatible with the goals of the FYE program. Aside from the class size and peer mentor, it is possible that many FYE classes were little different than regular sections of the same course. To test this hypothesis, surveys were conducted among FYE instructors and FYE students following the 2006 fall semester under IRB approval. Survey responses were received from 49 out of 63 FYE instructors for a response rate of nearly 78%. In terms of students there were 559 responses out of 1,556 FYE students for a response rate of almost 36%.

Forty-nine percent of faculty respondents either agreed or strongly agreed that “it is difficult both to teach my course effectively and to have it meet all the goals of the FYE program.” Similarly 42% responded strongly disagree, disagree, or neutral when asked if they “took a significantly different approach to the teaching of the FYE course compared with the regular section of the same course.” Most striking of all was that only 55% said that they included the FYE goals in their course syllabus. Among students it was not uncommon to see comments such as “my mentor never attended class” and “I was jealous that my class never did any academic/social activities outside of class like my friend’s FYE class.” Other fairly common student responses were “my FYE class did not significantly help me ‘connect’ to the university” and “my mentor was not a valuable resource to me.” Taken together these results highlight the barriers and lack of incentive facing instructors in implementing strategies to meet the FYE goals.

The FYE instructor surveys were anonymous and therefore could not be used to identify quality FYE courses. Student surveys although confidential, were linked to specific FYE courses and therefore could be used to identify courses that were likely meeting the FYE program goals. The first criterion in this process was that at least 25% of enrolled students responded to the voluntary survey. Next, it was required that at least 25% of enrolled students either agreed or strongly agreed with the statement “My course helped me feel more connected to the university.” For the remaining classes, at least 25% of enrolled students had to either agree or strongly agree with two out of the three of the following statements: (1) “My course helped me succeed academically in my first semester.” (2) “My course helped me succeed socially in my first semester.” (3) My mentor served as a valuable resource in my course.” This process identified 26 FYE sections taught by 22 different instructors serving 480 students. These courses are listed in Table 3.

There are some limitations to using self-reported student responses to selected survey questions to identify successful FYE courses. It is possible that these responses are reflective of the individual successes of students rather than the result of a quality FYE course. Similarly, students in these selected FYE courses may just be the beneficiaries of great teaching in general as opposed to a special first year experience. There are two features of this FYE classification system that could mitigate these claims. The first selection requirement was first to have at least 25% of enrolled students respond to the voluntary survey. None of these courses had all of the students in the class respond to the survey and in most cases the response rate was between 30 and 50%. Additionally, most instructors teaching these selected FYE courses also taught non-FYE sections of the same course. As a result some first year students would have been taking the same courses from the same professors with some being FYE and some being non-FYE.
Despite the chance that student responses could have been signaling something other than the intended FYE experience, it is unlikely that all of the students in each of the classes selected through this process were in some way better than average or were simply the beneficiaries of better teaching. Although there is no guarantee that courses meeting the above selection criteria were in fact quality FYE courses, it is likely that this classification process has effectively isolated a group of courses in which the FYE goals were actively pursued. From this point forward these selected courses will be referred to as goal compatible FYE courses. The goal compatible FYE analysis will compare the 480 students in these selected classes to the 441 students with no FYE following the procedure outlined in Eqs. 1–3. Based on this analysis, any positive differences found between students in goal compatible FYE courses and students with no FYE could be interpreted as a program effect. However, given the limitations discussed above, it will be important to employ a more precise method of identifying quality FYE courses in future research.

Estimating issues

Multicollinearity could confound the estimations outlined above. Several of the variables that measure incoming student ability could be highly correlated. Table 4 shows a relatively high positive correlation between ACT score and both English placement exam score and math placement. In contrast, high school rank was not significantly correlated with any of the other three variables. Therefore, ACT score and high school rank were included as independent variables in the FYE decision model, which is consistent with the existing literature.

