

The Logic Underlying a Research-Based College Access Program: Depicting the Theory of Change of the Princeton University Preparatory Program



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RESEARCH REPORT

The Logic Underlying a Research-Based College Access Program: Depicting the Theory of Change of the Princeton University Preparatory Program

Catherine M. Millett, Stephanie R. Saunders, & Marisol J. C. Kevelson

Educational Testing Service, Princeton, NJ

The Princeton University Preparatory Program (PUPP) is a high-touch, intensive college access program aimed at providing a multiyear college preparation experience to high-achieving, low-income students in the Princeton, New Jersey, area. This report presents the theory of change and logic model of PUPP, detailing the theoretical basis for the expectation that PUPP inputs, resources, and activities will lead to the expected program outcomes, which include that program participants gain admittance to and graduate from selective colleges and universities providing comprehensive financial aid in the form of grants and scholarships.

Keywords College access programs; minority students; access to education; high school graduates; program effectiveness; program implementation; college preparation; low-income students; cost of college; financial aid; logic model; theory of change; college students; college bound; selective colleges

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Established in 2001, the Princeton University Preparatory Program (PUPP) provides rigorous academic and cultural enrichment programming to help high-achieving and low-income local public high school students prepare for admission to and ongoing success within selective colleges and universities. PUPP aims to develop and support cohorts of high-achieving, low-income Princeton-area students who attend and graduate from selective colleges.

One of the major reasons behind the development of PUPP is that high-achieving, low-income students are underrepresented at selective colleges and universities (Hillman, 2012). Colleges and universities are identified as selective based on their rankings on lists such as the Barron's Education Series' (2016) *Profiles of American Colleges*, which lists colleges and universities by their degree of admissions competitiveness. Ninety-three colleges and universities, including the eight Ivy League colleges and universities, are listed as most competitive; 103 are listed as highly competitive + or highly competitive; and 313 are listed as very competitive + or very competitive. PUPP strives for its students to enroll in and graduate from the two most selective groups.

In 2015, Princeton University contracted Educational Testing Service (ETS) to conduct an evaluation of PUPP. The purpose of the evaluation is to identify the program's strengths and potential areas for growth. One key component of the evaluation is the development of a logic model to depict the elements of PUPP and provide the theoretical basis for their existence and interconnectedness. The logic model presents the PUPP theory of action by outlining program inputs, key activities, outputs, and intended impact. The model depicts what the program provides and expects to accomplish, clarifies the program rationale, and explains why specific components of the interventions are expected to lead to the desired outcomes.

The logic model can serve PUPP by helping (a) to support program and strategic planning, (b) to communicate goals and progress, and (c) to serve as a basis for ongoing learning to make the work of programs stronger and more effective (Innovation Network Inc., 2010; Shakman & Rodriguez, 2015).

PUPP's theory of action has evolved and developed over time through the practical trials of more than a decade of implementation. This report provides a review of the literature that demonstrates a research basis for the program inputs, activities, and outcomes as they existed in 2016. This report provides the first formal logic model and current theory of action for PUPP.

Corresponding author: C. M. Millett, E-mail: cmillett@ets.org

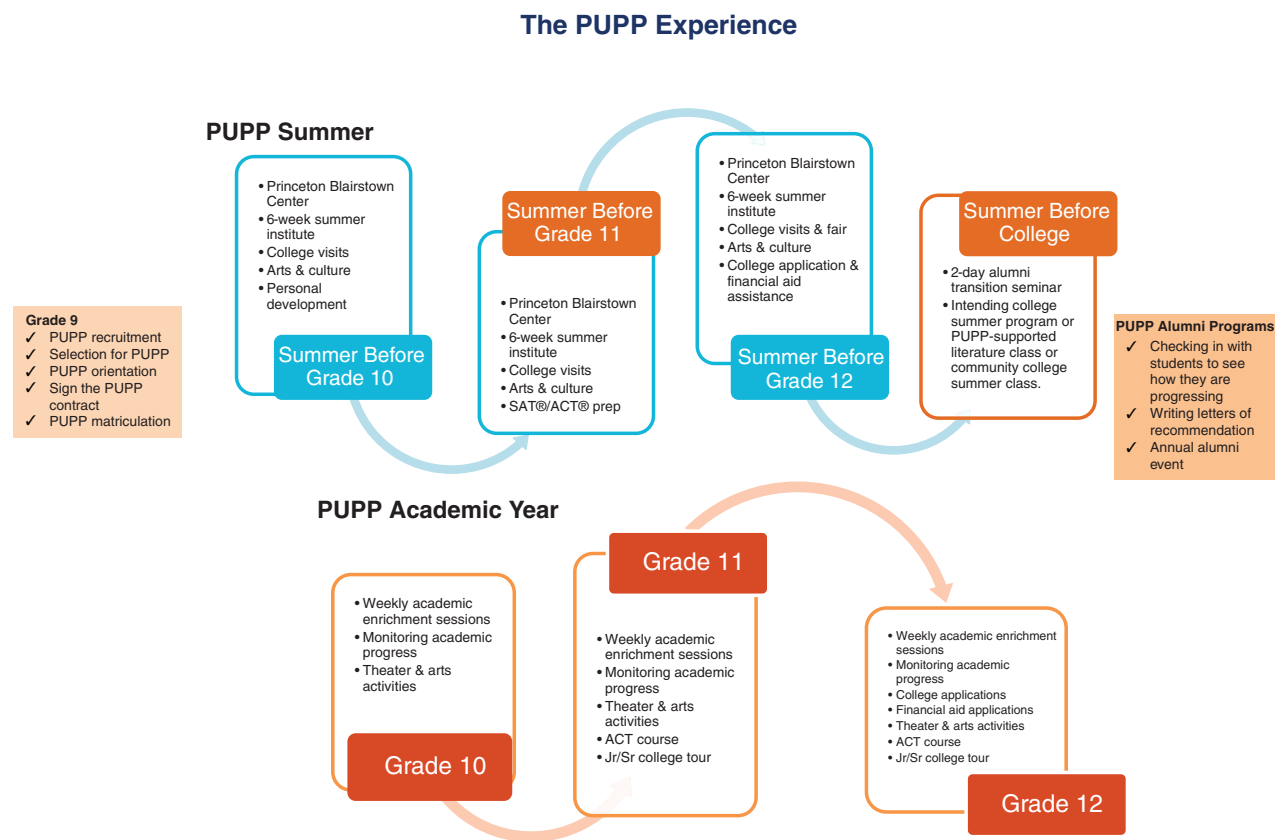


Figure 1 Princeton University Preparatory Program scholar summer and academic-year experience.

Princeton University Preparatory Program Overview

PUPP is a high-touch and time-intensive program aimed at providing a multiyear college preparation experience to high-achieving, low-income students in the Princeton, New Jersey, area (see Figure 1). The PUPP staff and faculty refer to these students as “PUPP scholars” to connote the program’s emphasis on developing scholarly attributes in each participant. PUPP activities are implemented with PUPP scholars during summers and academic years between the end of Grade 9 and entry into college. PUPP activities aim to provide academic enrichment; social and emotional skill development; college exposure; academic, college, and career counseling; arts and cultural enrichment; and student and family support, with the expectation that these activities will prepare traditionally underrepresented students for admission to and success at selective colleges and universities.

