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An Implementation and Early Impacts Study of Eight Texas Developmental Summer Bridge Programs

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THE DEVELOPMENTAL SUMMER BRIDGE PROJECT

National Center for Postsecondary Research
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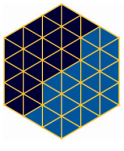

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Overview

In 2007, the Texas Higher Education Coordinating Board (THECB) funded 22 colleges to establish developmental summer bridge programs. Aimed at providing an alternative to traditional developmental education, these programs involve intensive remedial instruction in math, reading, and/or writing and college preparation content for students entering college with low basic skills. In 2009, the National Center for Postsecondary Research (NCPR) launched an evaluation of eight developmental summer bridge programs in Texas (seven at community colleges and one at an open-admissions four-year university), the early findings of which are described in this report.

Students who participated in the study were randomly assigned to the program group or the control group. Program group students participated in the developmental summer bridge programs, while control group students received colleges' regular services. All developmental summer bridge programs had four common features: accelerated instruction in math, reading, and/or writing; academic support; a "college knowledge" component; and the opportunity for participants to receive a $400 stipend.

The main findings of this preliminary report are:

- All eight programs in the study were implemented with reasonable fidelity to the model framed by the THECB, but they varied on some key dimensions.
- Program costs averaged about $1,300 per student but varied widely.
- Program group students did not enroll in either the fall or spring semester at significantly different rates than control group students; enrollment rates were high for both groups.
- There is evidence that the program students were more likely to pass college-level courses in math and writing in the fall semester following the summer programs. The findings also suggest that program students were more likely to attempt higher level reading, writing, and math courses compared with control group students.

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Preface

Each year, colleges across the nation, and open-access community colleges in particular, face a difficult challenge — how to improve the skills of incoming students who arrive underprepared for college-level coursework. Typically, colleges recommend that underprepared students enroll in developmental education courses; nationally, almost 60 percent of community college students take at least one developmental education course. However, taking developmental courses delays the accumulation of college credits, and evidence suggests that the more developmental courses students must take, the less likely they are to ultimately earn a degree or credential.

Developmental summer bridge programs may offer a partial solution to this problem. Designed to reduce the need for developmental education in college, summer bridge programs provide recent high school graduates with remedial instruction in reading, writing, or math, or some combination of these, along with an introduction to college. These programs, which typically run for four to six weeks during the summer, may allow students to advance through the developmental curriculum in a compressed time frame and ideally enroll in college-level courses in the fall semester.

In addition to supporting students' academic progress, summer bridge programs may also help students make the psychological and emotional adjustments involved in the transition from high school to college. The relationships that students develop with their peers and program faculty during the intensive program may strengthen their ties to college. Summer bridge programs may also help students become familiar with the support services that colleges offer and how to access them.

Recognizing the need to increase participation and success in higher education, in 2007 the Texas Higher Education Coordinating Board (THECB) began to encourage the creation of developmental summer bridge programs and other similar initiatives around the state. In 2009, the National Center for Postsecondary Research (NCPR) began a collaboration with eight Texas colleges and the THECB to study the effectiveness of the developmental summer bridge program model. This report describes their implementation and reports early findings on their impact on student outcomes. A final report, to be released next year, will describe students' progression through developmental education, their success in college-level courses, and their persistence into and through the second year of college. Despite the popularity of summer bridge programs, little empirical research on their implementation or outcomes has previously been conducted. The research in this report represents an important step toward developing an understanding of how these programs work and what benefits they may provide for students.

The early results described here are modest but encouraging. While the eight developmental summer bridge programs examined had no effect on college enrollment rates, they appear to have improved student success rates in entry-level college courses in math and writing. Reducing the barriers to college-level coursework for underprepared students may increase the likelihood that these students will persist and earn a college credential. Developmental summer bridge programs, then, may form an important part of a strategy to improve completion rates at colleges in Texas and elsewhere.

Thomas Bailey
Director, NCPR

Acknowledgments

We would like to first express our deep gratitude to the administrators and faculty at each of the eight colleges that participated in this study: El Paso Community College, Lone Star College–CyFair, Lone Star College–Kingwood, South Texas College, Texas A&M International University, Palo Alto College, San Antonio College, and St. Philip's College. Each of these institutions welcomed our collaboration and courageously subjected their innovative programs to rigorous evaluation. We would like to express special thanks to each of the site liaisons — Irma Camacho, Christine Timmerman, Ruben Flores, Michael Chavez, Ruben Izaguirre, Luzelma Canales, Conchita Hickey, Michael Flores, and Abel Gonzales — who devoted countless hours to the students, the bridge programs, and the research study. We also appreciate the assistance of our data liaisons at each of the colleges, who aided our data collection efforts by sending us student data files — Art Gonzalez, Carol Kay, Doug Schirmer, Troy Touchette, Kristina Lopez, Rhonda Johnson, Mecca Salahuddin, Brenda Cole, Jinhao Wang, Wesley Jennings, Siobhan Fleming, Daniel Dean, Frank Segovia, Robert Aguinaga, and Catherine Chapa. We thank the Texas Higher Education Coordinating Board for their partnership and support. In particular, we want to thank David Gardner, Lynette Heckman, Robin Zuniga, Belinda Hernandez, and Judith Loredo for sharing information with us, providing us with student data, and helping us to coordinate meetings with the colleges.

The Texas Developmental Summer Bridge Programs Study is part of the National Center for Postsecondary Research (NCPR), which is generously supported by a grant (R305A060010) from the Institute of Education Sciences, U.S. Department of Education. Katina Stapleton, our program officer, has been a stalwart supporter of this project since its inception. We also received considerable financial support from Houston Endowment that enabled the summer bridge programs to recruit many more students than ever before. We thank George Grainger at Houston Endowment for his endorsement and support of this project.

Additionally, we want to acknowledge the varied and important contributions of members of NCPR who made this report possible. NCPR was designed to be a collaborative research center, and this research project has truly been a team effort. Thomas Bailey, director of NCPR, was instrumental in recruiting institutions, designing the study, and weighing in with useful comments at every critical juncture. Thomas Brock and Robert Ivry helped guide the early design of the Texas Summer Bridge project and provided detailed suggestions on drafts of this report. Marie-Andrée Somers provided invaluable technical advice on the statistical analyses. Clive Belfield devised and conducted the cost study. Kendris Brumfield worked tirelessly with the colleges to support recruitment efforts

and random assignment procedures. Elliot Peterson and Vanessa Martin provided critical support in developing, implementing, and monitoring random assignment procedures. Scott Lloyd, Katherine Hughes, and Michelle Hodara conducted field research at the various college sites. Rachel Hare Bork drafted the executive summary and helped with countless meeting logistics. We are grateful to Katherine Hughes, David Breneman, and Mary Visher for their candid and insightful comments on earlier drafts. M. Joel Voss and Jacob Rooksby helped us to organize chapters, edited text, and created tables for the report. Amy Mazzariello and Doug Slater skillfully edited the report and prepared it for publication.

Finally, we thank the hundreds of students who participated in this study. We hope the findings from this study will be used to improve the programs and institutions that serve them.

The Authors

Executive Summary

Displayed on billboards and license plates alike, "College for All Texans" is the unofficial motto that is promoted statewide to encourage college readiness, participation, and success in Texas. Policymakers, educators, and business leaders agree that Texas must increase rates of college participation and success to preserve the economic vitality of the state and to secure the future well-being of Texas residents. To address the dynamic needs of the growing state population, Texas launched in 2000 an ambitious statewide strategic plan called *Closing the Gaps by 2015*. One of the primary objectives of this plan is to increase enrollment and academic success in Texas colleges and universities.

One component of the Closing the Gaps by 2015 initiative was the creation of developmental summer bridge programs — intensive summer experiences that offer eligible students remedial instruction in math, reading, and/or writing along with an introduction to college. Developmental summer bridge programs aim to reduce or eliminate the need for developmental courses so that more students are prepared for college-level courses in their first semester of college. Programs typically offer intensive, targeted coursework for four to five weeks over the summer, accompanied by tutoring, additional labs, and student support services. The integrated approach used in developmental summer bridge programs is thought to help ease students' transition into college. But despite the increasing popularity of summer bridge programs across the country, little empirical research on their outcomes or impacts has been conducted.

In 2009, the National Center for Postsecondary Research (NCPR)[1] launched an evaluation of eight developmental summer bridge programs in Texas to assess whether these programs reduce the need for developmental coursework and improve student outcomes in college. The evaluation uses an experimental design to measure the effects of these programs on college enrollment and success. At each college, students who consented to participate in the study were randomly assigned to one of two groups: a program group that was eligible to participate in a developmental summer bridge program and a control group that was eligible to receive their college's regular services. (Random assignment creates two groups that are similar in both characteristics that can be measured, such as age or academic attainment, and those that cannot be reliably measured, such as motivation. This ensures that any differences in observed outcomes — called *impacts* — between the

[1]NCPR is funded by a grant (R305A060010) from the Institute of Education Sciences, U.S. Department of Education. NCPR is a partnership of the Community College Research Center, Teachers College, Columbia University; MDRC; the Curry School of Education at the University of Virginia; and faculty at Harvard University. NCPR conducts studies that measure the effectiveness of programs designed to help students make the transition to college and master the basic skills needed to advance to a degree.

two groups can be attributed with confidence to participation in the developmental summer bridge programs.) Students participated in the developmental summer bridge programs in summer 2009, and their academic progress is being followed through the 2010–2011 academic year. All developmental summer bridge programs had four common features: an accelerated format, academic support, a "college knowledge" component, and the opportunity for participants to receive a $400 stipend. Eight institutions were selected for inclusion in this study:

- El Paso Community College (El Paso, TX)
- Lone Star College–CyFair (Houston, TX)
- Lone Star College–Kingwood (Houston, TX)
- South Texas College (McAllen, TX)
- Texas A&M International University (Laredo, TX)
- Palo Alto College (San Antonio, TX)
- San Antonio College (San Antonio, TX)
- St. Philip's College (San Antonio, TX)

Table ES.1 shows the number of students enrolled in the study at each participating college.

Texas Developmental Summer Bridge Programs

Table ES.1

Study Enrollment

Institution	Students in Full Sample
El Paso Community College	273
Lone Star College–CyFair	125
Lone Star College–Kingwood	87
South Texas College	138
Texas A&M International University	211
Palo Alto College	88
San Antonio College	152
St. Philip's College	258
Total	**1,318**

This report is the first of two that will be published related to this research. This report presents early impact results from the evaluation and information on how the developmental summer bridge programs were implemented. It focuses on the models used, the range of design features incorporated, how the programs were administered, and how they were perceived by those involved, including college and program leaders, faculty, advisors, and students. A cost study of developmental summer bridge programs is also included. The following are the main findings of this preliminary report:

- All eight programs in the study were implemented with reasonable fidelity to the model framed by the Texas Higher Education Coordinating Board (THECB), but they varied on some key dimensions.
- Program costs averaged about $1,300 per student but varied widely.
- Program group students did not enroll in either the fall or spring semester at significantly different rates than control group students; enrollment rates were high for both groups.
- There is evidence that the program students were more likely to pass college-level courses in math and writing in the fall semester following the summer programs. The findings also suggest that program students were more likely to attempt higher level reading, writing, and math courses compared with control group students.

Implementation of the Developmental Summer Bridge Program

Of the eight developmental summer bridge programs included in the study, four were course-based, while the other four were freestanding. Course-based programs were essentially standard developmental courses, modified or condensed to create a shorter, more intensive experience. Freestanding programs were designed to provide students the opportunity to advance multiple skill levels by offering basic skills instruction and were not based on a specific course. These programs did not require students to enroll in a summer course and did not award any form of credit. In both course-based and freestanding programs, students received additional academic support, instruction in college knowledge, and a stipend upon successful completion.

- **All eight programs in the study were implemented with reasonable fidelity to the model framed by the THECB, but they varied on some key dimensions.**

The goals of the summer bridge programs were primarily achieved through the teaching and learning that occurred in the classroom and via the various support structures. In most cases, faculty, tutors, and mentors worked together with the goal of facilitating student learning. Bundling an array of services into the programs and actively bringing those services to the students also featured prominently in an underlying theory of change for the summer bridge program model. Each of the core features — accelerated instruction in math, reading, and/or writing; college knowledge; academic support; and the student stipend — functioned together to deliver a coherent learning experience. Though there were many common elements across the eight programs, there were also unique features in each, based on the institutional contexts.

- **Program costs averaged about $1,300 per student but varied widely.**

Across the eight sites, approximately one third of costs were for staffing and just over one quarter for student resources. Total costs ranged from $62,633 to $296,033, which reflects the significant variance across sites in program enrollment, duration, and intensity. Across the eight sites, the average per-student cost ranged from $840 to $2,349. The average across all eight sites was $1,319 — an estimate of the resources needed per student to offer a developmental summer bridge program.[2] Unsurprisingly, there is no strong evidence of economies of scale in terms of numbers of students enrolled; the high-value stipend is a constant for each student.

Key Impact Findings

Using data obtained from the Texas Higher Education Coordination Board and from the colleges that ran the summer bridge programs, we conducted several analyses of the overall effectiveness of the developmental summer bridge program model, comparing outcomes for program and control group students. Primary indicators of students' academic progress included enrollment in college in the fall of 2009 and progression in developmental and college-level courses in math, reading, and writing.

- **Program group students did not enroll in either the fall or spring semester at significantly different rates than control group students; enrollment rates were high for both groups.**

We found that the programs did not have any impact on fall 2009 registration rates; that is, students in the program group registered for courses in the fall 2009 semester at a

[2]Some costs may be interpreted as start-up costs and so are unlikely to be needed if the programs are run in subsequent years. If these costs are amortized over three years, then the average cost of the programs is reduced.

rate that is statistically indistinguishable from the registration rate of the control group. This finding contradicts the hypothesis that the summer bridge programs would boost enrollment rates among the program group students.

- **There is evidence that the program students were more likely to pass college-level courses in math and writing in the fall semester following the summer programs. The findings also suggest that program students were more likely to attempt higher level reading, writing, and math courses compared with control group students.**

While students in the program and control groups attempted at least one math course at similar rates, students who participated in a developmental summer bridge program went on to attempt the first college-level math course at a significantly higher rate than students in the control group. A significantly higher percentage of program group students passed this first college-level math course. Program group students were also significantly more likely to attempt a college-level reading course and significantly less likely to attempt the lowest level of developmental reading. Significantly more program group students than control group students attempted at least one writing course and passed their first college-level writing course. In addition, during the 2009–2010 academic year, students in the program group attempted one more college-level credit than students in the control group.