It will also be important to determine if there were any significant differences between FYE students and non-FYE students. If these students were systematically different in a way related to either retention or GPA, then it would be important to control for this. The student decision to enroll in an FYE course was modeled as a multiple regression. The dependent variable is an indicator equal to 1 if the student enrolled in an FYE course in the fall 2006 semester and 0 otherwise. The maximum likelihood logit estimation is defined as:

\[
\text{logit}(p) = \ln \left( \frac{p}{1-p} \right) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \cdots + \beta_k X_k
\]

where \( p \) is the probability of enrollment, \( X_1, X_2, \ldots, X_k \) are the independent variables, and \( \beta_0, \beta_1, \beta_2, \ldots, \beta_k \) are the coefficients to be estimated.
\[ PROB(FYE_i = 1) = \frac{\exp(Y_i)}{1 + \exp(Y_i)} \]  

(4)

\[ Y_i = \alpha + I_i \beta \]  

(5)

FYE = 1 signals that student \( i \) was enrolled in FYE as explained above, while \( I \) represents a vector of independent variables as defined in Table 2.

Table 5 shows that FYE students attended larger high schools than non-FYE students, but this influence was small and not statistically significant. Students who matriculated with existing college credits and those attending orientation later were less likely to enroll

---

Table 4 Independent variable correlations

<table>
<thead>
<tr>
<th>Variable</th>
<th>High school size</th>
<th>Act score</th>
<th>High school rank</th>
<th>English placement</th>
<th>Math placement</th>
<th>Low income</th>
<th>First generation</th>
<th>Orientation time</th>
</tr>
</thead>
<tbody>
<tr>
<td>High school size</td>
<td>1.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Act score</td>
<td>0.060</td>
<td>1.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High school rank</td>
<td>-0.094</td>
<td>0.227</td>
<td>1.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>English placement</td>
<td>-0.015</td>
<td>0.731</td>
<td>0.237</td>
<td>1.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Math placement</td>
<td>0.038</td>
<td>0.449</td>
<td>0.269</td>
<td>0.309</td>
<td>1.0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low income</td>
<td>-0.098</td>
<td>-0.075</td>
<td>0.016</td>
<td>-0.044</td>
<td>-0.075</td>
<td>1.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>First generation</td>
<td>-0.141</td>
<td>-0.189</td>
<td>-0.007</td>
<td>-0.159</td>
<td>-0.086</td>
<td>0.197</td>
<td>1.0</td>
<td></td>
</tr>
<tr>
<td>Orientation time</td>
<td>-0.062</td>
<td>-0.030</td>
<td>-0.072</td>
<td>-0.016</td>
<td>-0.064</td>
<td>0.051</td>
<td>0.007</td>
<td>1.0</td>
</tr>
</tbody>
</table>

Note: \( N = 1,764 \)

Table 5 Maximum likelihood logit estimation of decision to enroll in FYE

<table>
<thead>
<tr>
<th>Variable</th>
<th>Column 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male indicator</td>
<td>-0.100 (0.123)</td>
</tr>
<tr>
<td>White indicator</td>
<td>0.178 (0.222)</td>
</tr>
<tr>
<td>Age years</td>
<td>-0.090 (0.173)</td>
</tr>
<tr>
<td>Low income</td>
<td>-0.175 (0.155)</td>
</tr>
<tr>
<td>First generation</td>
<td>0.053 (0.121)</td>
</tr>
<tr>
<td>High school size</td>
<td>0.0006 (0.0003)</td>
</tr>
<tr>
<td>High school rank</td>
<td>-0.005 (0.005)</td>
</tr>
<tr>
<td>Act score</td>
<td>-0.026 (0.022)</td>
</tr>
<tr>
<td>Beginning credit</td>
<td>-0.272* (0.123)</td>
</tr>
<tr>
<td>Orientation time</td>
<td>-0.401** (0.066)</td>
</tr>
<tr>
<td>Undeclared</td>
<td>-0.202 (0.130)</td>
</tr>
<tr>
<td>On campus</td>
<td>0.079 (0.212)</td>
</tr>
<tr>
<td>Fall credits</td>
<td>0.033 (0.047)</td>
</tr>
<tr>
<td>Constant</td>
<td>4.08 (3.39)</td>
</tr>
<tr>
<td>LR chi-square</td>
<td>58.60</td>
</tr>
<tr>
<td>McFadden’s pseudo ( R^2 )</td>
<td>0.0299</td>
</tr>
<tr>
<td>Log-likelihood</td>
<td>-952</td>
</tr>
<tr>
<td>Observations</td>
<td>1869</td>
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</tbody>
</table>

Note: The dependent variable is one if the student was enrolled in an FYE course during the fall 2006 semester. Coefficient estimates are presented and standard errors are in parentheses.  

