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Genesys Works Bay Area

Final Evaluation Report

GENESYS WORKS.

harder + co | community research

Contents

Executive Summary

Genesys Works, a national program that provides professional job skills training and internships to low-income high school students, received funding in 2012 from Pacific Gas & Electric, AT&T, and the GreenLight Fund's Social Innovation Fund (SIF) Initiative to expand its program to the San Francisco Bay Area, including sites in San Francisco, Oakland, and San Jose. In 2013, Genesys Works Bay Area (GWBA) partnered with Harder+Company Community Research to conduct an evaluation of its program.

Exhibit ES1. Program Timeline

As shown in Exhibit ES1, the program has four main components: (1) an eight-week **summer training program** between participants' junior and senior years of high school that focuses on technical skills and professional communication skills for the workplace; (2) a **year-long, part-time (20 hour/week) paid internship** in a professional setting during participants' senior year; (3) **ongoing college and career coaching and support**; and (4) **alumni services** to help participants transition into college and get the support they need to stay in school.

The evaluation includes three components – an implementation study, an outcome study, and an impact study – as illustrated in Exhibit ES2 below.

Exhibit ES2. Evaluation Components

Component	Purpose	Data Collection
Implementation Study	• Document program structure and outputs • Determine the extent to which GWBA is serving the intended target population • Assess participants' satisfaction and program quality	• Review of program data • Key stakeholder interviews • Participant focus groups • Satisfaction surveys
Outcome Study	• Determine how student attitudes, experiences and skills changed over the course of the program	• Baseline and annual follow-up surveys of participants
Impact Study	• Measure the program's impact on high school graduation, college enrollment, and college persistence	• School district administrative data

For the impact study, we applied propensity score matching (PSM) techniques to create two comparison groups: (1) students who were in the same graduating cohort as GWBA students and attended schools with similar characteristics that were not served by the Genesys Works program, and (2) students who attended the same schools, but were seniors in the year prior to the Genesys Works program

starting. We then estimated impact by measuring the mean differences in the three key outcomes between the GWBA participants and the two comparison groups.

Findings from the Implementation Study

The implementation study relied on a review of program data, interviews with school champions and corporate partners, participant focus groups, and program satisfaction surveys.

The GWBA program scaled up quickly. As shown in Exhibit ES3, GWBA started small in 2013 with 29 participants across five high schools in San Francisco and Oakland. The program rapidly scaled up by expanding to new schools in San Francisco, Oakland, and San Jose. By 2017, the program was working with 32 schools and 162 students in Cohort 5. In the first five years, GWBA has served a cumulative total of 486 students. While GWBA may not have reached its initial goal of serving 700+ students, the program nonetheless scaled quite rapidly.

The program served its intended target population. Large majorities of the participating students in each cohort were low-income (63 – 80%) and first generation students (53 – 77%). GWBA adapted its practices over the course of the five-year period to better reach these students by working with schools to formalize the definition of the target population and implement more focused criteria for targeting students during the outreach process.

The program mostly achieved its participant retention goals. GWBA anticipated a certain amount of program attrition, knowing that not all students would be able to balance the demands of the program with their academic and personal commitments. As shown in Exhibit ES4, GWBA achieved—or came close to achieving—its retention goals for summer training with every cohort except Cohort 1. The program exceeded its retention goals for the internship with every cohort except Cohort 3, where it came very close. Overall program retention fluctuated between 65 percent (Cohort 1 and 5) and 74 percent (Cohort 2).

Participants reported high levels of satisfaction with all components of the program. Almost all GWBA participants (98%) described the summer training program as either "excellent" or "good." Similarly, a large majority of participants described the internship (90%) and the alumni program (81%) as either "excellent" or "good."