Looking Ahead to the Impact Findings

Overall, the evidence catalogued in this early look at the impact of the developmental summer bridge programs suggests that students' course-taking patterns are trending in the desired direction. In addition, these early results suggest that developmental summer bridge programs might help prepare students to pass introductory college-level math and writing courses. It is important to note that these early findings reflect student academic progress for only one year, and longer follow-up will provide additional evidence. A final report with two years of longitudinal follow-up will be released within the next year. We expect to learn more about students' progression through developmental education, their success in college-level courses, and their persistence into and through the second year of college.

Chapter 1

Introduction to the Texas Developmental Summer Bridge Program

Displayed on billboards and license plates alike, "College for All Texans" is the unofficial motto that is promoted statewide to encourage college readiness, participation, and success in Texas. Policymakers, educators, and business leaders agree that Texas must increase rates of college participation and success to preserve the economic vitality of the state and to secure the future well-being of Texas residents. To address the dynamic needs of the growing state population, Texas launched in 2000 an ambitious statewide strategic plan called *Closing the Gaps by 2015*. One of the primary objectives of this plan is to increase enrollment and academic success in Texas colleges and universities.

To this end, the Texas Higher Education Coordinating Board (THECB) in 2007 funded 22 colleges to establish developmental summer bridge programs — intensive summer experiences that offer eligible students remedial instruction in math, reading, and/or writing along with an introduction to college. These programs were designed to provide an alternative to traditional developmental education course sequences, which may span several semesters, by helping students with low basic skills to build competencies before entering college. Summer bridge programs have become a popular strategy in Texas for increasing college readiness among recent high school graduates, and other two- and four-year colleges in the state have developed summer bridge programs independent of the THECB.

Nationally, summer bridge programs have emerged as a potentially promising strategy for improving postsecondary success. These programs — typically held in the summer between high school graduation and fall matriculation in college — offer students accelerated, focused learning opportunities that can help them acquire the knowledge and skills needed for college success. But despite the increasing popularity of summer bridge programs across the country, little empirical research on their outcomes or impacts has been conducted.

In 2009, the National Center for Postsecondary Research (NCPR) launched an evaluation of eight developmental summer bridge programs in Texas to assess whether these programs reduce the need for developmental coursework and improve student outcomes in college. The evaluation uses an experimental design to measure the effects of the programs on college enrollment and success. At each college, students who consented to participate in the study were randomly assigned to one of two groups: a program group that

was eligible to participate in a developmental summer bridge program and a control group that was eligible to receive their college's regular services.

The Developmental Summer Bridge Program Model

The developmental summer bridge programs in this study were offered primarily to recent high school graduates at eight institutions of higher education — one open-admissions four-year university and seven community colleges — throughout the state of Texas in the summer of 2009.[1] Students attended the developmental summer bridge programs three to six hours daily for four to five weeks and received instruction in at least one area of academic need — math, reading, or writing — as well as guidance in the "college knowledge" needed to navigate new academic terrain. The programs were free of charge to the students at most sites. The developmental summer bridge programs at each institution in this study had four common features: accelerated instruction in math, reading, and/or writing; academic support; a college knowledge component; and the opportunity to earn a $400 stipend. All of these features except the stipend were a part of the summer intensive experience model framed by the THECB. The addition of the opportunity to earn a $400 stipend was initiated by NCPR.

Research suggests that underprepared students who participate in summer bridge programs show improvement in their academic performance (Bengis, 1991). Proponents of summer bridge programs suggest there are several ways in which these programs may be more effective than traditional models of developmental education in helping students with below-average skill sets to build competencies and succeed in college. First, the accelerated instruction they provide may allow at-risk students to advance through developmental course sequences in a compressed time frame, ideally enabling recent high school graduates to enroll in college-level courses in the fall of their first year of college. Immediacy is important: at least one study posits that the length of time students spend in developmental education courses is negatively related to degree completion (Adelman, 1998). This could be because students in developmental education arrive at college without being adequately prepared for the work they will have to do there. An alternate hypothesis is that developmental courses themselves tend to discourage students and lead them to drop out. If this hypothesis is true, enrolling students in college-level courses as soon as possible after high school may improve students' probability of degree attainment.

Another reason that developmental summer bridge programs may be more effective than traditional developmental education sequences is that the former offer an array of support services to ease the transition, both academically and socially, from high school to

[1]Chapter 3 contains a detailed discussion of participating institutions and programmatic components.

college. Program students are required to attend tutorials and other specialized academic support services (e.g., writing or math labs and advising sessions). Services such as these might aid students in their transition to college and encourage their success in the college environment (Santa Rita & Bacote, 1997). Programs link students with a mentor or advisor, and the intensive time frame of summer bridge programs may help students form close relationships with their peers and faculty. Research literature on learning communities and career academies suggests that cohort membership is positively related to relationship building (Maher, 2005; Tinto, 1997). Relationships with mentors, peers, and faculty may strengthen students' academic and social support networks as well as their ties to the institution, which may in turn promote student persistence.

In addition, developmental summer bridge programs help participants become accustomed to their new environment. Students attending open-access institutions require social know-how to be successful in selecting courses, obtaining help, and navigating bureaucracies. This knowledge is often less accessible to traditionally underserved students. Introducing at-risk students to the college environment and actively teaching them how to navigate and take advantage of services may make these students more likely to persist (Deil-Amen & Rosenbaum, 2003; Rosenbaum, Deil-Amen, & Person, 2006).

Finally, students in the current study who successfully completed the program were provided a $400 stipend. In making the stipend part of the program model, NCPR aimed to enable students to devote more time to their studies by reducing their need to work — providing another mechanism by which summer bridge programs could potentially improve students' academic performance.

All four components of the developmental summer bridge programs were designed to facilitate students' success in both the program and their future courses. While all programs contained the features described above, each institution tailored the developmental summer bridge program model to meet the needs of its students and to align with institutional beliefs about best practices.

Key Findings of the Study

This report, prepared by NCPR, documents the implementation and early findings of the efficacy of eight developmental summer bridge programs in Texas. NCPR is a partnership funded by a grant (R305A060010) from the Institute of Education Sciences, U.S. Department of Education. NCPR includes the Community College Research Center at Columbia University's Teachers College, MDRC, the Curry School of Education at the University of Virginia, and faculty at Harvard University. NCPR conducts studies that

measure the effectiveness of programs designed to help students make the transition to college and master the basic skills needed to advance to a degree.

NCPR began its work in Texas by establishing a close, cooperative agreement with the THECB. A number of developmental summer bridge programs had received THECB funding and technical assistance for two years prior to beginning the research, resulting in a pool of colleges with experience in implementing these programs. Houston Endowment also was interested in increasing participation rates in college and became another partner in this study.

Following an intensive period of initial investigation into the kinds of programs offered around the state, eight colleges were selected to participate. NCPR worked closely with these colleges to recruit students who were defined as at-risk, that is, likely to be placed into developmental education when they entered college. Students were then chosen by random assignment to participate in the limited number of slots available in the eight programs. Students who participated in the programs, as well as those not selected to participate (who were instead assigned to the control group), were asked to allow researchers access to their enrollment and transcript data. Access to these data permitted researchers to assess whether participation in a summer bridge program would affect key student outcomes, such as enrollment in college, need for developmental education, academic performance, credit accumulation, and persistence. In addition, site visits were made to participating colleges to learn how the summer bridge programs were designed and implemented.

This report is the first of two that will be published related to this research. This report presents early impact results from the evaluation and information on how the developmental summer bridge programs were implemented. It focuses on the models used, the range of design features incorporated, how the programs were administered, and how they were perceived by those involved, including college and program leaders, faculty, advisors, and students. A cost analysis of the developmental summer bridge programs is also included. The following are the main findings of this preliminary report:

- All eight programs in the study were implemented with reasonable fidelity to the model framed by the THECB, but they varied on some key dimensions.
- Program costs averaged about $1,300 per student but varied widely.
- Program group students did not enroll in either the fall or spring semester at significantly different rates than control group students; enrollment rates were high for both groups.

- There is evidence that the program students were more likely to pass college-level courses in math and writing in the fall semester following the summer programs. The findings also suggest that program students were more likely to attempt higher level reading, writing, and math courses compared with control group students.

Organization of This Report

The following chapters provide greater detail about the study. Chapter 2 details the study's random assignment methodology and provides information on the sample characteristics. Chapter 3 provides information on program implementation, administration, and costs. Chapter 4 details participating students' experiences and perceptions. Chapter 5 discusses early impacts on selected outcomes. Chapter 6 provides a brief conclusion. A final follow-up report, due to be released in 2012, will provide longer follow-up on students and additional measures of the programs' effects.

Chapter 2

Study Methods

This chapter provides a chronological overview of the site selection process, a description of NCPR's collaboration with the THECB, and information on site visit activities, conducted during the summer of 2008, that facilitated final selection of sites. In addition, this chapter describes the random assignment process, introduces the students in the sample, and outlines the data sources for the study.

Site Selection

Criteria for the eligibility of programs to be included in the NCPR research were defined by the legislation that established the programs that were funded by the THECB (see Section 29.098, Texas Education Code). Because the THECB criteria did not require all programs to function the same way, program designs varied somewhat across colleges. For example, several colleges offered developmental summer bridge programs specializing solely in math, while others offered math, reading, and writing. It should be noted that five of the programs in this study were not funded by the THECB at the time of site selection, but the colleges still agreed to model their programs on the THECB criteria.

Site selection was an extensive and multi-phased process. NCPR searched for sites that met a set of criteria for potential inclusion in the study, specifically those that: (1) had offered developmental summer bridge programs for several years; (2) were able to serve large numbers of students; (3) offered programs targeted to students in need of remediation; (4) included accelerated coursework in developmental education (math, reading, and/or writing), academic supports, and a college knowledge component; and (5) were able and willing to participate in a rigorous evaluation of the program.

To identify possible college partners, we looked first at sites that submitted proposals in response to the THECB request for proposals for developmental summer bridge program funding in 2007 and 2008. We then conducted Internet searches for summer bridge programs at Texas colleges and universities and followed up with phone calls to program administrators to learn more about the programs and share information about the NCPR study. Finally, in the summer and fall of 2008 we visited the colleges that best met our criteria.

NCPR initially selected seven sites to participate in the study: El Paso Community College, San Antonio College, Texas A&M International University, St. Philip's College,

South Texas College, and Lone Star College campuses at CyFair and Kingwood.[1] To increase the number of students participating in the study, NCPR selected an eighth site, Palo Alto College, in February of 2009. Three of these sites' programs were funded by the THECB; the others were funded by the colleges themselves. All sites received additional program funding from NCPR.

In an effort to ensure that the programs were strong for summer 2009, NCPR offered technical assistance to all of the sites. One faculty expert on academic preparedness and remediation in community colleges worked with several colleges on creating strong summer bridge curricula. One institution requested that NCPR provide funds that would allow summer bridge instructors and tutors to work with a faculty member and expert on developmental mathematics education to review the curriculum and refine instructional practices. All of the participating institutions also attended a conference in which technical assistance was provided on various instructional, administrative, and recruitment issues related to the implementation of developmental summer bridge programs.

Data Collection and Analysis Design

The following provides a broad overview of the data collection plan and process used in the NCPR research, including sample criteria, size, recruitment, and random assignment procedures.

Sample Criteria

NCPR set a total recruitment goal of 1,400 students to ensure that the evaluation would be sufficiently powerful to detect relevant differences in outcomes as statistically significant. In other words, NCPR sought enough students in both the program and control groups to ensure that if the programs had a meaningful impact on students we would have the statistical power to know that those differences were caused by the programs and not by chance. The specific sample goals for each college in the study were based on several factors, including the capacity of the program, the number of students enrolled in the program in previous years, and the college's ability to maintain program quality at scale. These college-level enrollment goals, which ranged from 300 students (serving 180 students) to 75 students (serving 45 students), represented a large increase over the number of students served in previous summer terms for many of the institutions. Four of the sites met or exceeded their target numbers, two reached over 80 percent of their target numbers,

[1]The Lone Star College System (LSCS) runs summer bridge programs at several of its five campuses. NCPR partnered with two of the LSCS campuses, which were treated throughout the study as distinct sites.

and two reached over 50 percent of their target numbers. At the conclusion of the random assignment process, there were 1,332 students in the study (95 percent of the total target); this relatively small shortfall does not have any analytic implications for the study.

Recruitment

Recruitment was a major undertaking at all of the institutions, especially where sites had set high recruitment goals. For example, St. Philip's College, which had the highest target, enrolled 90 students in its developmental summer bridge program in 2008; the recruitment target (for program and control groups combined) for summer 2009 was 300 students — a 233 percent increase. Colleges had to scale up their recruitment efforts and their program offerings to meet their targets. To support these efforts, NCPR provided funding to the colleges, stipends to the students, and technical assistance. Institutions used their recruitment funds for a variety of purposes, including hiring additional recruitment staff, sending mass mailings to qualifying high school students, developing posters and brochures to distribute at high schools, and providing informational breakfasts or lunches for high school counselors. NCPR and the colleges believed that jobs and other stimulus-funded opportunities might significantly deter students from participation in the summer bridge programs. With NCPR funding from Houston Endowment, sites were able to offer students the opportunity to receive a $400 stipend; this feature was added as a core component of the program model. Program administrators believed that the opportunity to earn a $400 stipend was a major incentive for many students to join the study.

All eligible students who applied for admission into a developmental summer bridge program and agreed to participate in the study at participating institutions in the summer of 2009 were included in the research sample. About 60 percent of the students were assigned into the summer bridge program group (793 students) and 40 percent to the control group (525 students). Table 2.1 shows the numbers of students who entered the study from each participating college.

All colleges reached out to students who were likely to enroll (or were already registered) in the fall. In addition, some of the colleges devoted significant efforts to recruiting students who were undecided about college attendance in hopes that the summer bridge program could provide extra impetus for them to attend college in the fall.

Texas Developmental Summer Bridge Programs

Table 2.1

Program Enrollment at Participating Institutions in Summer 2009

Institution	Program (60%)	Control (40%)	Total Recruited	Target Recruitment	% of Target Recruitment
El Paso Community College	165	108	273	233	117
Lone Star College–CyFair	75	50	125	125	100
Lone Star College–Kingwood	52	35	87	75	116
South Texas College	83	55	138	167	84
Texas A&M International University	126	85	211	167	126
Palo Alto College	53	35	88	167	53
San Antonio College	91	61	152	283	54
St. Philip's College	154	104	258	300	86
Total	**799**	**533**	**1,332**	**1,517**	**88**

Intake and Random Assignment

While the institutions' program staff focused much of their energy on recruitment during the winter and spring of 2009, the NCPR research team created materials to help the sites navigate the complex student intake process. NCPR drafted intake flowcharts and developed individualized random assignment manuals adapted to the specific needs of each college and university, prepared the baseline information forms (BIF) and informed consent forms, and created an end-of-program survey for students. These materials were all shared and discussed extensively with the sites during regularly scheduled conference calls in the months leading up to the intake sessions.