PUPP’s interventions go beyond the summer and academic-year activities with PUPP scholars and include (a) work with families in the form of activities to promote parent engagement and college knowledge and (b) supportive work with alumni PUPP scholars.

Program Assumptions

We think of it as a “high touch” model deliberately designed to engage in our scholars’ lives to buttress their goals and ambitions for future educational and professional success. (Klugman, 2014, p. 26)

Two primary and related program assumptions help organize PUPP. The first is that high-touch programs like PUPP provide students with supportive staff relationships that build on their college-going aspirations and skills. By definition, high-touch programs provide time and many opportunities for students and staff to work with each other over extended periods, which leads us to the next assumption: PUPP is a comprehensive and intensive 3-year college preparation program that demands a strong time commitment on behalf of its PUPP scholars.

Precollege programs that have the greatest impact tend to offer intensive, comprehensive services and require long-term commitment (Brotton, 2009). With PUPP, that long-term commitment and the intensive nature of the program are presented at the very beginning of the program at the orientation.

The PUPP orientation, conducted over two evenings at the end of PUPP scholars' freshman year of high school, gives all entering PUPP scholars and their parents opportunities to learn more about the program and ensures they know about program expectations and the PUPP code of conduct. During this event, students and their parents formally commit to be engaged in the comprehensive PUPP activities and services for the remainder of high school. They receive the *PUPP Scholar Handbook*. PUPP scholars and their parents sign a contract that outlines the 3-year intensive time commitment PUPP requires. Contracts for program participation are a common practice, one that is supported by the U.S. Department of Health and Human Services to promote youth engagement in programs (Office of Adolescent Health, n.d.).

How the Princeton University Preparatory Program Aligns With Effective College Access Program Strategies

Overall, PUPP practices align with established college access program strategies. PUPP strives to implement several key program activities that have been shown to be part of effective precollege programs. These activities include (a) preparing students for academically rigorous colleges through the implementation of a college preparatory curriculum, including challenging courses; (b) providing ongoing social support through peer relationships and mentoring from PUPP staff and leaders; (c) encouraging parent/family/guardian involvement; (d) helping students navigate the college admissions and financial aid application process; and (e) providing comprehensive, long-term support to overcome any potential obstacles to college or career success (Brotton, 2009). Furthermore, PUPP follows several established principles of practice for precollegiate academic outreach programs for underrepresented students. These include (a) setting high standards for program students and staff, (b) providing personalized attention for students, and (c) providing adult role models, peer support, strategically timed college preparation activities, and a long-term investment in students (Gullatt & Jan, 2003).

In 2014, the White House Executive Office of the President compiled a list of promising models and made a call to action to increase college opportunity for low-income students. Key PUPP activities are among the promising interventions outlined in this report, including summer enrichment programs, college visits, and promotion of a strong college-going culture. Generally, college access programs, including PUPP, provide financial aid counseling, college visits, career guidance, tutoring, academic counseling, and test preparation courses (Lerner & Brand, 2006).

Additionally, PUPP's work with PUPP scholars encompasses all three dimensions of college readiness outlined by the College Readiness Indicator Systems (CRIS) initiative, which is developing tools and outlines for supports that help students become college ready. The dimensions of college readiness outlined by CRIS researchers Borsato, Nagaoka, and Foley (2013) are as follows:

- *academic preparedness*: key academic content knowledge and cognitive strategies needed to succeed in college-level work
- *college knowledge*: the knowledge base and contextual skills that enable students to successfully access and navigate college
- *academic tenacity*: the underlying beliefs and attitudes that drive student achievement (p. 31)

PUPP heavily invests in PUPP scholar academic preparation for college course work. This work is considered the most direct strategy for boosting both college attendance and graduation rates for disadvantaged students. This is according to Haskins and Rouse (2013), who also argued that without solid academic preparation, other college access strategies will fall short. The rigor of PUPP's academic preparation is driven by the fact that the program's intention is to prepare students for course work at top colleges and universities.

Princeton University Preparatory Program Logic Model Development

The PUPP logic model was developed through a collaborative process with PUPP staff. ETS research staff reviewed more than a decade of PUPP printed materials and conducted interviews with 10 PUPP staff (including the main PUPP administrative staff and those who work part time on academic enrichment or summer institute implementation). They also conducted 35 interviews with other key stakeholders, such as school principals, counselors, and college admissions

officers, as well as three focus groups with parents and two with PUPP alumni. During these interviews and focus groups, ETS researchers learned about how PUPP has been planned, structured, and implemented since its inception in 2001. Using the information gathered through this process, ETS researchers drafted an initial logic model depicting the program inputs/resources, interventions/activities, outputs, short-term outcomes, and long-term outcomes. This initial draft was reviewed and revised based on feedback provided through separate and joint ETS and PUPP staff meetings and correspondence.

The PUPP logic model (see Figure 2) is broken down into five columns:

- *inputs and resources* (Column 1): These items describe the resources available to implement the program. These include funding, staffing, and facilities.
- *interventions and activities* (Column 2): These describe the activities and actions needed to implement PUPP. PUPP activities are divided into subcategories, which include the summer institute, the academic-year program, social and emotional skills development, college exposure, arts and cultural enrichment, parent workshops, student/family support, and alumni support.
- *outputs* (Column 3): These are measurable, tangible, and direct outcomes as a result of PUPP.
- *short-term outcomes* (Column 4): These are the results that PUPP intends to achieve during the 3 years students are active PUPP scholars.
- *long-term outcomes* (Column 5): These are the results that PUPP intends to achieve among alumni as they enter college and beyond.

Column 1: Inputs and Resources

PUPP implementation depends on the financial and human capital provided by Princeton University and others. PUPP is primarily funded through the Princeton University Provost's Office. However, through the years, individual donors and corporate sponsors have pledged money to the program. The in-kind facilities and infrastructure provided by Princeton University compose a substantial portion of the PUPP budget. The program uses Princeton University facilities, including office space, classrooms, labs, technology, information technology support, and office supplies.

The primary PUPP staff include a half-time director, a half-time associate director, a full-time counselor (established 2007), a half-time administrative support professional, a full-time PUPP Alumni Fellow who serves for 2.5 years (established 2012), and an unpaid part-time social work intern (established 2015). Also, a number of staff are employed to work with PUPP scholars during the academic-year and summer program activities. During the academic year, the program employs 10 part-time teaching fellows, who are Princeton University graduate students and who are responsible for running the academic enrichment programming held at each of the six partner public high schools served by the program.¹ During the 6-week intensive summer institute, the program employs roughly 19 PUPP summer faculty, seven teaching assistants (TAs; these include many PUPP alumni), and one TA liaison. Summer faculty is a mix of independent teaching professionals and those associated with Princeton University or the partnering high schools.