* Denotes statistical significance of 5% (\( p \leq 0.05 \))  

** Denotes statistical significance of 1% (\( p \leq 0.01 \))
in an FYE course. Because having existing college credits could be related to student performance and college persistence, estimations of the FYE impact on retention and GPA should control for this. Students who attended orientation late were significantly less likely to enroll in a FYE course. According to student survey data, FYE course availability was substantially reduced for these late registrants. However, Table 4 shows that late orientation attendance is not strongly correlated with student ability variables at entry such as ACT score, high school rank, English placement exam score, or math placement. Therefore, it is not likely that particularly good or bad students were systematically attending the late orientation session giving them less access to FYE courses. All other variables are estimated to have an insignificant effect on the FYE enrollment decision. Based on this analysis, FYE selection bias should not be a major concern.

Results

FYE retention

Table 6 presents estimates from the logistic regression of the FYE impact on student retention after 1 year. Column 1 has no controls while Column 2 controls for factors that may be related to academic persistence. Neither of these estimations found a statistically...
significant positive effect from being enrolled in a FYE course. Column 2 shows that having a higher high school rank, entering college with existing credits, living on campus and being male all increased the probability of retention. In contrast, having an undeclared major, being a first generation college student and being an older student were all associated with a lower likelihood of returning after the first year. Each of the findings above is in line with a priori expectations except for possibly the male versus female result. All else equal it might have been expected that males would have a lower retention rate. However, among the FYE research cited in this paper the results regarding gender and retention are mixed and in many cases the issue of gender is not explicitly addressed.

The above estimates are not directly interpretable as marginal effects due to the nature of logistic regression analysis. Although some factors were found to influence retention, there was no statistically significant relationship between taking an FYE course and student retention. Because the focus of this paper is to quantify the FYE program effect on student outcomes, analysis and discussion of the marginal effects are postponed until below.

Goal compatible FYE retention

This initial estimation may have failed to identify a positive FYE effect because many FYE courses were in practice little different than regular courses. Recall that some FYE courses were identified as being compatible with the FYE goals based on student survey responses as outlined above. Column 3 of Table 6 shows that taking a goal compatible FYE course had a statistically significant positive impact on student retention. Column 4 shows this result to be robust to the inclusion of control variables. The estimated impacts of the remaining variables were generally consistent to those from the full sample (see Column 2). High school rank, beginning credits and living on-campus were all positively correlated with the probability of retention, while older students were again less likely to return. There were some minor differences in the covariate estimates from the earlier model. The finding that male students were more likely to be retained was no longer statistically significant. In addition, the estimated negative impacts of having an undeclared major and being a first generation college student were also no longer statistically significant.

It is now possible to examine the marginal FYE program effects using these estimates. The predicted probabilities of retention for this model are listed in Table 7. The estimated retention rate for a student with average characteristics was 84.9%. This is higher than the actual observed retention rate of 81.6%, but still within a reasonable bound. The next 2 rows show that the average student enrolled in a goal compatible FYE course was 6.4 percentage points more likely to return after 1 year than if they did not have an FYE course (0.878 – 0.814). It is useful to compare this to the retention impact from living on campus. The next row shows that an average student without an FYE course and living off campus was only 70.3% likely to return. If this student had lived on campus the likelihood of retention would have increased by 11.8 percentage points (0.821 – 0.703). If this student had also taken a goal compatible FYE course, the likelihood of retention would have increased by an additional 6.0 percentage points (0.881 – 0.821). This suggests that if all incoming freshmen lived on campus and enrolled in an FYE course that met the program goals, the university could expect an approximate 88.1% retention rate after 1 year.
Below/above average students

It is important to examine if the FYE program had a different impact on a below average student. A student was defined as below average if they matriculated with no existing college credits and an ACT score and high school rank 1 standard deviation below the mean. In addition, she/he was a first generation college student with no declared major and lived off campus, but was average in all other respects. The predicted retention rate for a below average male student with no FYE was 69.4%. If he had lived on campus the likelihood of retention would have increased by 12.2 percentage points (0.816 – 0.694). If he had also taken a goal compatible FYE course the likelihood of retention would have increased by an additional 6.1 percentage points (0.877 – 0.816). Similarly, the predicted retention rate for a below average female student with no FYE was 61.8%. If she had lived on campus the likelihood of retention would have increased by 14.1 percentage points (0.759 – 0.618). If she had also taken a goal compatible FYE course the likelihood of retention would have increased by an additional 7.7 percentage points (0.836 – 0.759).