Subsequently, NCPR research teams scheduled on-site training days for all partner sites. These visits included a review of random assignment manuals, training on computers for entering BIF information and navigating the online random assignment program, and informational sessions for college administrators interested in learning more about the NCPR study. The institutions distributed $30 gift cards to students who completed the BIF and went through the random assignment process.

Pooled Data for Analysis

While the programs varied in their delivery and implementation (as discussed in the following chapters), because all of the programs contained four common features — an accelerated format, a college knowledge component, academic support, and a stipend — NCPR pooled the data across all eight sites for analysis. Our site visits during the summer of 2009 allowed us to verify the presence of these four features, giving us confidence that the programs were substantially similar.

Characteristics of Participating Students

The students in the summer bridge programs were predominately Hispanic, recent graduates of high school, and willing to spend long hours in the summer studying to prepare themselves to enter college in the fall. (As one said, "I want to attend so I can take college classes and not remedial courses and waste money.") Based on student baseline data collected at the eight colleges participating in this study, the overall demographic and educational characteristics were very similar for the program and control groups. Importantly, an omnibus test for significant differences between the two groups found that there were no systematic differences between program and control group students on the set of background characteristics collected, confirming that the random assignment process successfully created two comparable groups of students. Table 2.2 indicates the characteristics of students in the sample.

While demographic characteristics were comparable between students in the program and control groups, they did vary among student populations by college. For example, as a result of recruitment efforts that targeted continuing education students as well as recent high school graduates, South Texas College had a considerably larger number of older students than did the other colleges. While most participating students at the other colleges were 17–19 years old, more than half of participating students at South Texas College were 19 years old or older. Additionally, approximately a third of students at South Texas College had children — a significantly larger proportion than at the other colleges.

In terms of race and ethnicity, El Paso Community College, San Antonio College, Palo Alto College, South Texas College, and Texas A&M International University served mostly (more than 90 percent) Hispanic students. At both Lone Star College–Kingwood and Lone Star College–CyFair, fewer than half of students were Hispanic (the balance was comprised of White; African American; and, to a lesser extent, Asian American students). All institutions served more females than males, with Palo Alto College having the most imbalanced gender ratio at almost 3:1.

Texas Developmental Summer Bridge Programs

Table 2.2

Participant Demographics

	Program	Control	All
N	793	525	1,318
Gender			
Female	62.5%	62.1%	62.4%
Male	37.5%	37.9%	37.6%
Age as of June 1, 2009			
Mean age	18.9	19.1	19.0
Age 18 or under	84.7%	84.8%	84.7%
Age 19 or 20	11.9%	10.1%	11.2%
Age 21 or over	3.4%	5.2%	4.1%
Race/ethnicity			
African American	6.8%	6.4%	6.6%
Hispanic	84.3%	84.2%	84.3%
White	8.8%	8.6%	8.7%
Other	1.8%	2.0%	1.8%
Educational aspirations			
High school	12.8%	11.8%	12.4%
Some college	1.5%	1.2%	1.4%
Certificate	1.7%	1.2%	1.5%
Associate degree	10.1%	11.2%	10.5%
Bachelor's degree	34.9%	34.8%	34.8%
Master's degree	34.9%	34.2%	34.6%
Doctoral or professional degree	3.2%	4.9%	3.9%
Educational attainment			
Previously attempted college credits	23.4%	25.5%	24.2%
Previously earned college credits	21.0%	21.4%	21.2%
Graduated high school	79.5%	80.0%	79.7%
2007 or earlier	1.5%	4.6%	3.3%
2008	1.9%	2.3%	2.0%
2009	72.4%	71.%	71.9%
Fall 2009 college attendance plans			
Full-time (4 courses per term or more)	77.6%	77.7%	77.6%

Table 2.2 (continued)

	Program	Control	All
Part-time (3 courses per term or less)	22.4%	22.3%	22.4%
Not planning to attend	0.0%	0.0%	0.0%
Texas Success Initiative (TSI)			
Met math TSI standards	20.2%	21.0%	20.5%
Met reading TSI standards	18.5%	16.4%	17.7%
Met writing TSI standards	39.5%	38.1%	38.9%

SOURCE: Self-reported by students on the Baseline Information Form.

NOTES: A student's scores on one of several placement tests (i.e., ASSET, COMPASS, ACCUPLACER, and THEA) determine whether the student meets the TSI minimum passing standard. A passing score on the TSI indicates that a student is ready to enroll in freshman-level academic coursework. While institutions may set higher minimum passing scores than the state does, this report relies on the cut scores established by Texas. There was no statistically significant difference between the program and control group students in any of the three areas (math, reading, or writing) at baseline. Although the total number of students recruited was 1,332, the total number of students in the sample with usable data who remained in the study was 1,318.

All students said that they planned to attend college — either part or full time — in the fall of 2009, the semester immediately following enrollment into the study. Since the colleges utilized different placement tests (ACCUPLACER, Texas Assessment of Knowledge and Skills, COMPASS, ACT, etc.) to determine developmental placement, we were unable to capture the degree of developmental need for each student. However, we were able to examine student scores on the Texas Success Initiative (TSI), a college readiness indicator used within the state of Texas.

Of the 1,332 students who participated in random assignment, 793 students were selected to participate in the developmental summer bridge programs at participating colleges, while 525 students were assigned to the control group. Among those selected to participate in the developmental summer bridge programs, a total of 689 students (86 percent) actually enrolled.

Data Sources

Several data sources were used for the analyses presented in this report. First, students completed a questionnaire called the baseline information form (BIF) prior to the random assignment process — that is, before they could be influenced by the program. The BIF collected demographic and other background information on students. Baseline data were used to identify students for gender-based subgroup analyses, in which the outcomes

for men and women were analyzed separately and compared to determine whether programs had different effects for men and women. Second, the eight colleges that held summer bridge programs provided student-level transcript data for the sample members (program and control) participating in the study. These data provided a detailed look at sample members' performance in college through measures such as enrollment status, credits attempted, and credits earned. Third, data were collected from the THECB. The THECB collects data on student enrollments statewide, including aggregate academic measures, such as the level of developmental courses attempted and passed. In addition, qualitative data were collected through interviews and observations conducted during two-day visits to each of the participating colleges during the summer of 2009.

Chapter 3

The Developmental Summer Bridge Program Models

This chapter describes the eight colleges and their summer bridge programs and discusses the four core components of the programs:

- accelerated instruction in math, reading, and/or writing;
- academic support;
- a college knowledge component; and
- a $400 student stipend.

This chapter reports the findings of our site visits, during which we observed how the program design at each college incorporated the expected program components and looked for indicators of high-quality implementation. This chapter also provides an overview of the management of the summer bridge programs, including information on the costs of implementing these programs.

The Colleges and Their Models

The eight institutions selected for inclusion in the study are El Paso Community College, Lone Star College–CyFair, Lone Star College–Kingwood, South Texas College, Texas A&M International University, Palo Alto College, San Antonio College, and St. Philip's College. Of their developmental summer bridge programs, four were course-based, while another four were freestanding. Course-based programs were based on standard developmental courses, modified or condensed to create a shorter, more intensive experience. Students enrolled in course-based programs also received additional academic supports, guidance in college knowledge, and a $400 stipend to supplement their summer course work. Students were typically awarded developmental education credit[1] (below the college level) for completion of these courses. Freestanding programs were designed to provide students the opportunity to advance multiple skill levels by offering basic skills instruction and were not based on a specific course. These programs did not require enrollment in a summer course and did not award any form of credit. A brief description of each college and its developmental summer bridge program is provided in the pages that follow.

[1]Developmental education credits are awarded for financial aid eligibility purposes but cannot be applied toward a degree.

El Paso Community College

El Paso Community College (EPCC) is an urban institution that was established in 1969. El Paso County Community College District includes five campuses; its developmental summer bridge program, Project Dream, was operated at four of the campuses. In fall 2008, EPCC had a full-time-equivalent enrollment of 15,201 students. The student population was about 85 percent Hispanic, 8 percent White non-Hispanic, and 2 percent African American. These percentages closely reflect the demographics of El Paso County.

Project Dream has operated since 2006 and runs for five weeks each summer. The program was one of three in the study to receive funding through a grant from the THECB for 2009–2011. Project Dream, a freestanding program, enrolled students in coursework in math and reading, as well as a Dream Class that incorporated writing, cultural awareness, and college knowledge. Program instructors, trained in pedagogy, worked to offer contextualized instruction. Program students were mentored by older college students.

Lone Star College–CyFair

Lone Star College–CyFair, established in 2003, is the newest of five campuses of the Lone Star College System (LSCS), which serves the suburbs of Houston. In fall 2008, Lone Star College–CyFair had a full-time-equivalent enrollment of 6,709 students. The student population in 2008 was about 40 percent White non-Hispanic, 30 percent Hispanic, 10 percent African American, and 10 percent Asian American.

The Summer Bridge Program has operated since 2006 and runs for four weeks. In this course-based program, students participated in one developmental education course in math, reading, or writing. All had placed into the highest-level developmental course in the subject area. Other important elements of the program included the presence of tutors in each class, the use of MyMathLab and MyWritingLab software, college knowledge workshops, and individually assigned mentors for every student.

Lone Star College–Kingwood

Lone Star College–Kingwood, which is also part of the five-campus LSCS, was established in 1984. In fall 2008, Lone Star College–Kingwood had a full-time-equivalent enrollment of 3,820 students. The student population at Lone Star College–Kingwood in 2008 was about 55 percent White non-Hispanic, 20 percent Hispanic, and 12 percent African American.

The college has offered the four-week Summer Bridge Program since 2006. The course-based program offered classes in math and writing, and students took only one subject. Students in the writing option had class for four hours per day, while those in math had class for three hours per day. Both options were for students whose placement test scores put them at the highest level of the developmental course sequence.

Important elements of the program included tutors who were present in each class and available to provide students with extra help before and after class, four one-hour workshops on study skills and college knowledge, and College Connection mentors with structured time to interact with students.

South Texas College

South Texas College, founded in 1993, is a community college that recently began to offer baccalaureate degrees. It is located in McAllen, Texas, near the border of Mexico. In fall 2008, South Texas had a full-time-equivalent enrollment of 12,644 students. The student population at South Texas is primarily Hispanic (about 95 percent). Interestingly, the Hispanic student population of South Texas College is higher than the proportion of Hispanics in the city of McAllen.

The summer bridge program, called Jumpstart, was established in 2007 (the program did not run in 2008). A freestanding program, Jumpstart runs for four weeks and focuses only on developmental math instruction. Significant elements of the program included weekly college knowledge workshops, use of MyMathLab to supplement instruction, tutors in the classrooms and labs, and daily journal writing to informally develop writing skills. Students in the math courses were grouped without regard for the level of remediation needed.

Texas A&M International University

Texas A&M International University (TAMIU) is a four-year institution that first started to accept students in 1970 and became a campus of the Texas A&M University System in 1989. It is the only university in the NCPR study and one of three institutions in the study to receive funding through a grant from the THECB. Located in Laredo on the border of Mexico, TAMIU has a heavily Hispanic student population (over 90 percent). In fall 2008, TAMIU had a full-time-equivalent enrollment of 4,222 students.

The freestanding summer bridge program at TAMIU started in 2007. In previous summers, the program offered English and math, but for the summer 2009 program, the staff decided to focus solely on developmental math instruction with all levels mixed together in each section. The program was called Intensive College Math Prep. In addition

to the intensive, accelerated math instruction, other important elements of the program were tutor-administered math lab hours, weekly meetings with older-student mentors, and weekly college knowledge presentations. The program ran for five weeks.

Palo Alto College

Palo Alto College, a member of the Alamo Community College District (ACCD) in San Antonio, was established in 1983. In fall 2008, the college had a full-time-equivalent enrollment of 4,486 students. The student population in 2008 was about 66 percent Hispanic, 30 percent White non-Hispanic, and 2 percent African American. The demographics of Palo Alto College closely resemble those of greater San Antonio, where 59 percent of the population are Hispanic or Latino of any race.

In the past, Palo Alto College ran summer bridge programs that focused on SAT/ACT preparation. In the summer of 2009, Palo Alto College started the Early Start program, which offered only developmental math in a course-based format. Students attended class for four weeks. Distinctive features of the program included tutors in each class, provision of breakfast and lunch to all students, a cohort model, and a student development course.

San Antonio College

San Antonio College, also a member of ACCD, was established in 1925 and in fall 2008 had a full-time-equivalent enrollment of 12,226 students. The student population is about 48 percent Hispanic, 42 percent White non-Hispanic, and 5 percent African American. The summer bridge program at San Antonio College, established in 1999, is called Senior Summer.

Senior Summer allows students to enroll in developmental math, reading, and writing as well as college-level courses. Participating students chose two courses from the regular college summer offerings. The program ran three and a half hours per day for five weeks, with an additional hour two days each week. The program staff emphasized that they recruit students who are often overlooked as "college material." Important elements of Senior Summer included enrollment in actual developmental-level courses, a pared-down version of a student development course, assistance with financial aid forms, and fostering college-going attitudes among students.

San Antonio College had difficulty recruiting students for the 2009 summer program. In previous years, program staff had worked closely with individual students during the recruitment process to provide assistance in completing financial aid forms, which is a key part of this course-based program because students pay tuition. Because of

the random assignment design, it became more complicated to work effectively with individual students.

St. Philip's College

St. Philip's College, another ACCD member in San Antonio, is a historically Black college and Hispanic-serving institution that was founded in 1898 and became a public two-year institution in 1942. In fall 2008, St. Philip's College had a full-time-equivalent enrollment of 5,533 students. The student population is about 47 percent Hispanic, 34 percent White non-Hispanic, and 16 percent African American. The freestanding summer bridge program is called the Fresh X Summer Program.

The Fresh X program provides developmental education instruction in math, reading, and writing. Students took courses in one, two, or all three developmental subject areas based on remediation needs as indicated by ACCUPLACER[2] test scores. The contact hours of the program varied depending on the number of courses taken. The program ran five days per week for four weeks. Fresh X was marketed as an ACCUPLACER refresher course, and the goal of the program was to improve students' scores on the test. The instruction was heavily focused on passing the test as a result. Other important elements of the Fresh X program included support from the math, writing, and reading labs; a credit-bearing student development course; and use of adaptive learning software to supplement math instruction.