PUPP administration is thoughtful about hiring staff and faculty who are either first-generation college students/graduates or who are at least highly sensitive to the needs and experiences of their students. Programs that employ staff who have strong personal connections or shared backgrounds with their students have been shown to have a positive impact on their students' outcomes (Howley, Chavis, & Kester, 2013). One way that PUPP uses this strategy is by recruiting alumni for employment as summer TAs. In this way, PUPP scholars are exposed to slightly older peers who have successfully made the transition from PUPP to a selective university.

The ability of PUPP staff to connect and communicate with students is a primary consideration for employment. Besides being first-generation college graduates, several PUPP staff are bilingual speakers of Spanish and English, which may help them communicate with the families of Spanish-speaking PUPP scholars and develop relationships with these PUPP scholars based on shared cultural understandings.

Column 2: Interventions and Activities

This section follows the intervention categories outlined in the logic model and briefly reviews the program rationale and research that undergird PUPP activities, including literature that supports the design of the program. Each of the

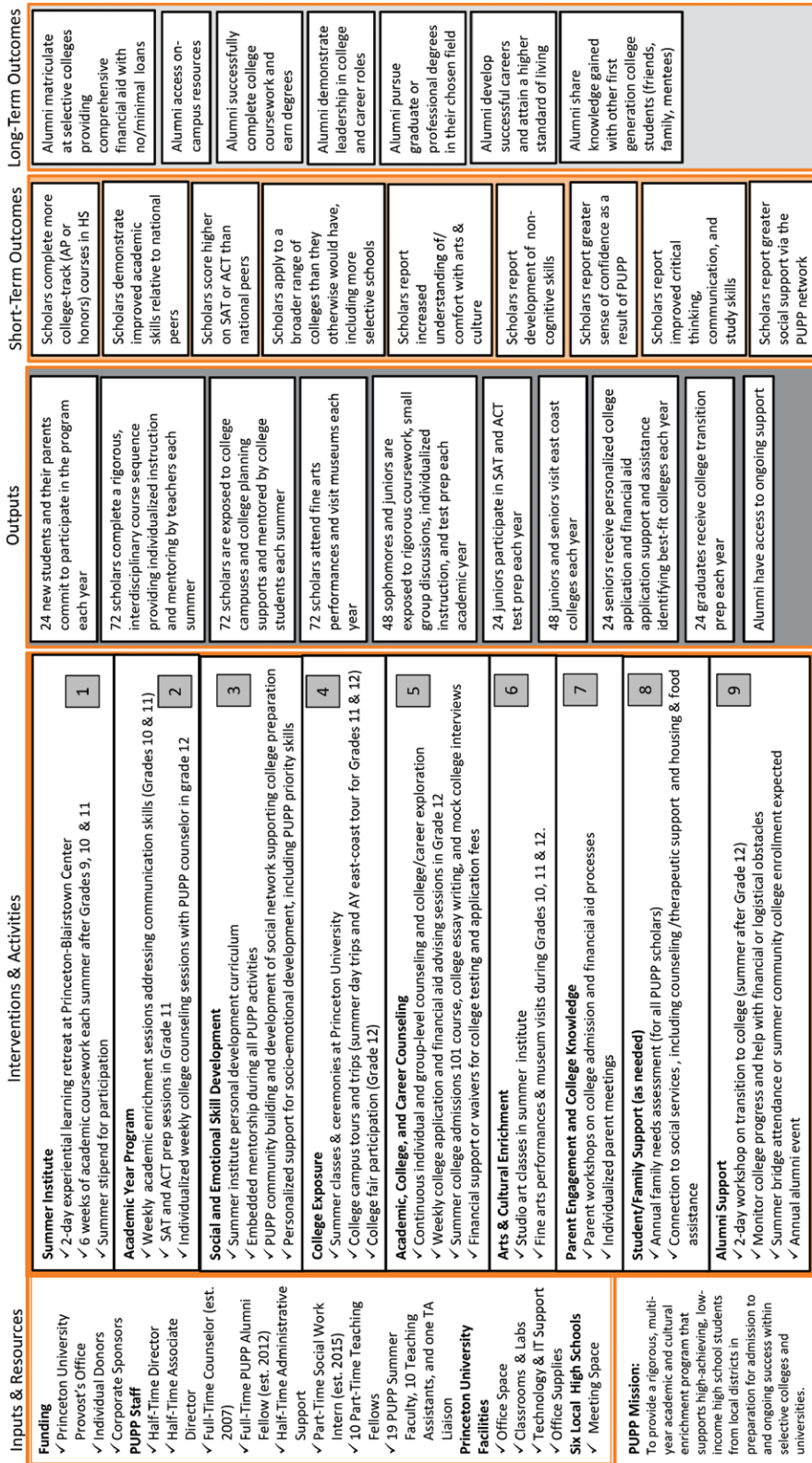


Figure 2 Princeton University Preparatory Program logic model.

interventions/activities outlined in the logic model is discussed in detail: (a) summer institute; (b) academic-year program; (c) social and emotional skill development; (d) college exposure; (e) academic, college, and career counseling; (f) arts and cultural enrichment; (g) parent engagement and college knowledge; (h) student/family support; and (i) alumni support.

PUPP activities fall under two main program components of the PUPP high school scholar experience: the summer institute and the academic-year program. These components provide the activities that support social and emotional skill development; college exposure; academic, college, and career counseling; and arts and cultural enrichment. Additionally, both the PUPP summer institute and the academic-year program provide PUPP scholars with academic enrichment that supplements and builds on what is provided at their respective high schools.

Summer Institute

Experiential Learning

The PUPP summer institute begins with a retreat at the Princeton–Blairstown Center and offers 2 days of experiential and adventure-focused education. For more than 30 years, the significant positive impact of experience-based education programs on the social, psychological, and intellectual development of adolescents has been established (Conrad & Hedin, 1982). At the Princeton–Blairstown Center, PUPP scholars engage in activities that help build self-confidence and teamwork as they (a) complete adventurous tasks that may push personal limits and (b) are asked to support each other through both encouragement and the actual provision of safety measures. Adventure-focused education is thought to promote team building and the development of personal relationships as individuals receive support and give support to others (McKenzie, 2001), which ties to the short-term outcome of greater social support via the PUPP network.

Academic Enrichment

The academic portion of the PUPP summer institute offers PUPP scholars 6 weeks of academic enrichment. Courses are taught in lecture halls, seminar rooms, and labs on the Princeton University campus. The PUPP summer curriculum includes courses in art (studio and appreciation), literature, writing, mathematics, science, and social science. These classes are taught in an interactive seminar format that closely resembles college courses. Courses are intended to be academically rigorous and to expose students to the types of critical thinking called for by many university courses.

In an evaluation of high-impact activities, a rigorous college preparatory curriculum is foremost on the list. Evidence has indicated that the curriculum for such a program should include an appropriate mix of content areas and opportunities to deeply develop writing and critical thinking skills, with the aim that students become fully prepared for college-level course work (FSG Social Impact Advisors, 2010). Major goals of PUPP's exposure to rigorous discourse are critical thinking and the ability to write at a college level. In each of three subsequent summers, the PUPP curriculum focuses on technical writing skills, research writing skills, and personal essay writing. Beyond the specific focus on writing, PUPP works to enhance critical communication skills in general, including reading, writing, thinking, speaking, and listening.