Exhibit ES3. Number of Students Recruited

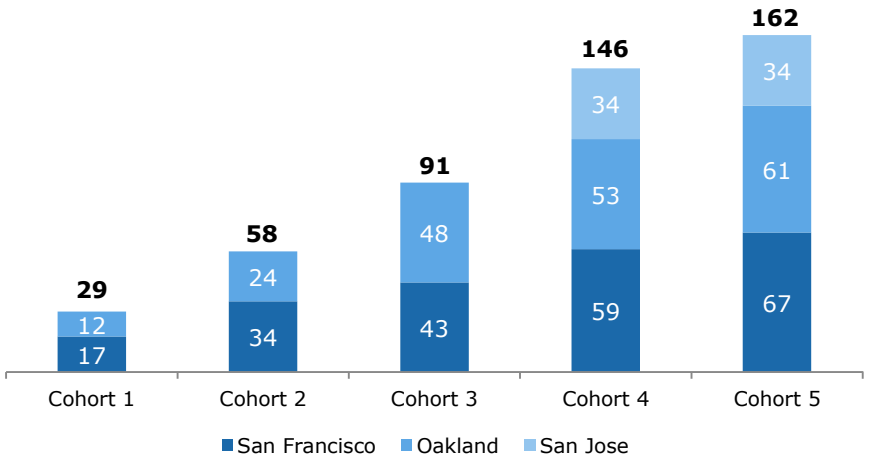


Exhibit ES4. Program Retention Rates*

Stage	Total #	Total Retention Rate	GOAL
Showed up to 1st day of summer program	486		
Completed the summer program	381	78%	**80%**
Placed in an internship	353		
Completed internship (Total program attrition rate)	330	93% (68%)	**90%** **(72%)**

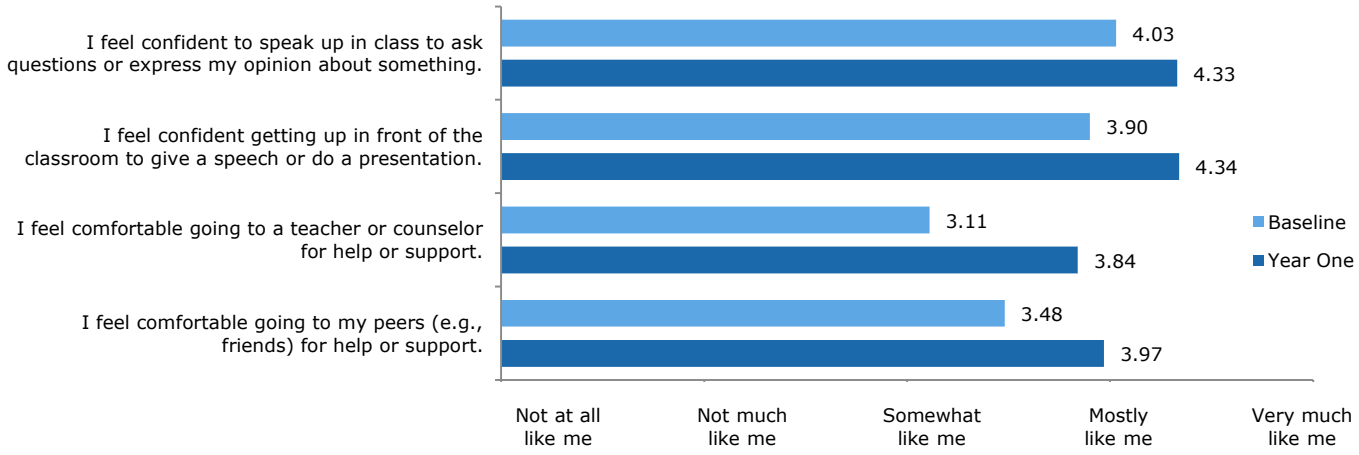
*Includes numbers from all five cohorts of students.

Findings from the Outcome Study

As part of the outcome study, follow-up surveys were conducted at the end of the summer after students had completed their internships. Over the course of the evaluation, these surveys were conducted for Cohorts 2, 3 and 4 with response rates ranging from 59 to 73 percent. The evaluation found small but statistically significant changes across a number of key measures that were consistent with the theory of change and GWBA program goals:

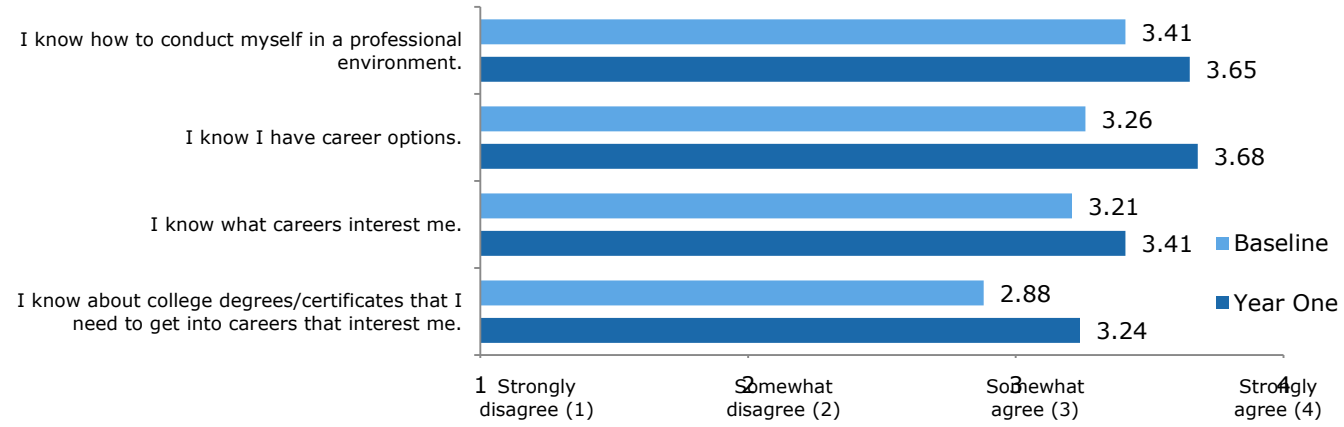
Participants had increased confidence in the classroom. The biggest changes between baseline and follow-up were participants' confidence speaking in public and self-advocacy in the classroom. As shown in Exhibit ES5, participants reported increased levels of confidence giving a speech or presentation and speaking up or expressing their opinion in class. Related to these increases in classroom confidence, students were more likely to report increased comfort reaching out to teachers and peers for support.

Exhibit ES5. Changes in Classroom/School Confidence



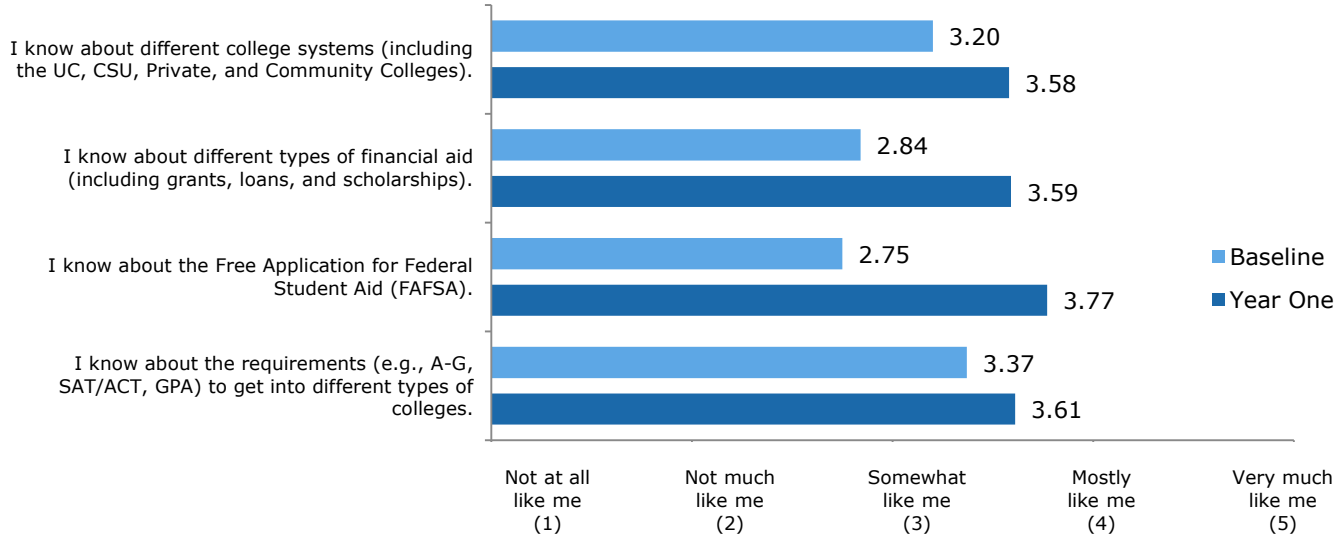
Participants were more comfortable in professional settings and feel more optimistic about their career options. As shown in Exhibit ES6, participants reported growth in how comfortable and confident they feel in a professional environment. They also reported having more knowledge about their career options, what interests them, and what education they need to achieve their professional goals.

Exhibit ES6. Changes in Levels of Professional/Career Confidence



Participants knew more about their postsecondary options. Also consistent with the theory of change, as shown in Exhibit ES7, students reported greater knowledge about college systems and navigating the application process and financial aid requirements. Related to these findings, almost half of participants reported decreased anxiety about not having the financial resources necessary to attend college. The information and assistance that participants receive in the program to understand and apply for financial aid likely contributed to this change.