Developmental Summer Bridge Program Features

The goals of each summer bridge program were primarily achieved through the teaching and learning that occurred in the classroom and the various support structures. In most cases, faculty, tutors, and mentors worked together with the goal of facilitating student learning. Bundling an array of services into the programs and actively bringing those services to the students — or being "intrusive," as one program administrator described it — features prominently in the underlying theory of change for the summer bridge program model. Teaching and learning at each site were directly influenced by the structure of the summer bridge program. Each of the core features — accelerated instruction in math, reading, or writing; academic support; the college knowledge component; and the student stipend — functioned together to deliver a coherent learning experience. Though there were many common elements across the eight programs, each program also had unique features to accommodate the institution's student population or, in some cases, to fit with the

[2]ACCUPLACER is an adaptive placement test developed by the College Board.

academic calendar or institutional culture. This section describes each of the four core program features in detail.

Accelerated Instruction in Math, Reading, and/or Writing

All sites offered developmental education instruction in an accelerated format, with some degree of contextualized learning and active learning. Formats, schedules, and content differed from site to site and were influenced by the subject areas taught, as well as by program goals. South Texas College, TAMIU, and Palo Alto College offered only math; Lone Star College–Kingwood offered math and writing; and St. Philip's College, EPCC, Lone Star College–CyFair, and San Antonio College offered a combination of math, reading, and writing. A few programs offered one developmental subject (e.g., math) but taught students of different developmental levels together in a freestanding program.

The length and intensity of the developmental summer bridge programs also varied, as shown in Table 3.1. The minimum time required to complete a program was about 35 hours for a student taking only one subject at St. Philip's College; a large majority of the college's students, though, took two classes for over 50 hours of program time. Conversely, students enrolled at EPCC or TAMIU spent approximately 100 hours on campus. These hours represent required time at the college and do not include hours spent on homework or group project assignments.

Instructors appreciated the flexibility offered by the freestanding programs. Freestanding programs could be structured in the ways that program coordinators and faculty members thought best, without needing to follow pre-established curriculum guidelines. As one faculty member from EPCC stated, "I think what makes this program neat is that it is different from a [regular developmental] class because you are allowed to kind of step out of the box and be a little more creative with what you are doing, as opposed to having to follow the syllabus." A student at EPCC saw this flexibility as a way to smooth the passage between high school and college and commented, "It's not a hardcore college class, but not high school either. … It makes the transition easier."

Student assessment practices also differed between the course-based and freestanding programs. As with a standard developmental course, students enrolled in course-based programs were graded based on performance; students who earned a C or better earned developmental credit and were allowed to advance to the next course in the sequence. In contrast, students in freestanding programs were not given traditional grades. Rather, they worked toward retaking and passing the institution's placement test (COMPASS, ACCUPLACER, etc.) at the end of the program. All programs were designed to help developmental students advance at least one level of proficiency during the program.

Texas Developmental Summer Bridge Programs

Table 3.1

Structure of Developmental Summer Bridge Programs

Institution	Hours	Weeks	Course-Based	Levels Below College Level	Student Ability Levels	Subjects Offered
El Paso Community College	100	5	No	All	Mixed	Math, Reading, and Writing
Lone Star College–CyFair	67	4	Yes	1	Not Mixed	Math, Reading, and Writing
Lone Star College–Kingwood	64 (Math) 52 (English)	4	Yes	1	Not Mixed	Math and Writing
South Texas College	80–100	4	No	All	Mixed	Math
Texas A&M International University	100	5	No	All	Mixed	Math
Palo Alto College	60–76	4	Yes	2 and 3 (lowest)	Not Mixed	Math
San Antonio College	Approx. 97	5	Yes	All	Not Mixed	Math, Reading, and Writing
St. Philip's College	Approx. 35–95	4	Yes	All	Mixed	Math, Reading, and Writing

Program administrators generally believed that the accelerated format offered students a chance to quickly increase their readiness for college. A number of faculty members concurred, believing that there were clear instructional advantages to focusing on one or two subject areas exclusively for a short period of time. However, others found this format to be pedagogically challenging. Some faculty remarked that a summer program is not ideal and believed that lower achieving students struggled with the intensity of the

work. One math faculty member stated, "A lot of these students have tested in 0300, which is integers … middle school math! They need more math, not less." In addition, some instructors expressed frustration with teaching the students all of the necessary course material within a shortened time frame.

Faculty in the course-based programs taught the standard developmental course at an accelerated pace typical of summer courses in general. The summer bridge programs did not provide modified software, textbooks, or materials to accommodate the shortened time frame. If students successfully completed the coursework, they became eligible to advance to the next level without retesting. Faculty in the freestanding programs expressed both positive and negative views on teaching students of multiple ability levels in a single classroom, especially about the benefits and drawbacks of this arrangement for the lowest level students. A South Texas College math faculty member commented, "It doesn't affect me. … I start at the very bottom in any case. Everyone makes progress together. This seems to work well." However, another South Texas College math instructor feared that this arrangement would hurt the lowest level students' chances of passing. Institutions utilized different methods of addressing this challenge. For example, EPCC had mixed-ability math and writing classes for most of the day, followed by groupings according to reading ability for a portion of instructional time. This approach allowed the lower ability students to work on basic reading skills while their higher ability peers discussed a book they were reading outside of class.

Academic Support

Academic support was an important part of the developmental summer bridge programs, not only because it supported the instructional component but also because it helped to integrate students into the life of the program and the college. This support generally took the form of tutoring, mentoring, or access to learning labs and computer-based programs (see Table 3.2). The math programs generally utilized some form of mandatory computer-aided instruction and independent practice. Some of the reading and writing programs did so as well. Three programs provided students with a subscription to MyMathLab, and two programs utilized Assessment and Learning in Knowledge Spaces (ALEKS). Students spent part of their day on campus working through individualized lessons targeted to their specific needs, and teachers were able to keep track of the students' progress virtually. If students had Internet access outside of the school, they could log on remotely, but this was not required by any of the programs.

South Texas College took this approach one step further and utilized MyMathTest (created by the same company as MyMathLab) as a substitute for their textbook. Although this worked well for some students, others — especially those without Internet access at

home — expressed a desire to have a physical textbook so that they could work independently at home. One student without home Internet access said she was "try[ing] to write as much notes as possible because we don't have the book at home."

Texas Developmental Summer Bridge Programs

Table 3.2

Academic Support at Each Participating Institution

Institution	Academic Support
El Paso Community College	Mentoring program; mentor assigned to each class; structured time with mentors
Lone Star College–CyFair	Mentoring; tutor assigned to each class 4 hours per week
Lone Star College–Kingwood	Tutors present for entire time of each class; structured time with mentors
South Texas College	3 tutors and an estimated 3–4 hours per week of lab time
Texas A&M International University	Involvement with mentors, tutors, academic support advisor, and program director
Palo Alto College	Tutors in class; mandatory daily tutoring sessions
San Antonio College	Tutoring and lab time available on a voluntary basis
St. Philip's College	Use of labs and tutoring

San Antonio College and St. Philip's College were the only two colleges that did not provide tutors as part of the summer bridge program; however, San Antonio College encouraged math students to spend 10 hours per week in the math lab, where tutoring was available. The other six programs provided various forms of tutoring. For example, Lone Star College–CyFair assigned a tutor to each class for four hours per week. Lone Star College–Kingwood had a tutor in every classroom for the entire class period. South Texas College had three tutors roaming between five classes. TAMIU had two or three tutors

present in the classroom as well as in each computer lab while the students were completing their lab work. A math faculty member at Palo Alto College, in response to a question about the single most important element of the program, replied, "I think it is the tutoring time. [Students] are forced to do their homework. If not forced, some would not do their homework. I think it enhances the course. That is going to make it a success." Many instructors stated that requiring students to practice newly acquired skills at a set time during which help was accessible was important to program success.

Lone Star College–Kingwood specifically chose tutors who could relate to the students (e.g., tutors who were approximately the same age as students, or tutors who were present or former Lone Star College–Kingwood students) rather than professional tutors with master's degrees in an effort to increase students' comfort. These tutors, present for the entirety of every class, modeled academic skills, such as note-taking. The tutors felt that this was particularly effective because students could compare their notes to those taken by the tutors. By minimizing the distinction between student and tutor, the tutors often became academic models or mentors to the students.

Structured mentoring was utilized as an explicit program component in four of the summer bridge programs (i.e., EPCC, TAMIU, Lone Star College–CyFair, and Lone Star College–Kingwood). Mentoring was one of the methods that colleges used to connect and engage students with the college and its resources. The two Lone Star Colleges assigned their College Connection[3] advisors as mentors, since these individuals had extensive experience in high schools. These institutions did not have a structured training program or predetermined topics for the mentors to cover with students. Consequently, the quality and intensity of the mentoring varied according to the individual mentor. Faculty at Lone Star College–CyFair reported not knowing who individual students' mentors were; thus, mentors could not be contacted when a student was having difficulty. TAMIU and EPCC had strong mentoring programs with specific meeting times and topics identified in advance in consultation with program supervisors. This structure appears to have maximized the effectiveness of the time students spent in advising sessions.

College Knowledge Component

In this paper, college knowledge instruction is defined as the provision of information about localized college contexts (e.g., tours, available student services, etc.), college expectations (study skills, faculty norms, time management, etc.), college planning (course-taking, plans for transfer), aligning educational goals with career plans, and paying for college. All programs in the study provided some explicit means to help students gain

[3]College Connection advisors are used throughout the state to assist high school students in the transition to college.

college knowledge, but the specific content and delivery method varied (see Table 3.3). Content was formally delivered in one of two main ways. Three programs (Palo Alto College, San Antonio College, and St. Philip's College) utilized a modified version of a student development (or "student success") course of the type generally offered to new college students. These courses were often taught by college advisors and had a designated time slot in the day's schedule. The other five programs (i.e., South Texas College, Lone Star College–Kingwood, Lone Star College–CyFair, TAMIU, and EPCC) provided presentations focused on different topics (e.g., financial aid, career assessment, etc.). Colleges generally offered four or five one-hour presentations, once per week. These presentations were not generally integrated into the curriculum and were taught by either advisors or mentors. The mentors at the two Lone Star Colleges conducted the four presentations on college knowledge, allowing for greater continuity between the overall program goals and the college knowledge component than in some of the other programs. According to the end-of-program survey, students appeared to value the abbreviated student success courses more than the presentations, which they sometimes found to be disconnected from the rest of the program.

College knowledge can be divided into social and academic components. In the developmental summer bridge programs, academic knowledge was stressed more than social knowledge. The programs covered a variety of topics in academic college knowledge, including study and test-taking strategies, time management, career assessment, learning styles, tours of the campus, introduction to college resources, financial aid, and course or degree plans. The information needed to make the social transition to college was covered to some degree in all summer bridge programs. Students in the programs received instruction in social college knowledge topics, such as personal financial responsibility, motivation, behavioral expectations, and techniques for dealing with stress.

Although the colleges provided formal courses and sessions, college knowledge was also imparted informally. Many faculty members and tutors informally integrated information about how to navigate college into the classroom or hallway conversations. For example, faculty members would comment on the differences, both academic and social, between high school and college. As one TAMIU faculty member noted, "[We] tell them from day one that they are college students and in college." Explicit statements like these helped to communicate to students that they were in a more demanding academic setting and were expected to act accordingly. Tutors gave tips on study skills and how to anticipate what a faculty member might ask on a test. TAMIU and EPCC mentors and students spent much of their scheduled time together focused on college knowledge topics, such as advising and registration.

Texas Developmental Summer Bridge Programs

Table 3.3

College Knowledge Components at Each Participating Institution

Institution	College Knowledge Components
El Paso Community College	Dream Class; college knowledge presentations
Lone Star College–CyFair	Career assessment; use of Productivity Environmental Preference Survey (PEPS) to identify learning styles; one-on-one orientation given by mentors
Lone Star College–Kingwood	4 workshops run by mentors; individual meetings with mentors
South Texas College	4 presentations on college success
Texas A&M International University	4 presentations on college success; assistance with applications and financial aid; regular individual meetings with mentors
Palo Alto College	Student development course (1 credit); assistance with financial aid; use of *Que Pasa?* text
San Antonio College	Student success course (1 credit)
St. Philip's College	Student development course (1 credit)

Stipend

Students had the opportunity to earn up to $400 upon successful completion of the developmental summer bridge program. This incentive was built into the program design to boost recruitment and increase the likelihood that students would complete the program once enrolled. Our plan called for the first payment of $150 to be disbursed to students at the end of the first week of the program. The balance of $250 was to be paid out to students who successfully completed the program. Each college defined successful completion on its own. For example, Lone Star College–Kingwood defined successful completion as receiving a grade of C or better and having missed no more than three days of class during the program.

Administrators believed that the $400 stipend was a powerful recruitment tool, and student feedback confirmed this. Some students stated that the funds offset the need to work

more hours, while others perceived the stipend as a kind of bonus. In addition, both program administrators and students saw the stipend as contributing to program completion. One student indicated that knowing the stipend was there helped him to get up and make it to class in the morning.

Though all students who qualified were paid $400, the initial payment was almost universally delivered a week or two late due to various bureaucratic difficulties. The delay resulted in a number of student complaints and inquiries about the stipend. When asked about the effect of the stipend, one student pointed out that "we haven't received any of it yet — but we're still liking [the program], so that's good." Some students admitted that they experienced hardship because they did not receive the funds on time, but attrition from the program was not significant. Overall, students and administrators reported that the stipend helped to draw students to the study and induced eligible students to attend and complete the summer bridge program.

Administering Texas Developmental Summer Bridge Programs

This section provides an overview of the administration of the developmental summer bridge programs. It outlines the organizational features of the programs and how they relate to the colleges, as well as the types of administrative support offered by each of the colleges. Additionally, this section describes the recruitment and hiring of key staff, including faculty, mentors, and tutors. It then examines the types of support that college faculty offered to the program. This section concludes with a program cost analysis.

Organizational Location Within the College

In general, the developmental summer bridge programs were not part of the departmental education structure within colleges (see Table 3.4). Because these were special programs serving students before they officially entered college and because five programs included instruction in more than one subject area, nonacademic staff generally held leadership positions. The only programs run by faculty were the ones at South Texas College and TAMIU, although EPCC's program was codirected by a faculty member. It is possible that the presence of nonacademic staff in leadership roles resulted in a greater emphasis on program structure and student support than on instructional innovation.