Care is taken to align the PUPP curriculum with college-level course work and experiences. Quality undergraduate experiences are broadly defined as those learning experiences that enable students to acquire knowledge in a variety of disciplines and deep knowledge in at least one discipline, as well as to develop a range of skills and habits of mind that prepare them for career success, engaged citizenship, intercultural competence, social responsibility, and continued intellectual growth. (Machett *et al.*, 2016, p. 2).

PUPP works to cultivate critical thinking and intellectual curiosity through its pedagogy, in the hope that the experiences PUPP scholars have will prepare them for and align with the quality of education one might expect from a selective university.

Additionally, the PUPP curriculum is infused with study skill strategies and learning reflections. Research has shown that explicitly teaching self-regulatory strategies for studying, writing papers, taking exams, and gleaning information from lectures and texts benefits students, improves grades, and results in higher retention and college graduation rates (Wibrowski, Matthews, & Kitsantas, 2017). This skill development work is expected to directly impact the short-term outcome of PUPP scholars demonstrating improved academic skills compared to national peers.

While PUPP scholars are academically high achieving, it is important to note that, in general, low-income youths suffer significant losses of academic skills over the summertime (Alexander, Entwisle, & Olson, 2007). These authors speculate

that this loss is in part caused by low-income young people having fewer educational opportunities available to them over the summer. Thus there is a demonstrated need for high-quality summer learning opportunities for low-income students, which the PUPP summer institute provides.

The summer institute also includes college visits and a curriculum focused on college preparation (e.g., personal development, test preparation, college admissions). These activities are included within the domains of counseling, social and emotional skill development, and college exposure, which are discussed in detail in later sections of this report.

Stipends

PUPP scholars earn stipends (\$750 per summer) for participation in the summer institute. These stipends help replace the income students may have earned through summer employment. Additionally, the money provided to students provides a financial incentive for participation, which may significantly enhance educational performance and study efforts (Kremer, Miguel, & Thornton, 2005). PUPP staff encourage students to save their stipends for future college-related expenses. This practice is supported by Elliot (2013), who found that having funds saved specifically for college expenses might have a stronger effect on college outcomes than having saved funds that can be used for any purpose.

The personal circumstances of many high school students do not necessitate them working to pay for school or other living expenses. Nationally, in 2011, 71% of students aged 16 years and older did not work, with another 28% working less than full time year-round and 1% working full time year-round (Davis, 2012). On the basis of our observations, we inferred that many PUPP students fall into the latter two categories.

It is sometimes reported that PUPP students use their stipends to contribute to their families' living expenses. High school stipend use for family support provides a glimpse of the financial pressures future college-going PUPP alumni will face in terms of lost income. Although it is common for some low-income students to support their family living expenses, this can increase financial pressure on such students, complicate their college experience, and, potentially, compromise their completion of college (Berg, 2010).

Academic-Year Program

Academic Enrichment and Mentoring

The academic-year programming provides the chance for PUPP scholars to experience more academic enrichment through the weekly sessions held at their respective high schools. Princeton University graduate students employed as Teaching Fellows coordinate these sessions, which provides students with young adult mentors. These sessions provide both mentoring and academic enrichment, which have been shown to have benefits for first-generation students (FSG Social Impact Advisors, 2010; Institute for Higher Education Policy [IHEP], 2011). The weekly academic-year sessions provide opportunities for PUPP scholars to engage in discussions of current events, literature, and the college experience.

The small groups facilitate relationship building and mentoring. The PUPP model encourages building relationships to personalize teaching and nurture social-emotional skills, specifically targeting areas of weakness (e.g., communicating verbally in front of a group).

College Entrance Exam Preparation

PUPP juniors receive additional preparation for the SAT[®] test and ACT test throughout the academic year. Research has shown that students with higher socioeconomic status and higher levels of parent education are more likely to take more expensive forms of SAT and ACT test preparation and obtain higher scores on these exams (Park & Becks, 2015). Social class inequities in test preparation, in terms of differential participation in costly tutoring and formal courses (such as those taught by Kaplan and Princeton Review), have at least moderate consequences on test scores and selective college enrollment (Buchmann, Condron, & Roscigno, 2010). SAT gains from private courses are estimated to be between 30 and 40 points. The PUPP ACT and SAT test preparation classes aim to provide rigorous test preparation that is similar to what higher income families are able to provide for their college-bound children. Providing this preparation is intended to directly impact the short-term outcomes of PUPP scholars scoring more highly on these exams than national peers.

Individual College Counseling Attention

For PUPP scholar seniors, the academic-year program includes weekly individualized college counseling and attention provided by the PUPP counselor. This counseling focuses on the college application and decision-making process as well as on applications for financial aid and comparisons of financial aid offers. While seniors receive weekly academic, college, and career-focused supports, all PUPP scholars receive individual attention and support focused on college preparation and exposure as part of the PUPP experience. One of the intended outcomes of this work is that students will select a college or university that will be a good fit for them academically as well as financially. Providing adult relationships that support college aspirations and preparation is a key strategy in helping students navigate the pathway to college (Tierney, Bailey, Constantine, Finkelstein, & Hurd, 2009).

Social and Emotional Skill Development

Although increasing academic preparation is a common focus of college access programs, there is growing recognition that being college ready also requires the development of noncognitive factors—sets of behaviors, skills, attitudes, and strategies that are crucial to academic performance and persistence (Nagaoka et al., 2013). PUPP works directly with PUPP scholars in a number of ways to promote social and emotional learning and the development of noncognitive skills. PUPP efforts include the personal development curriculum taught during PUPP scholars' first summer institute, continuous personalized support for socioemotional development, embedded mentorship, and community building.

Mentorship

PUPP embeds mentoring opportunities in all activities. PUPP scholars can receive mentorship from PUPP staff, PUPP faculty and TAs, and PUPP fellows. Research has shown that mentors serve an important role in college access and success. Mentors can provide high-quality connections and support relationships; help improve focus and motivation to achieve learning goals; and provide information about college preparatory courses, financial aid, and the admissions process (IHEP, 2011).

Building a Positive Social Network

Besides adult and near-peer mentoring, PUPP also offers opportunities for PUPP scholars to develop strong peer relationships within the program. The supportive adults and peers provided through PUPP participation encourage growth and development. Surrounding students with adults and peers who build and support their college-going aspirations is an evidence-based recommendation for helping students navigate the path to college (Tierney et al., 2009). All students benefit from being around adults and peers who challenge them to perform well academically (Education Trust, 2014). Actions in this area directly aim to impact the short-term outcome of PUPP scholars reporting a greater social network because of the program.

Support for Socioemotional Development

PUPP provides personalized support for the development of social–emotional skills. Staff work to understand each student's unique needs in this area and to build relationships and opportunities for young people to grow. PUPP nurtures a sense of community through activities such as the 2-day retreat to the Princeton–Blairstown Center and the publication of summer institute yearbooks. Personalized support for social–emotional skills is additionally facilitated by the low student-to-staff ratios in all PUPP activities.