A student was defined as above average if she/he matriculated with existing college credits and an ACT score and high school rank 1 standard deviation above the mean. In addition, she/he was a first generation college student with no declared major and lived on campus, but was average in all other respects. The predicted retention rate for an above average student with no FYE is 88.9% which was significantly higher than for below average students. If this student had also taken a goal compatible FYE course it would have increased the likelihood of retention by 3.9 percentage points (0.928 – 0.889).
In summary, once the analysis was restricted to comparing selected FYE courses in which the program goals were likely pursued to no FYE course, a positive retention effect was found. The estimated positive FYE impact was larger for below average female students and smaller for above average students. Overall, the goal compatible FYE effect was reasonably large in magnitude. It is worth noting that the retention effect from living on campus was consistently estimated to be approximately twice that of taking a goal compatible FYE course. There are certain limitations to the claim that taking an FYE course significantly improved the probability of student retention. However, these results suggest that taking a goal compatible FYE course at this university adds value to the student experience in addition to the strong positive retention effects of living on campus.

FYE grade point average

Table 8 presents estimates from the ordinary least squares regression of the FYE impact on student GPA after 1 year using the full sample. Column 1 has no controls while Column 2 controls for factors that may be related to academic performance. Unlike logistic regression, these estimates are directly interpretable as marginal effects. With no controls the impact of being enrolled in an FYE course was estimated to raise a student’s GPA by 0.101 points and this effect is statistically significant at the 5% level. Adding controls increased this impact to 0.122 points and raised the statistical significant to the 1% level. ACT score

<table>
<thead>
<tr>
<th>Variable</th>
<th>All FYE No Controls</th>
<th>Controls</th>
<th>Goal compatible FYE No controls</th>
<th>Controls</th>
</tr>
</thead>
<tbody>
<tr>
<td>FYE indicator</td>
<td>0.101* (0.047)</td>
<td>0.122** (0.045)</td>
<td>0.160** (0.054)</td>
<td></td>
</tr>
<tr>
<td>Goal compatible FYE indicator</td>
<td>0.163** (0.058)</td>
<td>0.207** (0.060)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Act score</td>
<td>0.018** (0.007)</td>
<td>0.031** (0.010)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High school rank</td>
<td>0.022** (0.001)</td>
<td>0.021** (0.002)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Beginning credit</td>
<td>0.151** (0.040)</td>
<td>0.241* (0.106)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Undeclared</td>
<td>−0.051 (0.043)</td>
<td>0.070 (0.064)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>On campus</td>
<td>0.243** (0.071)</td>
<td>0.241* (0.106)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low income</td>
<td>−0.080 (0.052)</td>
<td>−0.027 (0.0675)</td>
<td></td>
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</tr>
<tr>
<td>First generation</td>
<td>−0.170** (0.039)</td>
<td>−0.119* (0.057)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age years</td>
<td>−0.025 (0.056)</td>
<td>−0.088 (0.082)</td>
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<tr>
<td>Male indicator</td>
<td>−0.075* (0.040)</td>
<td>−0.068 (0.058)</td>
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<tr>
<td>White indicator</td>
<td>−0.022 (0.074)</td>
<td>−0.057 (0.105)</td>
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<td></td>
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<tr>
<td>Constant</td>
<td>2.86** (0.042)</td>
<td>1.06* (1.06)</td>
<td>2.86** (0.042)</td>
<td>1.93 (1.54)</td>
</tr>
<tr>
<td>$F$-Stat</td>
<td>4.06</td>
<td>40.48</td>
<td>7.95</td>
<td>20.99</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.0023</td>
<td>0.1934</td>
<td>0.0086</td>
<td>0.2140</td>
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<tr>
<td>Adjusted $R^2$</td>
<td>0.0018</td>
<td>0.1886</td>
<td>0.0075</td>
<td>0.2038</td>
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<tr>
<td>Observations</td>
<td>1997</td>
<td>1869</td>
<td>921</td>
<td>860</td>
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Note: The dependent variable is cumulative grade point average in residence after the 2006–2007 academic year (4 point scale). Coefficient estimates are presented and standard errors are in parentheses.