Texas Developmental Summer Bridge Programs

Table 3.4

Program Management at Each Participating Institution

Institution	Program Management
El Paso Community College	Codirected by director of Student Success and a faculty member
Lone Star College–CyFair	Run by director of Outreach and Retention
Lone Star College–Kingwood	Run by dean of Student Development with a part-time coordinator
South Texas College	Run by a math (non-developmental education) faculty member; overseen by associate dean of Community Engagement and Workforce Development
Texas A&M International University	Run by a developmental English faculty member; overseen by the executive director of Programs for Academic Support and Enrichment
Palo Alto College	Run by Gateway to College coordinator; overseen by vice president of Student Affairs
San Antonio College	Run by off-site coordinator and student support specialist of Evening, Weekend and Distance Education (EWDE); overseen by dean of EWDE
St. Philip's College	Run by three members of the First Year Experience Center; overseen by the center's dean

Internal College Support for Programs

Leaders at participating colleges expressed great concern about both the number of students who test into developmental education and the need to broaden access to college. College leaders had a particular interest, expressed in a variety of ways, in meeting the needs of the local community and increasing college attendance and success rates among Hispanic students. The dean at one college was a former migrant farm worker with a strong personal commitment to improving opportunities for the next generation. In other cases, the desire to increase access to and success in college was closely tied to community development goals.

Program Planning, Implementation, and Oversight

The management of summer bridge programs was typically labor-intensive, and participation in the NCPR research added to the amount of work involved. Most notably, identifying and recruiting student participants posed a challenge, and significant efforts were made to promote the programs at local high schools. The need to accept applications from more students than any given program could accommodate (to permit the use of an experimental research design) only added to the pressure on program staff. However, NCPR supported the sites in this effort and hired a consultant to work with the sites based in Houston (Lone Star College–CyFair and Lone Star College–Kingwood) and San Antonio (Palo Alto College, San Antonio College, and St. Philip's College). Together, NCPR and the consultant offered sites ideas to boost recruitment, help in developing promotional materials, and assistance with the random assignment process. NCPR also encouraged the sites to forge close ties with high schools and adopt an active approach to recruitment, rather than simply marketing the programs and expecting students to apply. It seems likely that many more students learned of the summer bridge programs than in the past and that more disadvantaged students were reached.

Apart from the student recruitment effort, management of these programs was handled without major difficulties. The college units in charge were experienced in the management of these initiatives and similar initiatives, and all had run summer bridge programs for at least two years prior to the summer of 2009.

Recruitment Linkages with Other Organizations

Recruitment efforts for developmental summer bridge programs were enhanced in settings in which there was a strong connection between the college and its feeder high schools. As noted above, recruitment was conducted primarily at local high schools. Strong relationships with high school counselors allowed the colleges to reach students and market the programs. Counselors are in a good position to refer the students who they feel can benefit the most from the summer bridge programs. In fact, 40 percent of the developmental summer bridge participants indicated that they had learned about the programs from their high school counselors. Many of the colleges in this study were recipients of College Connection[4] grants that enabled them to regularly send staff to the high schools. The College Connection staff were typically trusted by students and high school guidance

[4]College Connection, funded by the THECB, supports the state's Closing the Gaps by 2015 initiative by (1) building awareness among high school seniors of the importance of a college education; (2) increasing rates of participation in higher education by providing students with assistance at multiple stages of the college entry process, including admission, financial aid application, and enrollment; and (3) increasing the number of students who successfully complete the transfer application process to the four-year institutional partner.

counselors and were already interacting with students on a regular basis. Thus, they were well positioned to present the summer bridge programs at college fairs, make presentations in classrooms, and pave the way for regular summer bridge program staff to contact students.

In a few cases, linkages between the college and community organizations were also important. Additional recruitment was possible in these settings mainly via posters and flyers.

Faculty Recruitment and Preparation

The process of hiring of faculty for the developmental summer bridge programs varied considerably between colleges. Palo Alto College and Lone Star College–CyFair went through a careful process to hire highly skilled, engaged faculty for the developmental summer bridge programs. At these colleges, program leaders expressed a desire to find faculty who would create a comfortable learning environment for students. Additionally, administrators looked for professors who were fun, lively, and technologically savvy. As one administrator from Palo Alto College stated, "[We were not looking for] lecture instructors or multiple-choice instructors."

The remaining colleges did not handpick their faculty. Selection to participate in developmental summer bridge programs generally occurred at the last minute, leaving little to no time for preparation; in some cases, faculty positions were given to any faculty member who wanted to teach during the summer.

Mentor Recruitment and Preparation

Mentors were involved in the programs at four of the eight participating colleges. Mentors were generally selected based on their ability to relate their own personal educational experiences and college knowledge to the participants' experiences. For example, at EPCC, one mentor stated, "It's about being a peer to them. It allows you to connect to them on a more personal level so that you can understand their learning styles better than a professor would." The mentors selected often had previous experience with developmental summer bridge programs, either as mentors, students, or recruiters.

At least two participating institutions (EPCC and TAMIU) offered specialized training to mentors prior to the start of their developmental summer bridge programs. However, in the case of EPCC, several of the mentors had not yet been hired at the time of training.

Tutor Recruitment and Preparation

The hiring of tutors, like the hiring of faculty and mentors, also varied across colleges. The program coordinators generally vetted all tutors. The selection of tutors was similar to the selection of mentors: primary consideration was given to applicants who were roughly the same age as participating students and who possessed strong subject matter knowledge in math, reading, or writing. As a representative at Lone Star College–Kingwood noted, "Proximity in age increases comfort level." In some cases, tutors were required to have an understanding of algebra in addition to other kinds of specialized knowledge. Like mentors, tutors were expected to informally help participants with adjusting to life in college.

Faculty Support

Support from involved faculty for the developmental summer bridge programs varied more than administrative support. Faculty members who were selected based on their fit for developmental summer bridge programs were generally enthusiastic about the programs — yet there were some exceptions. For instance, faculty members at one college questioned the value of the developmental summer bridge program. Nonetheless, the majority of faculty were characterized by program administrators as gracious, supportive, invested, and involved. Many faculty members, including some who were hired at the last minute, demonstrated strong support for the programs' aims.

Summary

The administration and organization of the developmental summer bridge programs varied across colleges, but our qualitative research suggests that the program administrators implemented these programs in ways that were largely consistent with a program model framed by the THECB and complying with the expectation of NCPR for the inclusion of specific program elements.

Program Updates: Summer 2010

In 2010, five of the eight colleges ran developmental summer bridge programs similar to those they offered in 2009. At each of these sites, program size was considerably smaller, in large part because the colleges lacked NCPR funding and because institutional budget cuts constrained program capacity. Recruitment also presented challenges for the colleges, since none of the programs were able to offer the $400 stipend provided in 2009. Two colleges offered a stipend of up to $200, one college offered tuition reimbursement,

and another college provided books and calculators for regular attendance, but the financial incentive to students was in no way comparable to that of 2009.

Colleges did learn a variety of recruitment techniques by way of their participation in the 2009 study. In particular, administrators remarked that direct contact with the high schools is integral to any college recruitment effort. As a result, College Connection advisors played a key role in recruiting 2010 summer program participants. One program administrator believed that the reputational success of the 2009 program aided in recruiting participants for the 2010 program.

While most of the colleges did not change their instructional offerings in significant ways, there were some notable changes. One college added a developmental reading course to its program, while another institution revised all reading and writing curricula within its freestanding program. A few colleges changed their math software programs or provided more training for mentors and tutors. One college also provided faculty development in 2010 for the first time.

The three colleges that did not offer programs in 2010 cited diminished resources as the primary reason for eliminating them. Each of the colleges decided to devote their limited resources and primary attention to strengthening other college readiness or developmental student success programs (e.g., career academies, success courses for students in developmental math, success courses for students on academic probation, etc.).

Program Costs

NCPR performed an analysis of the cost of the developmental summer bridge programs in order to be able to eventually perform a cost–benefit or cost-effectiveness analysis. However, for the purposes of this report, it is useful to understand the costs associated with running programs of this kind. The costs of the developmental summer bridge programs were calculated using the ingredients method (Levin & McEwan, 2001). Information on costs was collected from responses by program staff to a standard questionnaire devised for the developmental summer bridge program.[5] The main costs were for staffing (instructors, managerial staff, and administrative staff) and for the student stipends (approximately $400 per participating student). None of the colleges applied a direct cost-recovery formula for overheads to the program, so a uniform rate of 30 percent

[5]The questionnaire included 10 components, with information collected on participation rates; program duration; teaching staff; non-teaching, administrative, and recruitment staff; in-kind resources; course preparation; materials, facilities, and overheads costs; funding sources; tuition and fees; and any other expenses. Wage estimates include fringe benefits (if incurred). The questionnaire form is available on request.

was applied on all direct costs.[6] For simplification, we divided the cost ingredients into four groupings: staffing; other costs; student resources; and overhead. All figures are presented in 2009 dollars.

This report contains information about the developmental summer bridge programs and data on our four cost ingredients across each of the developmental summer bridge sites. From these we can calculate the total cost and the cost per admitted student (not all of whom actually entered or completed the programs). Table 3.5 summarizes the total costs for each of the eight sites and the average across all eight sites. Across the eight sites, approximately one third of costs were for staffing and just over one quarter for student resources. Total costs ranged from $62,633 to $296,033 per college, which reflects the significant variance across sites in program enrollment, duration, and intensity. In addition, Table 3.5 shows the average overall cost per participant. Across the eight sites, the average per-student cost ranged from $840 to $2,349. The average per-student cost across all eight sites was $1,319; this is the expected resource requirement needed per student to offer a developmental summer bridge program.[7] Unsurprisingly, there is no strong evidence of economies of scale in terms of numbers of students enrolled; the high-value stipend is a constant for each student.

[6]The 30 percent overhead rate is based on review of overhead rates applied at colleges across the United States. We test for sensitivity to the overhead rate below.

[7]Some costs may be interpreted as start-up costs and so are unlikely to be needed if the programs are run in subsequent years. If these costs are amortized over three years, then the average cost of the programs is reduced.

Texas Developmental Summer Bridge Programs

Table 3.5

Program Costs

	El Paso Community College	Lone Star College–CyFair	Lone Star College–Kingwood	South Texas College	Texas A&M International University	Palo Alto College	San Antonio College	St. Philip's College	Average Across Sites
Students admitted to program	165	75	52	83	126	53	91	154	
Cost per student									
Staffing[a]	$504	$222	$393	$418	$726	$278	$587	$168	$426
Other costs[b]	$68	$183	$425	$165	$570	$365	$97	$175	$235
Student resources[c]	$414	$238	$424	$451	$512	$357	($38)	$373	$354
Overhead	$296	$193	$373	$310	$542	$300	$194	$215	$304
Cost per student admitted	$1,282	$835	$1,615	$1,343	$2,349	$1,299	$840	$930	$1,319
Total cost	**$211,512**	**$62,633**	**$83,963**	**$111,463**	**$296,033**	**$68,853**	**$76,458**	**$143,218**	**$123,160**

NOTES: [a]Includes instruction, coordination, and recruitment. [b]Includes program preparation, facilities, and learning resources. [c]Includes stipends net of fees and meals.

Chapter 4

The Student Experience

In this chapter, we provide information on the students — both those who participated in developmental summer bridge programs and those who did not. We first offer insights into the experiences of students who were not among the 60 percent of our sample admitted to developmental summer bridge programs in the summer of 2009. Then, we discuss the characteristics, experiences, and outcomes of students who participated in the program. With our qualitative inquiry, we sought to understand patterns of program participation and to ascertain if programs met the perceived needs of student participants.

The Control Group Student Experience

While students in the control group were not tracked as closely during the summer of 2009 as their counterparts in the program group, student baseline data and summer course enrollment data from the eight colleges participating in this study make it possible to provide an approximate account of their summer experience. Their experience represents the "business-as-usual" comparison for the evaluation, indicating what students would do if not offered the opportunity to enroll in a developmental summer bridge program. Based on student data collected during the intake and random assignment process, 70 percent of the students in the control group indicated that if they were not accepted into a developmental summer bridge program, they would be likely to work. Twenty-two percent of control group students indicated they would enroll in a different educational program at the college where they applied for admission to a developmental summer bridge program. Eight percent of control group students suggested that alternative plans for the summer of 2009 included enrolling in an educational program other than those offered at their college of random assignment. Other students responded that they would attend summer school for classes (3 percent) or engage in studying on their own or with others (5 percent).

Summer enrollment data from the eight participating colleges, summarized in Table 4.1, show that 16 percent of students in the control group actually enrolled in a course at the college where they were applied for admission to a summer bridge program sometime during the summer of 2009. Generally, summer course enrollment rates were higher among control group students at colleges that offered course-based developmental summer bridge programs (i.e., Lone Star College–CyFair, Lone Star College–Kingwood, Palo Alto College, and San Antonio College) than at those that offered freestanding developmental

summer bridge programs (i.e., EPCC, St. Philip's College, South Texas College, and TAMIU), possibly due to differences in student recruitment strategies at the colleges.

Texas Developmental Summer Bridge Programs

Table 4.1

Percentage of Study Participants Enrolled in One or More College Courses During the Summer 2009 Term

Institution	Program Group (%)	Control Group (%)	*N*
El Paso Community College	2.4	9.3	273
Lone Star College–CyFair	90.5	33.3	122
Lone Star College–Kingwood	90.2	37.1	86
South Texas College	16.9	24.1	137
Texas A&M International University	0.8	3.5	211
Palo Alto College	92.3	8.6	87
San Antonio College	59.6	36.2	147
St. Philip's College	92.2	4.9	255
Total	**47.2**	**16.0**	**1,318**

The Program Group Student Experience

Data from the student baseline and post-program surveys, as well as comments made by students who participated in focus groups, illuminate the experience of students in the program group. The subsequent sections look at students' motivation and goals, experiences with the program, engagement, and overall satisfaction.

Student Motivation and Goals

Student responses on the program intake form and in on-site focus group interviews conducted during the summer bridge programs indicate that students generally shared similar goals and motivations in seeking to participate in these programs. Most commonly, students who enrolled in the developmental summer bridge programs aimed to (1) prepare for college, (2) improve their academic performance, and (3) improve their performance on

standardized tests. Many students also suggested that they felt the developmental summer bridge programs would facilitate achievement of their long-term education and career goals.