PUPP further focuses on the development of social–emotional skills with its identification of the PUPP priority skills. These skills, believed to be essential for fostering scholarly and personal success, are part of the larger curriculum. Priority skills include (a) knowledge acquisition, (b) critical thinking, (c) communication, (d) internal attitudes and behaviors, and (e) external attitudes and behaviors (PUPP, 2014). Whereas knowledge acquisition and critical thinking are cognitive skills, the remaining three priority skills could be categorized as social and noncognitive skills.

Noncognitive factors useful for college readiness have been described in five categories: (a) academic behaviors, or those behaviors commonly associated with being a good student, such as completing assignments; (b) academic perseverance,

or the student's ability to remain focused and engaged with work despite distractions, setbacks, or obstacles; (c) social skills, or those interpersonal qualities, such as cooperation, assertion, responsibility, and empathy, that improve social interactions; (d) learning strategies, or the processes and tactics employed to aid cognitive work or thinking, remembering, or learning; and (e) academic mind-sets, or the beliefs, attitudes, or ways of perceiving oneself in relation to learning and intellectual work that promote academic performance. These include academic self-efficacy, a sense of belonging in educational settings, and implicit theories young people have about their abilities (Nagaoka *et al.*, 2013).

The PUPP priority skills include competencies found to be critical for college success, such as study skills, critical thinking, communication, collaboration, perseverance, and time management. PUPP supports development of these skills through its academic and cultural activities as well as through informal mentoring and role modeling. Academic self-efficacy is one of the academic mind-sets or internal behaviors and attitudes addressed by PUPP. First-generation students are more likely to have lower levels of academic self-efficacy than students whose parents attended college (IHEP, 2010). At the university level, academic self-efficacy, or individual belief in personal capacity to complete necessary tasks and achieve goals in the realm of education, has a positive relationship with student grade point average and with the number of credits earned in the first year of college and is a predictor of increased intent to persist to college graduation (IHEP, 2010). PUPP's work on priority skills is expected to impact a number of short-term outcomes, including perceived development of noncognitive skills; a greater sense of self-confidence as a result of the program; and self-reported improvement in critical thinking, communication, and study skills.

College Exposure

PUPP activities encourage engagement on college campuses, which is one of the recommended strategies for improving the college-going success of first-generation, low-income students (Engle & Tinto, 2008). Building college awareness through exposure has long been part of the programs aimed at improving college access among low-income, first-generation youths (Swail & Perna, 2002). It is believed that college exposure is positively associated with educational aspiration and college knowledge.

College Tours and College Fairs

The most common service provided as part of college access programming is college exposure. Attending college visits and college fairs is an integral part of increasing college awareness among disadvantaged students (Swail, 2000). Engle and Tinto (2008) recommended that first-generation students be exposed to the college environment as early as possible through college tours and other college planning activities. PUPP conducts numerous college visits both over the summer and during the academic year, in addition to having students participate in an annual college fair held on Princeton University's campus.

PUPP provides PUPP scholars and their families with extensive college exposure, counseling, and application and financial aid assistance, with the intention of making sure PUPP scholars match and attend the best, and most selective, colleges for them. PUPP scholars are encouraged to target schools that will provide comprehensive financial aid, based on PUPP staff's knowledge of financial aid practices (see the appendix for the list of PUPP-approved target colleges and universities).

Programs on Campus

Precollege programs can help students acclimate to the college environment. Students learn to navigate college life by being exposed to college visits, on-campus academic-year programs, and summer residential programs (Engle, Berneo, & O'Brien, 2006).

Orientation, the opening ceremony, summer programs, awards ceremonies, some of the weekend programs, and PUPP graduation are held on the Princeton University campus. PUPP scholars and their families typically participate in celebratory events. Bonding and recognition rituals and ceremonies are important aspects of successful precollegiate programs (Gullatt & Jan, 2003), as they are also of marked importance to the college experience (Manning, 2000). For PUPP, there is the added benefit that the PUPP rituals are held on Princeton's campus, where PUPP scholars spend a significant amount of time.

Academic, College, and Career Counseling

Academic Counseling

Improving academic preparation for college is a key strategy for promoting college access and success for low-income first-generation students (Engle & Tinto, 2008). Participation in a strong academic program in high school predicts college success better than high grades or college admission test scores. A rigorous high school curriculum has a greater impact on bachelor's degree completion than any other precollege indicator of academic preparation, regardless of socioeconomic status or race (Pathways to College Network, 2004). While all high school courses are expected to improve student skills and knowledge and to prepare them for their postsecondary careers, advanced high school courses, such as calculus, physics, honors, and *Advanced Placement*[®] courses, are intended to provide more academically challenging curricula. Though causality has not been entirely established, many studies have shown that taking more advanced credits in high school increases (a) proficiency on high school achievement and college entrance exams; (b) high school graduation; (c) entry into and performance while in college, including college graduation; and (d) labor market earnings (Long, Conger, & Iatarola, 2012).

Ensuring low-income and first-generation students take a rigorous high school curriculum, including advanced mathematics, greatly increases the chances that they will attend college. Students need information and counseling on rigorous course taking and support to complete challenging course work given gaps in prior preparation (Engle & Tinto, 2008). Per the PUPP *Handbook*, PUPP scholars are expected to keep their grades up and to participate in the most rigorous course work offered at their respective high schools. PUPP staff monitor students' grades and encourage rigorous course taking, including both *AP*[®] courses and honors classes. These efforts are expected to impact the short-term outcome of PUPP scholars completing more college-track courses.

College and Career Counseling

Helping students complete college applications and helping students prepare for entrance exams are important predictors of enrollment (Broton, 2009), which are additional aspects of PUPP's counseling work. Access to college advising is critically important as students prepare to apply to college, yet students from disadvantaged backgrounds have few experts to turn to for support and advice. Evidence has suggested that to address these inequities, we need more counselors and advisors to help guide low-income students through the college application and financial aid processes (Executive Office of the President, 2014).

The College Board (2010) has established eight components of college and career readiness counseling aimed at outlining a systematic approach to the counseling process:

1. college aspirations
2. academic planning for college and career readiness
3. enrichment and extracurricular engagement
4. college and career exploration and selection processes
5. college and career assessments
6. college affordability planning
7. college and career admission processes
8. transition from high school graduation to college enrollment

PUPP's counseling work with PUPP scholars addresses all eight of these components. The PUPP counselor is able to provide attention that many school counselors are unable to provide. Owing to counselor-to-student ratios and the other administrative and reporting demands of their positions, school counselors have limited time for individual student support. The national average caseload for school counselors in 2012 was 367 (Bruce & Bridgeland, 2012), whereas the PUPP caseload is 74.

PUPP support goes beyond having access to a counselor; program activities help students to prepare for college admissions processes. This is done by providing a College Admissions 101 information course as part of summer institute for rising juniors, extensive college admissions essay support, and practice in the form of mock admissions interviews.

Connecting college to job and career interests is an important step in helping first-generation students connect their career aspirations with their college goals and choices (Engle et al., 2006). PUPP provides students with assistance in both

deciding on a career path and finding the best college for them along that path. The process of helping low-income students find the best (and most selective and financially affordable) colleges for them is complicated by the fact that inequality in college access and quality begins with the decision to apply to a college and is influenced by factors including current demographics and high school feeder practices (Black, Cortes, & Lincove, 2015). PUPP staff work with students, families, and even admissions professionals to advocate for PUPP scholars finding the right school for their individual talents, interests, and abilities. The expectation is that these efforts directly impact the long-term outcome of matriculation at a selective college with comprehensive financial aid.