Exhibit ES7. Changes in Knowledge about Postsecondary Opportunities



Follow-up surveys in the second year provided evidence that GWBA participants are staying in college and pursuing additional professional experiences. Program alumni reported slight decreases in academic and professional confidence from the first year, but the levels are still higher than at baseline. Alumni reported being *less* concerned about being able to pay for college. In addition, over half (59%) had a job during their first year of college, many in professional internships.

Impact Analysis

Exhibit ES8 provides an overview of the findings for each of the two comparison groups across the three key outcomes. As the table illustrates, the following themes emerged:

- **GWBA had a positive impact on high school graduation rates.** In both Group 1 and Group 2, the analysis found similar and statistically significant impacts on high school graduation rates. For both groups, 99 percent of the GWBA students in the sample graduated from high school, compared with 84 percent of the comparison students in Group 1 and 89 percent of the comparison students in Group 2.

- **Both analyses show a positive impact on college enrollment and persistence, but the size and statistical significance varies considerably between the two comparison groups.** The impact analysis for Group 1 found larger and statistically significant impacts on both college enrollment and college persistence (26 and 16 percentage points, respectively) as compared with Group 2. Group 2 impacts were much smaller (3 and 5 percentage points, respectively) and were not statistically significant.

Exhibit ES8. Impact of GWBA on Key Outcomes

Stage	Group 1						Group 2					
	same year, different school						same school, different year					
	GWBA		Non-GWBA		Difference (p value)	Effect Size (interpretation)	GWBA		Non-GWBA		Difference (p value)	Effect Size (interpretation)
	n	%	n	%			n	%	n	%		
High School Graduation Rate	199	99%	169	84%	15%** (.00)	.55 intermediate	210	99%	206	89%	9%** (.00)	.40 small
College Enrollment Rate	220	75%	194	49%	26%** (.00)	.55 intermediate	225	78%	207	75%	3% (.41)	.08 none
College Persistence Rate	123	72%	112	56%	16%** (.00)	.34 small	125	78%	207	73%	5% (.34)	.10 none

*Statistically significant at the .05 level. (None at this level)
**Statistically significant at the .01 level.

Conclusion

All in all, the evaluation of the GWBA program demonstrated positive results. The program was able to scale up considerably over the course of five years, and improvements in recruitment strategies led to better targeting of low-income and first generation students. Participants, school champions, and corporate partners were largely satisfied with the program. Short-term participant outcomes, including academic and professional skills and confidence, were in line with the program's logic model and theory of change, and the program demonstrated statistically significant, positive impacts on all three key outcomes: high school graduation, college enrollment, and college persistence.

Introduction

Background

Genesys Works, a national program that provides professional job skills training and internships to low-income high school students, received funding in 2012 from Pacific Gas & Electric, AT&T, and the GreenLight Fund's Social Innovation Fund (SIF) Initiative to expand its program to the San Francisco Bay Area, including sites in San Francisco, Oakland, and San Jose. Genesys Works Bay Area (GWBA) began program operations in 2013 with the goal of enrolling a cumulative total of 700 participants over a five-year period. The program has four main components:

- An eight-week **summer training program** between participants' junior and senior years of high school that focuses on technical skills and professional communication skills for the workplace;
- A **year-long, part-time (20 hour/week) paid internship** in a professional setting during participants' senior year;
- **Ongoing college and career coaching and support from program staff** to enhance internship performance, encourage participants to complete high school, explore and apply for post-secondary education, and pursue a professional career track; and
- **Alumni services** to help participants transition into college and get the support they need to stay in school.

In 2013, GWBA partnered with Harder+Company Community Research to conduct an independent third party evaluation of its program. The evaluation includes three components: (1) an implementation study to examine fidelity to the program model; (2) an outcome study to measure changes in participants' professional skills and educational/career goals; and (3) an impact study to assess the program's effect on high school graduation rates, and college enrollment and persistence.

About this Report

This final report is intended to: (1) document lessons learned from program implementation, and any adaptations that were made, (2) describe outcomes and impact of the GWBA program, and (3) meet federal reporting requirements for SIF funding. Based on detailed guidance from SIF, this report is organized into six sections that describe:

- Program Model and Theory of Change
- Study Approach and Methods
- Findings from the Implementation Study
- Findings from the Outcome Study
- Findings from the Impact Study
- Implications for Program Operations and Future Research

The appendices provide more detailed information on the GWBA logic model; research questions and data collection; and analytical methods and procedures.