Students believed that participating in a developmental summer bridge program would help them prepare for college in a number of ways, particularly by helping them to become college-ready more quickly and allowing them to avoid taking remedial classes during their first year of college. Students commented during focus group sessions: "I didn't want to take any remedial classes," and "[my primary goal in the program was to] just get a higher grade and … not to take the remedial classes." Additionally, students indicated that they were motivated by the desire to "get a feel for what college is like" and "gain experience about college."

Students also aspired to improve their academic and standardized test performance through participation in a developmental summer bridge program. While various academic subjects — primarily math, reading, and writing — were mentioned by students in focus group sessions as target areas for improvement, developing better skills in math seemed to be of particular concern for many. As one student explained, "I needed the help in math really bad. I really knew I need it [*sic*], so much more than it was my choice, it was almost a necessity." Students generally saw participation in a developmental summer bridge program either as an opportunity to learn and understand classroom material with which they struggled previously, or as a "refresher." One student described participation as a way to "catch little things that I missed here and there, take my time more."

Notably, some students in focus group sessions expressed that the $400 stipend offered for completing a developmental summer bridge program did not play a major role in their decision to pursue program participation. For these students, the opportunity to take remedial courses at low or no cost served as sufficient motivation for program enrollment. The financial incentive did, however, encourage many students to attend all required classes. According to one student, the financial stipend "motivates you kind of, like, to go to first period because they tell you if you don't go to all your classes, you're not going to get it. So it kind of makes you. Because if it was up to me, I wouldn't go to specific classes."

Accelerated Format of Program

Many students identified the accelerated time frame in which the developmental summer bridge programs took place as a central aspect of their experience. Students mentioned during focus group interviews that they felt the rigor of the classes stemmed not simply from the content but also from the increased workload and expectations of the

accelerated summer programs. In a focus group interview, one student stated, "Missing one day here would be like missing a whole week in high school."

Similar sentiments were voiced by several other program group students. While many liked the accelerated pace of the classes, some noted that the workload was greater than in high school. One student stated, "I like the fast pace because you won't forget something from one class to the next," while another noted, "It's a lot more work. … It's a lot more serious. You only have five weeks and you only have three tests." Students were especially cognizant of how the fast pace affected instructional practices. Some commented that teachers sometimes seemed rushed or flustered in their attempts to get through the course material.

College Knowledge/Preparation for College

Many students appreciated how the programs prepared them to successfully navigate the college landscape. When asked in one focus group if they were feeling better prepared for college, student responses were overwhelmingly affirmative. One student stated, "Our student development teacher brought us to the library and showed us how to use resources." In terms of college knowledge, students also mentioned learning how to register for courses, where to go for advising services, how to set appropriate goals, how to obtain help with improving basic skills, and how to take advantage of tutoring services. Although not all participants were enthusiastic about the college knowledge workshops and presentations, many students remarked that they felt better prepared to utilize campus resources and to navigate the college bureaucracies after program completion.

Student–Faculty Relationships

The opportunity to develop closer personal relationships with instructors was another factor that shaped program student experiences. As one student reported during a focus group interview:

> I'm pretty close with them [the instructors]. … We have her number in case we can't make it or something, or get sick, so it's pretty close. It's not like total strangers.

Another student commented, "It's a lot more personal. We feel comfortable with the instructor." Other responses corroborated this sense of connection. According to one student, "The teachers can actually go around and help students. They look at what you've written down; they help you."

While students in many programs felt that they had an open and comfortable relationship with the faculty, other students mentioned that relationships with their teachers

were not as warm. One student pointed out that "half of them don't even know our names," while another student blamed the accelerated nature of the program for the more impersonal student–teacher relationships: "I think if the program was longer, like you get a closer bond with your teachers."

Student Learning

Focus group interview responses conveyed how instructors worked to help students make connections between what they were learning in their courses and ways of applying what they learned. In considering the ways that these connections made the learning process more enjoyable, one student explained:

> And then I go to my student development class. … I think that class I love the best because, like, I can relate to what he's saying and that's something that kind of like interests me [. . .] like today we talked about priorities and values.

When asked whether any of their learning exercises related to real-world situations, one student stated, "Yeah, in reading a lot. She's [instructor] getting us prepared for college … with the writing." Students generally reported more widespread relevant and active learning in the reading and writing courses. In many of these courses, students had the opportunity to select their own topics for journal writing, and reading materials spanned a variety of subject matters. Some math instructors also attempted to use relevant course material. In response to a question about whether real-world examples were used in math class, one student responded, "My teacher — he does because he uses money. Because he's like, he tells us, 'People think math is hard, but once they relate it to money, they get it.'"

Students across the sites also reported receiving more individualized attention from instructors in their developmental summer bridge program courses than in their high school experiences. One student commented, "It's more individual … and he helps you with what you don't know. So it's more like just for you." Another student remark accentuated how some teachers seemed to relate to developmental summer bridge students more: "Because the teacher like — he can relate to us a lot more than like other teachers that just go and just teach you about the skills or whatever."

Student Overall Program Success and Completion

Student focus group interview data and results from the student exit survey administered at each of the participating colleges indicate that many students perceived the developmental summer bridge programs and their experiences with them as successful. Of a total of 689 students who showed up for a developmental summer bridge program in the

first week of program implementation, 638 students (93 percent) persisted until the final week, completing the entire summer program (see Table 4.2). Additionally, when asked if they were planning on attending the college where they attended a developmental summer bridge, students in focus groups generally answered in the affirmative.

Students generally agreed that they felt academically prepared for college, and almost all students felt that the developmental summer bridge programs helped improve their study skills and allowed them to learn more about academic support services (tutoring, math and writing labs, etc.) and financial aid options. In addition, many students felt more confident about doing college-level work and attending college after participating in a developmental summer bridge program.

While student perceptions of the overall program experience were overwhelmingly positive, students also suggested there were avenues for further program improvement, in terms of both structure and delivery of services. For example, some students commented that they felt excessively "babied" at times. In one focus group interview, when asked how developmental summer bridge program classes compared with those in high school, students agreed that the amount of instruction and "hand holding" was similar to that the amount experienced in high school:

> Actually, it feels like I'm still in high school … because [the instructor] holds our hand. … And he explains everything in step, by step, by step, by step and I'm like, "Oh, my goodness. I already — we got it. We got it yesterday when you explained it to us." I got it in high school. I got it in junior high when I heard this. We got it.

Some students also suggested that they might have benefited more from had program models encouraged stronger cohort relationships. Although many classes did provide structured opportunities for students to interact with their peers, little informal interaction was encouraged outside of the classroom, resulting in some students lacking a peer support network.

Students generally indicated dislike for the programs' early-morning start times and the number of consecutive hours of mental focus that the developmental summer bridge programs demanded. They also expressed dissatisfaction with the amount of homework in classes, commenting on the time commitment demanded by the programs, even outside of time spent in the classroom or lab. However, many students also appreciated the accelerated program format and the opportunities provided by an intensive academic summer program.

Texas Developmental Summer Bridge Programs

Table 4.2

Program Enrollment and Completion

Institution	Students in Program Group	Ever Attended Program	Completed Program	Completion Rate (%)
El Paso Community College	165	139	138	99
Lone Star College–CyFair	75	65	64	98
Lone Star College–Kingwood	52	51	41	80
South Texas College	83	72	63	88
Texas A&M International University	126	113	111	98
Palo Alto College	53	52	35	67
San Antonio College	91	58	47	81
St. Philip's College	154	146	139	95
Total	**799**	**689**	**638**	**93**

Chapter 5

Program Impacts on Educational Outcomes

A key goal of the developmental summer bridge study is to test whether the developmental summer bridge programs — with their four main components — help students matriculate into college and perform better academically once enrolled. This chapter focuses on the impact of the developmental summer bridge programs on enrollment and academic progress for two semesters after students first enrolled in the study. This chapter describes the data sources used in the analysis of academic outcomes, provides an overview of these outcomes, and reviews findings on the programs' impacts on academic outcomes.

Key Impact Findings and Selected Outcomes

The study yielded two key findings:

- Program group students did not enroll in either the fall or spring semester at significantly different rates than control group students; enrollment rates were high for both groups.
- There is evidence that the program group students were more likely to pass college-level courses in math and writing in the fall semester following the summer programs and more likely to attempt higher level reading, writing, and math courses than their control group counterparts.

As described more fully in Box 5.1, the tables that follow present average outcomes for the students assigned to the program group and the control group, the difference between the two groups' averages (which represents the estimated impact of the program), and the standard error of the difference.

The indicators of student academic progress examined in this report reflect measures that are commonly viewed as important in the community college setting. The primary data source for each measure is the THECB. Data from the eight participating colleges are used to supplement the statewide THECB data unless otherwise noted. In order to reduce the likelihood of observing spurious relationships, we limited the number of primary (or confirmatory) outcomes examined (Schochet, 2008). The analyses of primary outcomes serve as the basis for determining the overall effectiveness of the developmental summer bridge programs, while the analyses of secondary outcomes are more exploratory in nature and serve to identify areas for future study.

Box 5.1

How to Read the Impact Tables in This Report

Most tables in this report use a similar format, illustrated below. The abbreviated table below displays transcript data and shows some educational outcomes for the program group and the control group. The first row, for example, shows that 15.1 percent of the program group members and 6.5 percent of the control group members enrolled in a first college-level math course.

Because individuals were assigned randomly either to the program group or to the control group, the effects of the program can be estimated by the difference in outcomes between the two groups. The "Difference" column in the table shows the differences between the two research groups' outcomes — that is, the program's estimated impacts on the outcomes. For example, the estimated impact on attempting the first college-level math course can be calculated by subtracting 6.5 percent from 15.1 percent, yielding an increase or estimated impact of 8.7 percentage points (rounded). Thus the term *impact* refers to the "added value" of the program, or the program's effects that go above and beyond the effects of the services provided to the control group. This difference represents the *estimated* impact rather than the *true* impact because, although study participants are randomly assigned to the program and control groups, there is still a possibility that differences could be observed by chance.

Differences marked with one or more asterisks are *statistically significant*, meaning that there is only a small probability that the observed difference occurred by chance. The number of asterisks indicates the probability of observing differences at least as extreme as the observed differences if the program's true impact is zero. One asterisk corresponds to a 10 percent probability; two asterisks, a 5 percent probability; and three asterisks, a 1 percent probability. For example, as the first row of the table excerpt shows, the program's estimated impact on students enrolling in the first college-level math course is 8.7 percentage points. The three asterisks indicate that this difference is statistically significant at the 1 percent level, meaning that there is less than a 1 percent chance of observing a difference this large if the program's true impact is zero. In other words, one can be 99 percent confident that the program had a positive impact on students attempting the first college-level math course.

The statistical significance is calculated using the standard error of the impact estimate, shown in the rightmost column. The standard error is a measure of uncertainty or variability around the impact estimate. Some useful rules of thumb are that there is about a 90 percent chance that the true impact is within plus or minus 1.65 standard errors of the estimated impact, roughly a 95 percent chance that the true impact is within plus or minus 1.96 standard errors of the estimated impact, and about a 99 percent chance that the true impact is within plus or minus 2.58 standard errors of the estimated impact. For example, in the first row of data below, there is roughly a 99 percent chance that the program's impact on students' likelihood of attempting the first college-level math course lies between 4.31 and 13.09 percentage points, calculated as $8.7 \pm (2.58 \times 1.7)$.

Outcome	Program Group (%)	Control Group (%)	Difference (Impact)	Standard Error
Attempted first college-level math course	15.1	6.5	8.7***	1.7
Passed first college-level math course	8.8	4.4	4.4***	1.4

Primary Indicators of Academic Progress

- *Fall 2009 enrollment:* One of the goals of the developmental summer bridge programs was to ease the transition into college for students. Thus, an important indicator of the success of the program is enrollment at any college in the fall 2009 term.

- *Progression in developmental and college-level courses in math, reading, and writing:* One of the goals of the developmental summer bridge programs was to accelerate students' progress through any required developmental course sequence and through the first college-level course in math, reading, or writing. An important indicator of this progress is the completion of entry-level college courses.

Secondary/Exploratory Indicators of Academic Progress

- *Spring 2010 enrollment:* This outcome measures the enrollment rate at any college in the spring 2010 semester.

- *Total credits attempted*: Since a student's progress toward earning a certificate or degree depends on fulfilling both developmental and college-level requirements, it is difficult to measure progress toward a degree directly. For this reason, the number of credits attempted will serve as a proxy for progress toward a degree. The primary measure of this progress will be the total number of credits attempted (developmental and college-level) in fall 2009, spring 2010, and cumulatively over the follow-up period, through the spring of 2011. Additionally, the number of developmental credits attempted and college-level credits attempted will be examined separately.

- *Developmental credits earned*: An examination of the number of developmental credits accumulated in the fall 2009 term can be used to gain a better understanding of whether students who attempt credits indeed pass the course and earn the credits. While it would be ideal to present information on both developmental and college-level credits earned, the latter are not currently available. We expect to have measures of college-level credits earned in the final report.

In addition, student progress measures are examined by subgroup to explore (1) whether the programs are equally effective for different types of students and (2) whether different types of summer bridge programs are equally effective. In the current report, exploratory

subgroup analyses are conducted to assess differential program effectiveness (1) for males and females and (2) for students in course-based and freestanding programs. The relative performance of student groups that differ by socioeconomic status will be analyzed in the final report.

Fall 2009 Semester Outcomes

Table 5.1 shows select academic outcomes from the fall 2009 semester — the first semester in which students were eligible to enroll in college after the summer bridge programs — and enrollment outcomes from the spring 2010 semester.[1]

The analyses described in this report are intent-to-treat (ITT) analyses, which examine the impact of being assigned to the program group rather than the impact of receiving the program.[2] In other words, the program group's results are for all 793 students who were assigned to the program group, including the 104 students who did not participate in a summer bridge program, in addition to the 689 students who did participate.

Enrollment

Surprisingly, programs did not have any impact on fall 2009 registration rates; students in the program group registered for courses in the fall 2009 semester at a rate (77.4 percent) that is statistically indistinguishable from the enrollment rate of the control group (76.4 percent). This finding contradicts the hypothesis that the summer bridge programs would boost enrollment rates among the program group students.

Progression in Math

While students in the program and control groups attempted at least one math course at similar rates, students who participated in the developmental summer bridge programs went on to attempt the first college-level math course at a significantly[3] higher rate (15.1 percent) than students in the control group (6.5 percent). A significantly higher percentage of program group students also passed this first college-level math course (8.8 percent, compared with 4.4 percent for the control group), though this difference is due to the larger percentage of program group students who enrolled in an entry-level college math course.

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[1]See Appendix A for a detailed description of the analytic model used to estimate impacts.

[2]For a detailed description of the difference between these two types of analyses and their interpretations, see Bloom (2005).