PUPP commits to providing PUPP scholars and their families with the information, resources, and guidance they need to be successful in their highest attainable and most compatible choices for postsecondary education and beyond. The program also works to enhance the talents, strengths, and interests that each PUPP scholar brings to the program (PUPP, 2014). The personalized attention and counseling offered by the program are key program elements supported in the practice literature. Precollege outreach programs that enable staff to know students as individuals with unique needs, strengths, and weaknesses tend to be among the most effective (Gullatt & Jan, 2003). A network of academic and social supports is critical to ensuring students have the opportunity to succeed at high levels (Savitz-Romer, Jager-Hyman, & Coles, 2009). On the pathway to college, students

often face personal, financial, academic, and other challenges that can interfere with their progress. Academic and social supports can help students prepare for the academic rigors of higher education and beyond. Programs that work with individual students where they are can be effective supports to elevate students toward academic excellence. (IHEP, 2013, p. 1).

Arts and Cultural Enrichment

College readiness may also necessitate the development of cultural capital. In addition to lacking financial capital, low-income students may lack the cultural exposure valued as “capital” by institutions like colleges and universities that can lead to academic underperformance (Lamont & Lareau, 1988). A primary goal of PUPP arts and cultural enrichment activities is to expose PUPP students to these types of cultural experiences, which include works of art and arts performances. Helping low-income students develop these types of cultural capital may be especially important for those who are planning to attend selective colleges and universities, where a majority of their middle- and upper-middle-class peers are likely to have been exposed to these types of cultural experiences (DiMaggio, 1982; DiMaggio & Mohr, 1985).

Studio in Art

PUPP provides each PUPP scholar with Studio in Art experiences during summer institute. Art can be thought of as a discipline within general education that complements academic subjects (Greer, 1984). PUPP scholars are asked to take risks, explore their creativity, and meaningfully connect their art to the subjects being explored during summer institute. In this way, PUPP scholars exemplify that the study and practice of making art can help students understand and create objects that are metaphors for things of larger human import (Greer, 1984).

Cultural Excursions

Cultural excursions aimed at providing PUPP scholars with arts and cultural enrichment are an important and unique component of PUPP. These excursions are believed to promote college preparation by exposing PUPP scholars to both classical and contemporary works of art, theater, opera, and dance (PUPP, 2014).

Arts and cultural enrichment trips provide access to our collective cultural heritage, which can be especially important for lower income students, who tend to have fewer opportunities for these kinds of experiences (Hampden-Thompson, Guzman, & Lippman, 2008). Helping low-income students develop their cultural capital is especially important for those who are planning to attend selective colleges and universities, where a majority of their middle- and upper-middle-class peers are likely to have culturally enriched backgrounds (DiMaggio, 1982; DiMaggio & Mohr, 1985).

It has long been established that engaging in cultural experiences, such as museum, theater, and performance arts trips, helps students appreciate the arts and culture. However, a recent study showed that these types of activities may have additional benefits for students, especially for those from less advantaged backgrounds (Greene, Kisida, & Bowen, 2014).

The authors found several positive student outcomes from visiting cultural institutions, including improved knowledge of and critical thinking about art, stronger historical empathy, higher tolerance for differences, and a greater likelihood of visiting cultural institutions in the future.

Parent Engagement and College Knowledge

College access programs that provide parent attention may improve college outcomes by supporting parents as they perform key roles in three main areas: recruitment and enrollment, financial support, and emotional guidance (Leonard, 2013). In the context of differential college enrollment and attainment by socioeconomic status and the role of parents in bridging that divide, it is important that programs and policies empower parents to be involved in shaping their children's educational futures (Rowan-Kenyon, Bell, & Perna, 2008). PUPP does just that through open communication, invitations for participation, and parent workshops on college admissions requirements and financial aid.

Family engagement and parental involvement play a positive role beyond students' K–12 education (Jeynes, 2007) and into their postsecondary careers. For instance, family involvement can facilitate the transition to college, and underrepresented students who experience higher levels of parent involvement and high parental expectations are more likely to enroll in college (Kiyama *et al.*, 2015). Family support has a positive influence on the college persistence of first-generation students, and the perception of family support influences students' ability to manage the academic and emotional rigors of college (IHEP, 2010).

Parent Workshops

Because parent engagement can improve academic success, PUPP works to engage parents with the college preparation process early, during orientation, and throughout the remainder of the PUPP scholars' high school experiences. Numerous parent workshops help provide PUPP parents with basic college knowledge. Students with parents who are knowledgeable about college are more likely to attend college (Broton, 2009).

PUPP empowers families of first-generation students to take ownership of their role in the college readiness of their children. This includes discussing the existing familial capital: the encouragement of their children to do well in school, their desires for their children to further their education, and testimony of the struggles they have experienced without a college education (Kiyama *et al.*, 2015).

College Knowledge and Individual Attention

PUPP provides parents support and workshops on college financial aid. To help low-income, first-generation students reduce the impact of these financial barriers, Engle and Tinto (2008) recommended outreach workshops for students and their parents about the financial aid process and the Free Application for Federal Student Aid, in addition to improved financial understanding of the options for covering the costs of college, including the prudent use of loans. PUPP works with students to minimize the use of student loan debt. According to the Institute for College Access and Success (2013), "although access and completion gaps cannot be closed with financial aid alone, research shows that aid can and does increase enrollment, persistence and completion" (p. 12).

College affordability has become a much greater problem for low-income families as income inequality has increased and the costs of both public and private colleges have continued to rise (College Board, 2015). For more than a decade, it has been acknowledged that financial aid has not kept pace with increasing college costs. Funding for Federal Pell Grant and Work-Study programs have to keep pace with the dramatic increases in college tuition and fees (Engle & Tinto, 2008).

The financial barriers to college access and success for low-income students are formidable. However, there is a tendency for low-income parents and parents of color to overestimate the cost of attending college (Holcomb-McCoy, 2010). Without programs to help improve their awareness, these parents may continue to hold inaccurate knowledge about the actual cost of college.

College access programs, including PUPP, play an important role in ensuring that underserved students and their families receive high-quality information regarding financial support, such as loans and grants (IHEP, 2010). Evidence has shown that students and their families need proactive help in navigating the financial aid system, the type of help provided by PUPP, not simply more information (Scott-Clayton, 2015).

College access programs can provide students and families with accurate information on college pricing and aid package comparison, because net prices matter for college access and choice (Scott-Clayton, 2015). PUPP staff also make sure students complete all necessary paperwork and that the colleges have a complete picture of their financial situations. For example, they encourage students to explain that they are providing an in-kind childcare benefit or working a part-time job to contribute to household income so that financial aid officers better understand the family's finances.