* Denotes statistical significance of 5% ($p < 0.05$)

** Denotes statistical significance of 1% ($p < 0.01$)
and high school rank were both estimated to have a statistically significant positive impact on student GPA. The ACT impact was particularly small with a 1 point increase in composite score predicted to raise GPA by just 0.018, while a 10 percentage point increase in high school rank added an estimated 0.22 points to GPA. Matriculating with existing college credits and living on campus were also positively correlated with a higher GPA. In contrast, first generation college students and males were predicted to have lower GPAs. Entering with exam or transfer credit added 0.151 points to GPA compared to no credit, while living on-campus added 0.243 points to GPA all else equal. On the other hand, a first generation student was expected to have a lower GPA by 0.17 points, while males were predicted to have a lower GPA by 0.075 points.

Goal compatible FYE grade point average

Columns 3 and 4 of Table 8 report results for the estimated effect of a goal compatible FYE course on GPA. In the model with full controls the estimated impact on GPA of 0.160 points was larger than for all FYE courses. All remaining estimates were nearly identical in statistical significance and somewhat similar in magnitude compared to Column 2. The impact of ACT score nearly doubled and existing college credits also had a larger estimated impact. The effect of being a first generation student was reduced and the prediction of a lower GPA for males was no longer statistically significant.

These results are generally consistent with the existing literature and are similar to the retention analysis. The FYE program had a positive influence on student academic performance after 1 year as measured by cumulative GPA in residence. This impact was larger when the analysis is limited to only goal compatible FYE courses. The estimated boost to GPA attributable to participating in the FYE program was much smaller than the positive effect of living on campus. However, as was the case with retention, it appears that taking a goal compatible FYE course at this university improves academic performance in addition to the positive influence of living on campus.

Discussion

In an effort to improve student outcomes, many institutions have begun to allocate significant resources to improving the first year experience. In 1997 one particular medium-size Midwestern public university in the U.S. initiated a FYE program. The program was designed to add both curricular and extracurricular components to existing core courses in an effort to integrate students into the university community. Enrollment was capped at 20 students and each course was assigned a student peer mentor. This design presented a challenge to instructors because of the significant work needed to infuse the suggested additional activities into their existing courses. Moreover, despite the defined program goals, there are no specific rules or procedures to hold instructors accountable for meeting these goals.

In summary, once the analysis was restricted to comparing selected FYE courses in which the program goals were likely pursued to no FYE course, a positive retention effect was found.

Using a combination of student and faculty survey data and university administrative data this study measured the impact of this FYE program on GPA and retention after 1 year for the cohort of entering students in the fall 2006 semester. The results suggest that there was no positive effect on retention, but the GPAs for FYE students were higher than
non-FYE students. Reducing the sample to include only selected FYE courses in which the program goals were likely pursued yielded a positive effect on retention and also accentuated the GPA differential. The estimated positive impact on retention was larger for below average students (especially females) and smaller for above average students. In terms of completely understanding the retention of first year students it is important to note that all estimates of the positive FYE impact were much smaller than the positive influence from living on campus.

This FYE program could be improved by instituting a procedure to ensure that the program goals are being met in all FYE courses and that instructors are held accountable for doing so. This would require a formal application and screening process for selecting FYE instructors. In addition, department and university personnel committees need to recognize the value of quality teaching in the FYE program and reward instructors for performing at a high level. The administration would also need to allocate sufficient resources to training and curriculum workshops to encourage faculty to develop quality FYE courses. These workshops should also include training for the student peer mentors and methods for faculty to integrate these students into the course.