[3]Throughout this report, the terms "significant" and "significantly" always refer to statistical significance. See Box 5.1.

Texas Developmental Summer Bridge Programs

Table 5.1

Select Academic Outcome Measures

Outcome	Program Group	Control Group	Difference (Impact)	*p*-value	Std. Error
N	793	525			
Fall 2009					
Registered for at least one course	77.4%	76.4%	1.0	.68	2.4
Math progression					
Attempts					
First college-level course	15.1%	6.5%	8.7***	.00	1.7
1 level below college-level	14.6%	16.9%	-2.3	.24	2.0
2 levels below college-level	9.9%	11.5%	-1.6	.35	1.7
3 levels below college-level	8.0%	10.5%	-2.5	.12	1.6
Did not attempt any level	52.3%	54.6%	-2.3	.38	2.7
Passes					
First college-level course	8.8%	4.4%	4.4***	.00	1.4
1 level below college-level	10.5%	12.2%	-1.7	.32	1.7
2 levels below college-level	7.3%	8.2%	-1.0	.52	1.5
3 levels below college-level	6.9%	8.0%	-1.1	.45	1.4
Did not pass any attempts	14.3%	12.6%	1.7	.36	1.9
Reading progression					
Attempts					
First college-level course	42.0%	36.2%	5.7**	.02	2.5
1 level below college-level	10.0%	9.4%	0.6	.72	1.7
2 levels below college-level	4.2%	4.8%	-0.6	.60	1.2
3 levels below college-level	1.9%	4.4%	-2.5***	.01	0.9
Did not attempt any level	42.0%	45.3%	-3.2	.22	2.6
Passes					
First college-level course	30.6%	27.1%	3.5	.15	2.4
1 level below college-level	7.9%	7.8%	0.1	.95	1.5
2 levels below college-level	3.7%	4.6%	-0.9	.40	1.1
3 levels below college-level	1.4%	3.8%	-2.4***	.00	0.8
Did not pass any attempts	14.4%	11.4%	3.0	.11	1.9

Table 5.1 (continued)

Outcome	Program Group	Control Group	Difference (Impact)	*p*-value	Std. Error
Writing progression					
Attempts					
First college-level course	39.7%	35.8%	3.9	.13	2.6
1 level below college-level	12.5%	8.8%	3.7**	.03	1.7
2 levels below college-level	2.1%	1.2%	1.0	.18	0.7
3 levels below college-level	1.4%	2.1%	-0.7	.32	0.7
Did not attempt any level	44.3%	52.1%	-7.8***	.00	2.6
Passes					
First college-level course	32.0%	26.9%	5.1**	.04	2.5
1 level below college-level	8.7%	7.2%	1.5	.33	1.5
2 levels below college-level	1.9%	0.8%	1.1*	.09	0.7
3 levels below college-level	1.1%	2.1%	-1.0	.16	0.7
Did not pass any attempts	12.0%	10.9%	1.1	.54	1.8
Credits attempted	9.2	8.8	0.3	.29	0.3
College credits	6.2	5.9	0.3	.27	0.3
Developmental credits	3.0	3.0	0.0	.89	0.2
Developmental credits earned	1.8	1.9	-0.1	.66	0.1
Spring 2010					
Registered for any courses	74.5%	75.3%	-0.8	.75	2.4
Credits attempted	9.3	9.1	0.3	.49	0.4
College credits	7.7	7.1	0.6*	.09	0.3
Developmental credits	1.6	2.0	-0.3**	.03	0.1
Cumulative Measures[a]					
Credits attempted	19.9	18.7	1.1*	.07	0.6
College credits	14.3	13.3	1.0*	.07	0.6
Developmental credits	5.5	5.4	0.1	.69	0.3

SOURCE: NCPR calculations using Texas Higher Education Coordinating Board data and college transcript data.

NOTES: Rounding may cause slight discrepancies in sums and differences. Estimates are adjusted by site. A two-tailed *t*-test was applied to differences between research groups.

***$p < .01$. **$p < .05$. *$p < .10$.

[a]Includes credits attempted in summer 2009.

Progression in Reading

There is no statistically significant difference in the rate at which students in the program and control groups attempted at least one reading course. However, program group students were significantly more likely to attempt a college-level reading course (the rate was 42.0 percent, compared with 36.2 percent for the control group) and significantly less likely to attempt the lowest level course in developmental reading (the rate was 1.9 percent, compared with 4.4 percent for the control group). It is worth noting, however, that the difference in pass rates for the first college-level reading course among program group students (30.6 percent) and control group students (27.1 percent) is not statistically significant.

Progression in Writing

Significantly more program group students than control group students attempted at least one writing course (the rates were 55.7 percent and 47.9 percent, respectively). Program group students were also more likely to attempt the highest level of developmental writing compared with the students in the control group (the rates were 12.5 percent and 8.8 percent, respectively). Students in the program group were significantly more likely to pass both their first college-level writing course (the rate was 32.0 percent, compared with 26.9 percent for the control group) and a developmental writing course two levels below the college level (the rate was 1.9 percent, compared with 0.8 percent for the control group; the 1.1 percentage point difference here is statistically significant at the 10 percent level).

Total Credits Attempted

There is no statistically significant difference between the two groups in the total number of credits attempted in fall 2009 or in the composition of their respective credit loads in fall 2009. Students in the program group registered for about the same number of college-level credits (about 6 credits) and developmental credits (about 3 credits) as students in the control group.

Developmental Credits Earned

There is no statistically significant difference between the two groups in the total number of developmental credits earned. Students in the program group earned, on average, 1.8 developmental credits; students in the control group earned 1.9 developmental credits.

Spring 2010 Semester Outcomes and Cumulative Measures

Enrollment

Students in the program and control groups registered at similar rates in the spring 2010 semester (the second full academic term following the developmental summer bridge programs). Surprisingly, registration rates for the spring 2010 semester (about 75 percent for both groups) were similar to those for the fall 2009 semester. Attrition is common between the fall and spring semesters; the lack of attrition seen here is attributable to the fact that some students who did not register for the fall 2009 term registered for the spring 2010 term, while other students who did register in fall 2009 did not return in the spring.

Total Credits Attempted

There is a statistically significant difference in the number of college-level and developmental credits attempted in the spring semester by students in the program group compared with students in the control group. Students in the program group registered for more college-level credits (7.7 credits, compared with 7.1 credits for the control group; this 0.6 credit impact is statistically significant at the 10 percent level) and fewer developmental credits (1.6 credits, compared with 2.0 credits for the control group) than control group students. This may reflect the program's effectiveness in getting students to attempt higher level courses in math, reading, or writing sequences.

Cumulative Measures

As of the spring 2010 semester, students in the program group had attempted, on average, one more college-level credit than did students in the control group (program group students attempted 14.3 credits, compared with 13.3 credits for the control group; the 1.0 credit impact is statistically significant at the 10 percent level). Follow-up analyses will compare the two groups in terms of college-level and developmental credits attempted and earned in the two years following the summer bridge program.

Subgroup Analyses

This section presents impacts on educational outcomes by subgroup (seen also in Tables 5.2 and 5.3). These analyses assess whether there were impacts for the selected subgroups of students (e.g., females) and whether there were differential impacts between subgroups of students (e.g., between females and males). Subgroup analyses were conducted to ascertain differences in the program's effect on males and females because differences have been detected in other developmental education interventions (Scrivener et

al., 2008). A subgroup analysis was also performed to compare the impacts of freestanding and course-based programs.

Academic Outcomes by Gender

There are almost no statistically significant differences in impacts between men and women on the primary outcome measures of the effectiveness of the developmental summer bridge programs (the sole exception is in passing the lowest level of developmental reading), and there are no statistically significant differences in impacts for secondary measures of the programs' effectiveness. In other words, there is virtually no evidence that the programs were more or less effective for either gender.

Academic Outcomes by Program Type

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There is some evidence that course-based and freestanding developmental summer bridge programs had different impacts on program and control group students. For example, the two types of programs had significantly different impacts on the number of developmental credits students attempted in the fall 2009 semester, with a positive impact (of 0.6 credits) for students attending the course-based programs and no statistically significant impact (the statistically non-significant estimate is -0.3 credits) for those attending the freestanding programs. There are also statistically significant differences between the impacts of course-based and freestanding programs on the number of credits students attempted in the spring 2010 term and on the types of courses they registered for. For example, whereas students in the course-based programs attempted, on average, 1.8 more college-level credits than students in the control group, there is no statistically significant difference in the number of college-level credits attempted by students in the freestanding programs compared with students in the control group. The results suggest that the course-based programs may have been more effective in getting students to attempt more college-level courses. While it is not surprising that participation in a course-based program results in a higher number of credits attempted, program group students in the course-based programs continued to register for more credits than their control group counterparts in the post-program semesters.

Texas Developmental Summer Bridge Programs

Table 5.2

Academic Outcomes by Gender

Outcome (with significant differences between subgroups denoted by daggers)	Male					Female				
	Program Group	Control Group	Diff. (Impact)	*p*-value	Std. Error	Program Group	Control Group	Diff. (Impact)	*p*-value	Std. Error
N	293	196				489	321			
Fall 2009										
Registered for at least one course	79.1%	79.7%	-0.5	.88	3.7	76.3%	74.2%	2.1	.49	3.1
Math progression										
Attempts										
First college-level course	15.8%	8.0%	7.9***	.01	2.9	14.4%	5.4%	9.0***	.00	2.1
1 level below college-level	15.5%	18.7%	-3.3	.32	3.3	14.1%	15.9%	-1.8	.47	2.4
2 levels below college-level	8.5%	8.3%	0.2	.93	2.5	10.7%	13.6%	-2.8	.22	2.3
3 levels below college-level	8.6%	9.0%	-0.4	.88	2.6	7.7%	11.6%	-3.9*	.06	2.1
Did not attempt any level	51.6%	56.0%	-4.4	.32	4.4	53.0%	53.5%	-0.5	.88	3.4
Passes										
First college-level course	9.1%	4.7%	4.4*	.06	2.4	8.9%	3.9%	5.0***	.01	1.8
1 level below college-level	9.9%	14.8%	-4.9*	.10	2.9	10.5%	11.1%	-0.6	.79	2.1
2 levels below college-level	5.5%	5.1%	0.4	.83	2.1	8.3%	10.2%	-1.9	.35	2.0
3 levels below college-level	7.3%	6.0%	1.3	.57	2.3	6.7%	9.4%	-2.7	.15	1.9
Did not pass any attempts	16.6%	13.5%	3.1	.33	3.2	12.7%	11.9%	0.8	.73	2.3

Table 5.2 (continued)

Outcome (with significant differences between subgroups denoted by daggers)	Male					Female				
	Program Group	Control Group	Diff. (Impact)	*p*-value	Std. Error	Program Group	Control Group	Diff. (Impact)	*p*-value	Std. Error
Reading progression										
Attempts										
First college-level course	42.0%	36.7%	5.4	.18	4.0	41.6%	36.0%	5.6*	.09	3.3
1 level below college-level	9.8%	6.2%	3.6	.16	2.6	10.3%	11.1%	-0.9	.69	2.2
2 levels below college-level	3.4%	5.6%	-2.2	.24	1.9	4.7%	4.4%	0.3	.85	1.5
3 levels below college-level	1.4%	2.1%	-0.7	.56	1.2	2.0%	5.9%	-3.9***	.00	1.3
Did not attempt any level	43.4%	49.5%	-6.1	.14	4.1	41.4%	42.5%	-1.1	.75	3.4
Passes										
First college-level course	29.2%	27.2%	2.0	.61	3.8	31.5%	27.4%	4.1	.18	3.1
1 level below college-level	6.5%	5.6%	0.8	.71	2.2	9.0%	9.0%	0.0	.99	2.1
2 levels below college-level	3.1%	5.1%	-2.0	.25	1.8	4.1%	4.4%	-0.4	.80	1.4
3 levels below college-level ††	1.4%	1.5%	-0.1	.91	1.1	1.2%	5.3%	-4.1***	.00	1.2
Did not pass any attempts	16.5%	11.0%	5.5*	.08	3.1	12.8%	11.4%	1.4	.55	2.3
Writing progression										
Attempts										
First college-level course	38.5%	36.9%	1.6	.71	4.2	40.3%	35.1%	5.2	.12	3.3
1 level below college-level	14.0%	8.6%	5.4*	.07	2.9	11.2%	9.1%	2.0	.35	2.2
2 levels below college-level	3.1%	0.5%	2.6*	.05	1.3	1.7%	1.5%	0.1	.87	0.9
3 levels below college-level	1.0%	2.0%	-1.0	.36	1.1	1.6%	1.9%	-0.3	.78	0.9
Did not attempt any level	43.4%	51.9%	-8.5**	.04	4.2	45.2%	52.3%	-7.1**	.03	3.3
Passes										
First college-level course	30.4%	27.0%	3.4	.40	4.0	33.4%	27.1%	6.3**	.05	3.2
1 level below college-level	8.3%	5.5%	2.8	.25	2.4	8.5%	8.5%	0.0	.99	2.0
2 levels below college-level	2.4%	0.5%	1.9	.11	1.2	1.7%	0.9%	0.7	.37	0.8

Table 5.2 (continued)

Outcome (with significant differences between subgroups denoted by daggers)	Male					Female				
	Program Group	Control Group	Diff. (Impact)	*p*-value	Std. Error	Program Group	Control Group	Diff. (Impact)	*p*-value	Std. Error
3 levels below college-level	1.0%	2.0%	-1.0	.36	1.1	1.2%	1.9%	-0.7	.43	0.9
Did not pass any attempts	14.5%	13.0%	1.5	.63	3.1	10.0%	9.3%	0.7	.74	2.1
Credits attempted	9.3	9.3	0.1	.87	0.5	9.1	8.5	0.5	.19	0.4
College credits	6.4	6.4	0.0	.95	0.4	6.0	5.5	0.5	.14	0.3
Developmental credits	2.9	2.9	0.0	.87	0.3	3.1	3.1	0.0	.96	0.2
Developmental credits earned	1.6	1.6	0.0	.98	0.2	1.9	2.1	-0.1	.45	0.2
Spring 2010										
Registered for at least one course	77.3%	79.3%	-2.0	.59	3.8	73.0%	72.6%	0.4	.90	3.2
Credits attempted	9.4	9.6	-0.2	.72	0.6	9.4	8.8	0.6	.21	0.5
College credits	7.9	7.7	0.2	.70	0.5	7.6	6.8	0.8*	.05	0.4
Developmental credits	1.5	1.9	-0.4	.10	0.2	1.7	2.0	-0.3	.18	0.2
Cumulative Measures[a]										
Credits attempted	20.1	19.4	0.6	.52	1.0	19.8	18.2	1.6*	.05	0.8
College credits	14.8	14.3	0.4	.63	0.9	14.1	12.6	1.5**	.04	0.7
Developmental credits	5.3	5.1	0.2	.71	0.5	5.7	5.6	0.1	.74	0.4

SOURCE: NCPR calculations from Texas Higher Education Coordinating Board and college transcript data.