Student and Family Support

PUPP begins with an orientation that includes the signing of a contract that clarifies program expectations between the PUPP scholar, the parent, and the program. These expectations go beyond student performance and include the program's commitments to the PUPP scholars and their families. According to PUPP program director Dr. Klugman (2014), the process is viewed as evidence of "our shared commitment, not just to their academic preparation, but to their health and well-being, and, by extension to the health and well-being of their families" (p. 26). This commitment clearly acknowledges that issues of poverty can get in the way of academic performance and college success. PUPP aims to help families through difficult times and offers general expertise with anything they need.

Needs Assessments

When PUPP staff first meet students and their families, they conduct a needs assessment, which gives them an understanding of the family structure and the resources students have available to them at home (Klugman, 2014). Individual academic support in the form of tutoring is also provided if students are struggling with a particular subject. In 2015, a part-time social work intern was added to the PUPP staff to help connect families to needed external support services and resources. The master's-level social work student intern works with PUPP scholars and their families to provide a bridge between the program, school, and community.

Providing Direct Support and Connections to Social Services

PUPP family support has varied and included money for emergency expenditures, the purchase of prescription eyeglasses for PUPP scholars, the provision of grocery store gift cards for families, and payment for PUPP scholar learning disability assessments or family counseling. Health-related problems can play a major role in limiting students' motivation and ability to learn; interventions aimed at addressing health-related problems, such as vision or learning disabilities, can improve educational outcomes (Bausch, 2010). PUPP has helped families resolve these types of health-related issues.

Support of larger social needs is provided to both current PUPP scholars and their families and to alumni PUPP scholars. PUPP has helped alumni PUPP scholars pay for college fees and provided emergency funds. With the rising cost of college, financially vulnerable students are sometimes without the financial resources to succeed in school and cover their basic needs. Alleviating threats to student well-being, especially in terms of housing and food insecurity, is an important component of enhancing college persistence for first-generation and low-income students. The provision of small grants and emergency aid may help by making sure that financial emergencies do not derail their dreams of obtaining college degrees (Dachelet & Goldrick-Rab, 2015).

Alumni Support

Transition to College

In comparison to high achievers from the top economic half, high-achieving twelfth graders from the bottom economic half are almost as likely to enter college, but far less likely to graduate. (Wyner, Bridgeland, & DiIulio, 2007, p. 21)

Considering this disparity, it is no surprise that low-income, first-generation students need considerable support in making the transition to college (Engle & Tinto, 2008). First-generation students can struggle to find their place on campus, as they may search for a cohort of students with similar backgrounds and economic constraints:

Research as shown that low-income first-generation students are less likely to be engaged in academic and social experiences that foster success in college, such as study groups, interacting with faculty and other students, participating in extracurricular activities and using support services. (Engle & Tinto, 2008, p. 3).

The absence of social supports in college can be a challenge even to the brightest college students. PUPP teaches students to be self-advocates and to ask questions. Programs that assist students in establishing and sustaining faculty and staff relationships and that encourage them to ask for and feel comfortable receiving help may be beneficial (IHEP, 2010). Strategies that have been shown to help include early interventions like summer bridge programs and orientations and advising, tutoring, and mentoring by faculty and peers (Engle & Tinto, 2008).

PUPP scholars participate in a 2-day workshop the summer before entering college. The workshop covers why students should access resources like the writing center, who and what college organization to talk to for specific issues, and why students should go to professors' office hours. PUPP staff address the idea that PUPP scholars need to be intentional about building a support system once they arrive on campus. This is especially important given that the alienation of low-income and underrepresented students of color at elite, majority-White institutions is a well-documented issue (Brown-Nagin, 2016). Therefore PUPP encourages its PUPP scholars to seek out supportive relationships on campus, which is an important intervention strategy in helping students transition to a university (Grant-Vallone, Reid, Umali, & Pohlert, 2014).

Summer Bridge

Additionally, graduating PUPP scholars are asked to attend the Summer Bridge programs at their intended colleges or to take classes at the local community college with additional support from PUPP staff. Summer Bridge programs are designed to improve preparation and ease the transition to college, through providing exposure to coursework and the university and its support services. Participation in summer bridge programs has been shown to improve student retention and graduation rates (Wibrowski et al., 2017).

Checking in and Continued Support of the Positive Social Network

PUPP staff strive to visit PUPP scholars at local and regional colleges to check in with them in person. The only impediments to carrying out this goal are time and money. These visits serve multiple purposes. The primary purpose is for PUPP staff to gauge for themselves how students are faring in college. A second aim is to encourage PUPP scholars to make connections with staff at their attending colleges, some of whom are connected to PUPP. The third aim is for PUPP to maintain relationships with college admissions staff and student support staff, who might reach out to PUPP staff if they learn about a PUPP scholar facing a challenge.

PUPP continues to provide of a peer network through alumni events and social media connections. Strong peer support networks have been shown to strengthen the academic and social development of first-generation and racial/ethnic minority students (IHEP, 2010).

Column 3: Outputs

The PUPP outputs are the measureable, tangible, and direct results of the program. These are the operational indicators of PUPP implementation achievements, including enrollment of a full cohort of new PUPP scholars ($N = 24$); holding a summer institute; and providing college exposure, academic enrichment services, college entrance exam preparation classes, college tours, and application, financial aid, transition to college, and alumni support.

Upon enrollment into PUPP, 100% of PUPP scholars over the course of the program will experience or participate in the following PUPP output activities/products:

- *summer institute*: All PUPP scholars complete a rigorous, interdisciplinary course sequence providing individualized instruction and mentoring by teachers each summer.
- *college exposure*: PUPP scholars are exposed to college campuses and college planning supports and are mentored by college students each summer.
- *cultural enrichment*: PUPP scholars attend fine arts performances and visit museums each year.
- *academic-year enrichment*: All PUPP scholars who are sophomores and juniors are exposed to rigorous course work, small-group discussions, individualized instruction, and test preparation each academic year.
- *college entrance exam preparation*: All PUPP scholars who are high school juniors participate in SAT and ACT test preparation each year.

- *college tours*: All PUPP scholars who are juniors and seniors visit East Coast colleges each year.
- *application and financial aid support*: All PUPP scholar seniors receive personalized college application and financial aid application support and assistance identifying best-fit colleges each year.
- *transition to college support*: All recent PUPP high school graduates receive college transition preparation each year.
- *alumni support*: All PUPP alumni have access to ongoing support.

This means that the full complement of PUPP scholars is exposed to the interventions and activities that the previously cited research has indicated can lead to the intended short-term and long-term outcomes.

Columns 4 and 5: Outcomes, Short Term and Long Term

Short-Term Outcomes

We have shown that PUPP interventions and activities may lead to these short-term outcomes for PUPP scholars. These are important outcomes: Many are related to academic performance, which PUPP aims to enhance through the evidence-based interventions previously discussed, including academic enrichment, college entrance examination preparation, academic counseling, and the development of academic tenacity (Engle *et al.*, 2006; FSG Social Impact Advisors, 2010). These expected academic outcomes include (a) completing more college-track classes (AP and honors), (b) demonstrating improved academic skills, and (c) scoring more highly on the ACT and/or SAT tests. PUPP activities and counseling intervene directly on these outcome areas by providing study sessions and counseling on how to achieve these expectations for performance, which are explicitly part of the PUPP *Student Handbook*.