Another consideration is that the current FYE model does not provide instructors with sufficient classroom time necessary to achieve the FYE goals. It is hard to imagine that an existing core college course would come to the FYE program partly empty, containing too little content to fill up three credits. Perhaps this program asks too much of a three-credit disciplinary course by taking a perfectly rich, busy, challenging course and adding a significant amount of new material to its schedule. Therefore, it could prove useful to add 1–2 credits to each FYE course to facilitate this process.

Given the strong positive influence of living on campus, this university should also consider investing in activities that link the FYE course experience to on campus residence hall life to explore if such activities further improve student outcomes. Similarly, there may be significant gains from efforts to more effectively integrate the less than 10% of incoming freshmen that do not live on campus into the university community. These recommendations are supported by other research showing that the best retention outcomes resulted from combining living on campus with participation in a first year seminar (Fidler and Moore 1996).

If these recommendations are followed, the number of FYE courses that meet the criteria of goal compatible defined earlier would likely increase. As a result, the positive impacts of the FYE program on both student retention and GPA should also increase. However, there are many competing opportunities to use resources to enhance the college experience and improve student outcomes. Therefore, a careful analysis of all of the possibilities is needed in order to optimally utilize resources as the university develops a strategic plan for the future.

This research provides an initial measure of the FYE impact on this cohort of incoming students. It is the first step in developing an on-going assessment of this university’s efforts to foster student success through a FYE intervention. Despite some limitations, the results suggest that a quality program focused on enhancing the first year student experience can have a meaningful positive effect on both GPA and retention. One key result is that living on campus had a strong positive influence on both academic performance and persistence among first year students at this university. However, the overall results suggest there is additional educational value added to the student experience from taking a FYE course as long as the course was dedicated to meeting the program goals. There are many issues that are beyond the scope of this paper and so additional research is necessary to guide sound decision making by the university administration. This paper also provides valuable
information to other institutions seeking to begin or improve an existing first year experience program both in the U.S. and internationally. It is important to note that the results found here are specific to this university and this program and therefore may not generalize to other schools.

Future analyses should include a complete examination of the survey results from both faculty and students to better understand this FYE program from the diverse perspectives of these important stakeholders. Future research should also provide a detailed comparison of the measured benefits of this FYE program to the total opportunity cost of this use of resources. In the long run it will be important to follow the 2006–2007 cohort of students in a longitudinal analysis of the FYE impact on GPA, retention and eventually graduation. Data on subsequent cohorts of entering freshmen should also be examined as this FYE program evolves in the coming years. The results of all future research on the FYE program at this university should be compared to other institutions contributing to a national dialogue on FYE best practices.

Appendix A

<table>
<thead>
<tr>
<th>Table A.1 Retention trends 1983–2007: Freshman to Sophomore year</th>
</tr>
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<table>
<thead>
<tr>
<th></th>
<th>Highest (%)</th>
<th>Lowest (%)</th>
<th>Current (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Two-year public</td>
<td>53.1 ('83)</td>
<td>51.3 ('04)</td>
<td>51.4</td>
</tr>
<tr>
<td>BA/BS public</td>
<td>70.0 ('04)</td>
<td>66.4 ('96, '05)</td>
<td>67.6</td>
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<tr>
<td>MA public</td>
<td>71.6 ('06)</td>
<td>68.1 ('89)</td>
<td>70.5</td>
</tr>
<tr>
<td>PhD public</td>
<td>78.1 ('04)</td>
<td>73.3 ('86)</td>
<td>78.0</td>
</tr>
<tr>
<td>Two-year private</td>
<td>72.6 ('92)</td>
<td>57.4 ('07)</td>
<td>57.4</td>
</tr>
<tr>
<td>BA/BS private</td>
<td>74.0 ('89)</td>
<td>70.1 ('97)</td>
<td>70.2</td>
</tr>
<tr>
<td>MA private</td>
<td>78.0 ('85)</td>
<td>73.2 ('07)</td>
<td>73.2</td>
</tr>
<tr>
<td>PhD private</td>
<td>85.0 ('85)</td>
<td>81.1 ('07)</td>
<td>81.8</td>
</tr>
<tr>
<td>National</td>
<td>68.7 ('07)</td>
<td>66.6 ('96)</td>
<td>68.7</td>
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</table>

References