NOTES: Rounding may cause slight discrepancies in sums and differences. Estimates are adjusted by site. A two-tailed *t*-test was applied to differences between research groups and differences of impacts between subgroups.

***$p < .01$. **$p < .05$. *$p < .10$.

Significant differences between subgroups denoted as follows: $^{\dagger\dagger\dagger}p < .01$; $^{\dagger\dagger}p < .05$; $^{\dagger}p < .10$.

[a]Includes credits attempted in summer 2009.

Texas Developmental Summer Bridge Programs

Table 5.3

Academic Outcomes by Program Type

Outcome (with significant differences between subgroups denoted by daggers)	Freestanding Programs					Course-Based Programs				
	Program Group	Control Group	Diff. (Impact)	*p*-value	Std. Error	Program Group	Control Group	Diff. (Impact)	*p*-value	Std. Error
N	527	349				266	176			
Fall 2009										
Registered for at least one course	76.8%	75.7%	1.1	.70	2.9	78.6%	77.9%	0.7	.86	4.0
Math progression										
Attempts										
First college-level course	16.0%	5.4%	10.5***	.00	2.1	13.5%	8.5%	5.0*	.10	3.0
1 level below college-level	13.1%	16.6%	-3.5	.13	2.4	17.7%	17.5%	0.2	.96	3.5
2 levels below college-level	10.7%	13.3%	-2.5	.24	2.2	8.3%	8.0%	0.3	.90	2.6
3 levels below college-level	7.2%	10.1%	-2.9	.13	1.9	9.8%	11.4%	-1.6	.58	2.9
Did not attempt any level	53.0%	54.6%	-1.6	.64	3.3	50.7%	54.6%	-3.8	.39	4.5
Passes										
First college-level course	9.3%	4.0%	5.3***	.00	1.7	7.9%	5.1%	2.7	.26	2.4
1 level below college-level	10.0%	12.1%	-2.0	.33	2.1	11.3%	12.4%	-1.1	.71	3.0
2 levels below college-level	7.0%	8.7%	-1.7	.35	1.8	7.9%	7.4%	0.5	.84	2.5
3 levels below college-level	6.4%	8.3%	-1.9	.28	1.8	7.9%	7.4%	0.5	.85	2.6
Did not pass any attempts	14.2%	12.3%	1.9	.40	2.3	14.3%	13.1%	1.2	.71	3.3

Table 5.3 (continued)

Outcome (with significant differences between subgroups denoted by daggers)	Freestanding Programs					Course-Based Programs				
	Program Group	Control Group	Diff. (Impact)	*p*-value	Std. Error	Program Group	Control Group	Diff. (Impact)	*p*-value	Std. Error
Reading progression										
Attempts										
First college-level course	41.3%	34.7%	6.6**	.03	3.0	43.2%	39.2%	4.0	.38	4.6
1 level below college-level	8.2%	8.6%	-0.4	.82	1.9	13.5%	10.8%	2.7	.40	3.2
2 levels below college-level †††	5.3%	3.7%	1.6	.28	1.4	1.9%	6.8%	-4.9***	.01	1.9
3 levels below college-level ††	1.9%	5.7%	-3.8***	.00	1.2	1.9%	1.7%	0.2	.90	1.3
Did not attempt any level	43.3%	47.2%	-3.9	.23	3.2	39.5%	41.4%	-1.9	.66	4.5
Passes										
First college-level course	30.5%	26.2%	4.3	.14	2.9	30.8%	29.0%	1.9	.66	4.3
1 level below college-level †	6.3%	8.0%	-1.8	.31	1.8	11.3%	7.4%	3.8	.18	2.9
2 levels below college-level †††	4.5%	3.4%	1.1	.42	1.4	1.9%	6.8%	-4.9***	.01	1.9
3 levels below college-level ††	1.3%	4.9%	-3.6***	.00	1.1	1.5%	1.7%	-0.2	.87	1.2
Did not pass any attempts	14.1%	10.2%	3.8*	.09	2.2	15.0%	13.7%	1.4	.69	3.4
Writing progression										
Attempts										
First college-level course	39.1%	34.4	4.7	.13	3.1	40.9%	38.7%	2.2	.63	4.6
1 level below college-level	9.5%	7.5	2.0	.30	1.9	18.4%	11.3%	7.1**	.04	3.5
2 levels below college-level	2.1%	0.6	1.5*	.07	0.8	2.2%	2.3%	0.0	.98	1.4
3 levels below college-level	2.1%	2.6	-0.5	.63	1.0	0.0%	1.1%	-1.1*	.08	0.7
Did not attempt any level	47.3%	55.0	-7.7**	.02	3.2	38.4%	46.5%	-8.2*	.07	4.4
Passes										
First college-level course	31.7%	25.8	5.9**	.05	2.9	32.7%	29.0%	3.7	.41	4.5
1 level below college-level	6.1%	5.7	0.4	.82	1.6	13.9%	10.2%	3.7	.25	3.2
2 levels below college-level	1.7%	0.3	1.4*	.05	0.7	2.2%	1.7%	0.5	.69	1.4
3 levels below college-level	1.7%	2.6	-0.9	.37	1.0	0.0%	1.1%	-1.1*	.08	0.7
Did not pass any attempts	11.6%	10.6	0.9	.66	2.1	12.8%	11.4%	1.4	.66	3.1

Table 5.3 (continued)

Outcome (with significant differences between subgroups denoted by daggers)	Freestanding Programs					Course-Based Programs				
	Program Group	Control Group	Diff. (Impact)	*p*-value	Std. Error	Program Group	Control Group	Diff. (Impact)	*p*-value	Std. Error
Credits attempted	8.9	8.8	0.1	.87	0.4	9.7	8.9	0.8	.11	0.5
College credits	6.2	5.8	0.4	.29	0.3	6.1	5.9	0.2	.68	0.5
Developmental credits ††	2.7	3.0	-0.3	.20	0.2	3.6	3.0	0.6**	.03	0.3
Developmental credits earned ††	1.6	1.8	-0.3	.11	0.2	2.4	2.0	0.3	.18	0.3
Spring 2010										
Registered for at least one course	73.4	74.8	-1.4	.64	3.0	76.7%	76.2%	0.5%	.90	4.1
Credits attempted †††	8.5	9.1	-0.6	.18	0.4	11.0	9.1	1.8***	.01	0.7
College credits ††	7.1	7.1	0.0	.92	0.4	9.0	7.2	1.8***	.01	0.7
Developmental credits †	1.5	2.0	-0.5***	.00	0.2	2.0	2.0	0.0	.86	0.3
Cumulative Measures[a]										
Credits attempted †††	17.9	18.4	-0.5	.50	0.7	23.7	19.4	4.3***	.00	1.1
College credits	13.7	13.2	0.5	.48	0.7	15.6	13.5	2.1**	.05	1.0
Developmental credits †††	4.2	5.2	-1.0***	.00	0.3	8.1	5.9	2.2***	.00	0.5

SOURCE: NCPR calculations using Texas Higher Education Coordinating Board and college transcript data.

NOTES: Rounding may cause slight discrepancies in sums and differences. Estimates are adjusted by site. A two-tailed *t*-test was applied to differences between research groups and differences of impacts between subgroups.

***$p < .01$. **$p < .05$. *$p < .10$.

Significant differences between subgroups denoted as follows: $^{\dagger\dagger\dagger}p < .01$; $^{\dagger\dagger}p < .05$; $^{\dagger}p < .10$.

[a]Includes credits attempted in summer 2009.

Chapter 6

Conclusion: A Positive Early Look

Our conclusion from this early look is that the Texas developmental summer bridge programs we investigated did help students attempt and pass more college-level courses in math and writing. Specifically, by the end of spring 2010, students in the program group attempted one college-level credit more than students in the control group (statistically significant at the 10 percent level). This modest effect is encouraging, as students' course-taking patterns appear to be trending in the desired direction — toward the accumulation of more college-level credits. It is important to note that these early findings reflect student academic progress for only one year and that longer follow-up will provide additional evidence.

It is also worth noting that programs had no effect on enrollment rates for the fall or the spring, suggesting that they were not useful in enhancing access to college. Interpreted differently, the relatively high enrollment rates for both program group and control group students might reflect the behaviors of a highly motivated student population, already on track to go to college. In fact, students stated on the intake form (and program students reiterated in their focus groups) a desire to attend and succeed in college. Based on the evidence from this study, it is not possible to determine whether students who were less likely to attend college would have benefited from the programs.

The Developmental Summer Bridge Model

The research in this report suggests that, although the delivery of the summer bridge program varied somewhat across colleges, each of the eight colleges implemented a fair test of the program model. Because each of the four components of the program model are integral to the intervention, teasing apart which programmatic elements were most successful in promoting positive student outcomes is not feasible in the current research. However, there is modest support for the notion that course-based programs are slightly better than freestanding programs at helping students attempt college-level courses. This may reflect the fact that more students in the course-based programs entered college at higher levels of the developmental course sequence. With the exception of Palo Alto, course-based programs primarily targeted students at the highest developmental levels, while freestanding programs invited a broader range of developmental students to participate. Another interpretation of these findings is that because the course-based programs actually award developmental credit, students in these programs may be

advantaged in the number of credits attempted. Nonetheless, these findings are preliminary, and we will revisit these program impacts with longer follow-up in the final report.

Implications for Policy and Practice

Early findings imply that developmental summer bridge programs help students pass entry-level college courses in math and writing. But why are there not similar effects on students' achievements in reading courses? It is possible that math and writing skills may be easier to remediate in college. If these results persist in the final year of the study, they may suggest that colleges should focus on building students' skills in math and writing — the two subjects areas where remediation is often needed the most. These early results also suggest that Texas should consider continued funding for these programs — perhaps with incentive funding to encourage greater student participation and program completion. The question remains as to whether a stipend is necessary to recruit eligible students, since some students avail themselves of the programs without monetary incentives.

Final Follow-Up Report

A final report with two years of longitudinal follow-up will be released within the next year. We expect to learn more about students' progression through developmental education, their success in college-level courses, and their persistence into and through the second year of college.

Appendix A

Estimating Effects

This appendix provides a detailed discussion of the statistical model used to estimate the program impacts on students' postsecondary academic performance and other related statistical issues.

Analysis of Program Impacts

The program impact analysis involves examining outcome measures constructed from the college transcript data and data from the Texas Higher Education Coordinating Board (THECB), with key outcomes listed in Chapter 5. Note that all the listed outcomes are measured at the level of the individual student. The analyses use ordinary least squares (OLS) regression to estimate the average difference in outcomes between program and control group students. Group means are presented using SAS's LSMEANS. The impact model includes college fixed effects; this means that the findings represent the estimated impact of the developmental summer bridge program in the set of colleges in which these interventions were implemented. In other words, the impact estimates are not generalizable to other colleges.

The Model

The impact analyses are pooled across colleges, with site-level dummies. For each outcome, the basic model used in the analysis is the following:

$$Y_i = \beta_0 T_i + \sum_K \lambda_k C_{ki} + \varepsilon_i \qquad (1)$$

Where:

Y_i = Outcome of interest for student *i*

T_i = Indicator of treatment group membership (treatment status). This indicator is equal to 1 if student *i* was assigned to the summer bridge program and zero otherwise

C_{ki} = A dummy equal to 1 if student *i* is at campus *k* and zero otherwise

ε_i = A within-student error term

Therefore:

β_0 = The estimated impact of the program on outcome *Y*

There are several features to note about this model:

- **Interpretation of the impact estimate.** β_0 is a fixed-effect impact estimate used in order to consider the average impact of the developmental summer bridge program for students in the analysis sample. This approach was taken because this study most closely reflects an efficacy study of the effects of a summer bridge program under relatively controlled conditions.[1]

- **College indicators.** Indicators for each college (C_k) are included in the model to capture a central feature of the research design, in which random assignment was conducted separately for each college. These indicators also account for variation in mean outcome levels across colleges. Thus, after including the college indicators in the model, the only source of variation in Y in this model is between students within colleges.

Note that the model does not control for pre-random assignment achievement, as no such measure was available.

Other Analytical Issues

Handling Missing Outcome Data

It is important to note that most outcomes of interest are influenced by enrollment rates. For example, only students who enroll have the opportunity to earn college credits, complete developmental course sequences, and utilize student services. Students who did not enroll are assigned a value of zero for all outcomes in all follow-up periods. Thus, low program group enrollment rates may reduce the likelihood of finding statistically significant impacts on other outcomes.

Cases in which no enrollment data for a student is found are imputed a value of zero; that is, they are treated as though the student did not register. It is possible that a student who does not appear in the data enrolled at a college outside of Texas (and is thus absent from the THECB data). It is also possible that a student who is not found opted out of reporting at his or her college. However, in these analyses, absence of evidence is treated as evidence of absence, and we initially assumed the student did not enroll. A phone survey of students whose data were not available from the colleges or the THECB was conducted

[1]Programs selected for the study were required to have four features: four to six weeks of accelerated instruction in developmental coursework; a college knowledge component; a stipend of up to $400; and additional student supports. Program features at other colleges may vary significantly, and the impact estimates described in this report are not statistically generalizable to a larger population of colleges or students.

to either confirm this assumption or fill in missing data about students' college enrollment status.

In cases where course information (such as the number of credits conferred) is missing from the files provided by colleges, we consulted college course catalogs to determine the appropriate values. Observations that are missing information on course completion (such as grades) were checked with the colleges. In cases where no grade could be determined, a grade of "incomplete" is assigned.

Approaching Multiple Hypothesis Testing

When making judgments about the statistical significance of the estimated impacts, it is important to recognize the potential problems associated with conducting multiple hypothesis tests. Conducting hypothesis tests for estimated impacts on several different outcomes and for many subgroups of students or schools increases the likelihood of concluding that some impact estimates are statistically significant when in fact they are not (generating a Type I error, or false positive).

We use two sets of safeguards to attenuate the risk of drawing inappropriate conclusions based on false positives. First, we use a parsimonious set of outcome measures. Second, we identify *a priori* a set of primary outcomes and subgroups. The primary outcome measures and subgroups are presented in Chapter 5.

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