Other short-term outcomes are related to specific PUPP activities, such as arts and cultural enrichment, development of the PUPP priority skills, and the intentional development of a PUPP network of social support. Again, PUPP interventions directly target these outcome areas and there is the expectation that PUPP scholars and alumni will report outcomes including awareness, experience, or skill development in these outcome areas.

It is anticipated that the cumulative effect of PUPP activities will enable PUPP to meet the goals implicit in PUPP's mission to promote the acceptance and success of low-income, high-achieving students at selective colleges, which is the core of PUPP's long-term intentions.

Long-Term Outcomes

The primary long-term outcomes for PUPP are for its alumni PUPP scholars to matriculate at and graduate from selective colleges and universities. The selective sector of higher education tends to enroll a small portion of students from lower income backgrounds, with only 10% of students enrolled in highly selective colleges coming from the bottom 40% of the national income distribution (Hillman, 2012). While low-income students remain underrepresented at top colleges, many qualified low-income students choose not to apply to or attend these schools. According to Hoxby and Avery (2012), a vast majority of very high achieving students who are low income do not apply to any selective college or university, despite the fact that selective institutions would often cost them less because of the generous financial aid available at these schools. PUPP provides extensive college exposure, counseling, and application and financial aid assistance with the intention of making sure PUPP scholars match and attend the best, and most selective, colleges for them.

It is also expected that PUPP college exposure and alumni support will help alumni students access on-campus resources. PUPP scholars are trained in how to do this during their final PUPP workshops, held the summer before they attend college.

The remaining projected long-term outcomes for alumni PUPP scholars are associated with their broader success and leadership skills, which are expected to be built upon during the PUPP experience. Prior research has shown that low-income students who graduate from selective colleges have higher incomes and standards of living than comparable students who choose not to go to a selective school (Dale & Krueger, 2002). Additionally, academic and social engagement during college has been found to have differential effects on early career and labor market earnings, adding evidence to theories related to the lasting influence of student engagement in college (Hu & Wolniak, 2013). Academic and social engagement in college is one of the goals PUPP staff expect to accomplish through their high school program and alumni support services. Thus, between the expectation to attend a selective college and the alumni support provided, it hoped

that the PUPP experience helps PUPP scholars have higher career earnings. Additionally, PUPP intends for PUPP scholars to demonstrate leadership in college and career and to pursue higher rates of graduate- and professional-level education.

An expectation of the PUPP model, in the form of a long-term outcome, is that PUPP alumni will share their experiences and mentor other first-generation students. One method to encourage this is with frequent use of the PUPP alumni for current PUPP scholar programs and presentations. Additionally, PUPP alumni are frequently employed by PUPP as Teaching Fellows and Summer TAs. The Alumni Coordinator is a PUPP alumna herself. Peer mentorship has been shown to be an effective practice in helping promote college-going through sharing information and providing encouragement and firsthand perspective on the college experience (Castelman & Page, 2015).

It has been suggested that diversity experiences help college students become civically minded (Cole & Zhou, 2014). PUPP alumni PUPP scholars become ambassadors of diverse experience in their pursuit of higher education at selective colleges and universities. It is not a surprise that these young people are more likely to be civically involved and service oriented.

Conclusion

PUPP aims to help high-achieving, low-income Princeton-area youths gain admittance to and graduate from selective colleges and universities. This is done through the monetary and in-kind support of Princeton University, strategic hiring practices, and a set of thoughtful and intentional interventions, including summer institute; an academic-year program; social and emotional skill development; college exposure; academic, college, and career counseling; arts and cultural enrichment; parent engagement and college knowledge; family/student support; and alumni support.

Notes

- 1 PUPP partners with Ewing High School, Nottingham High School, Lawrence High School, Princeton High School, Trenton Central High School, and Trenton West High School.

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Appendix: Princeton University Preparatory Program–Approved Target Colleges and Universities

● ***New Jersey State Schools (New Jersey Tuition Aid Grant Award)***

The College of New Jersey
 Kean University
 Montclair State University
 New Jersey Institute of Technology
 Ramapo College of New Jersey
 Richard Stockton College of New Jersey
 Rowan University
 Rutgers (New Brunswick, Newark, Camden)
 William Paterson University

● ***New Jersey Private Schools (Higher Total Costs; Tuition Aid Grant Award; Potential for Full Aid/PUPP scholarships and Grants)***

Drew University
 Princeton University
 Stevens Institute of Technology

● ***Remotely Possible: Not Recommended as These Schools Do Not Meet 100% of Financial Need***

College of St. Elizabeth
 Fairleigh Dickinson University
 Monmouth University
 Rider University
 Seton Hall University

● ***New Jersey Tuition Aid Grant Awards, Academic Year 2015–2016****

County colleges, \$2,628
 State colleges and universities, \$6,958
 Independent colleges and universities, \$12,169
 Rutgers (New Brunswick, Newark, Camden), \$9,284
 New Jersey Institute of Technology, \$10,772
 Rowan University, \$7,922 (State of New Jersey Higher Education Student Assistance Authority, 2015)

● ***National Universities: Top-Tier Institutions That Meet Most or All of Student Financial Need***

Boston College (MA)
 Brown University (RI)
 Bryn Mawr College (PA)
 Bucknell University (PA)
 Clark University (MA)
 Colgate University (NY)
 Columbia University (NY)
 Cornell University (NY)
 Dartmouth College (NH)
 Davidson College (NC)
 Duke University (NC)
 Emory University (GA)

Georgetown University (DC)
 Harvard University (MA)
 Johns Hopkins University (MD)
 Lehigh University (PA)
 Northwestern University (IL)
 Princeton University (NJ)
 Rice University (TX)
 Stanford University (CA)
 Tufts University (MA)
 University of Chicago (IL)
 University of Notre Dame (IN)
 University of Pennsylvania (PA)
 University of Richmond (VA)
 University of Rochester (NY)
 Vanderbilt University (TN)
 Washington University, St. Louis, (MO)
 Yale University (CT)

• ***National Small Liberal Arts Colleges: Top-Tier Institutions That Meet Most or All of Student Financial Need***

Amherst College (MA)
 Barnard College (NY)
 Bates College (ME)
 Bowdoin College (ME)
 Bryn Mawr College (PA; women's college)
 Carleton College (MN)
 Claremont McKenna College (CA)
 Colby College (ME)
 Davidson College (NC)
 Dickinson College (PA)
 Franklin and Marshall College (PA)
 Gettysburg College (PA)
 Hamilton College (NY)
 Harvey Mudd College (CA)
 Haverford College (PA)
 Kenyon College (OH)
 Lafayette College (PA)
 Middlebury College (VT)
 Mount Holyoke College (MA; women's college)
 Oberlin College (OH)
 Occidental College (CA)
 Pitzer College (CA)
 Pomona College (CA)
 Reed College (OR)
 Scripps College (CA; women's college)
 Smith College (MA; women's college)
 Swarthmore College (NY)
 Trinity College (CT)
 Union College (NY)
 Vassar College (NY)

Wellesley College (MA; women's college)
Wesleyan University (MA)
Williams College (MA)

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