Program Model and Theory of Change

The Genesys Works program was developed in response to the question: *How can we remove the obstacles that low-income youth face in achieving college and career success?* Post-secondary education and meaningful early employment experiences are strong predictors of future success and earning potential,[1,2] and youth from low-income households—especially those who would be first in their family to attend college ("first generation")—often do not have access to these educational and employment opportunities for a variety of reasons:

- **High schools are often focused more on graduation rates than truly preparing students for both college and career.** A recent report by The Education Trust states that only 8 percent of students complete a full college- and career-prep curriculum, and students from low socioeconomic backgrounds were 14 percentage points less likely to complete a college-prep sequence than their more advantaged peers.[3]

- **Low-income and first generation students need support to navigate the college enrollment process.** Research shows that many of these students lack the knowledge they need to apply for college, receive the necessary financial aid, and select an appropriate school for their educational goals.[4,5]

- **Professional work experience opportunities are often not available to low-income youth.** While employers are increasingly looking for employees with relevant work experience, professional internships are often unpaid. Thus, these types of opportunities are not feasible for students who need paid work in order to make ends meet.[6]

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[1] McFarland, J., et al. The Condition of Education 2018. (May, 2018). *National Center for Education Statistics (NCES).* Retrieved from https://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2018144

[2] Simons, L., et al. Lessons Learned from Experiential Learning: What do students learn from a practicum/internship? (2012). *International Journal of Teaching and Learning in Higher Education* (Volume 24, Number 3). Retrieved from https://files.eric.ed.gov/fulltext/EJ1000685.pdf

[3] Bromberg, M. and Theokas, C. Meandering Towards Graduation: Transcript outcomes of high school graduates. (April, 2016). *The Education Trust.* Retrieved from https://1k9ql1yevnfp2lpq1dhrqe17-wpengine.netdna-ssl.com/wp-content/uploads/2014/09/MeanderingTowardGraduation_EdTrust_April2016.pdf

[4] Armstrong, K., Arnold, K., and Lu, E. The Ecology of College Readiness. (2012). *ASHE Higher Education Report*, (Volume 38, Number 5). Retrieved from https://eric.ed.gov/?id=EJ1013198

[5] Cataldi, E.F., Bennett, C., and Chen, X. First-Generation Students: College access, persistence, and postbachelor's outcomes. (February, 2018). *National Center for Education Statistics (NCES).* Retrieved from https://files.eric.ed.gov/fulltext/ED580935.pdf

[6] Edwards, K.A. and Hertel-Fernandez, A. Paving the Way Through Paid Internships: A proposal to expand educational and economic opportunities for low-income college students. (2010). *Dēmos: A Network for Ideas and Action*. Retrieved from https://www.demos.org/sites/default/files/publications/PavingWay_PaidInternships_Demos.pdf

Program Model

The Genesys Works program model aims to address these issues through a combination of professional skills training, paid internship opportunities, and long-term college and career support for high school students as they transition into college. The program began in Houston in 2002 and has been replicated in other cities across the United States including Chicago, Minneapolis/St. Paul, and Washington, DC. The program provides high school students with in-depth summer training and year-long professional internships. It is a deep-touch workforce development model that includes more than 1,200 hours of programming over 14 months as shown in Exhibit 1 below.

Exhibit 1. Program Timeline

Summer Training Program. This intensive eight-week training program takes place between participants' junior and senior years in high school. Participants receive job skills training specific to their upcoming corporate internships. GWBA has established an information technology (IT) training program to ensure that participants develop the technical skills necessary to begin their internship. They are also trained in professional skills, including knowing how to dress, interact, and communicate in a corporate setting.

Year-long Professional Internship. In the fall of their senior year, after they have completed the summer training program, participants continue to attend high school in the morning and work in a meaningful internship in the afternoon (15-20 hours/week). They intern in major departments including IT, engineering/drafting, accounting, and finance. This work experience differs from other internships in a number of ways:

- Instead of "job shadowing" and simple clerical work, GWBA internships offer a deep-touch, hands-on, and practical experience.
- Because the jobs last for a full year, participants have the opportunity to perform tasks that directly contribute to the success of their companies, a benefit to both the participant and the host company.
- Participants receive pay for the work they do. Over the course of the year, they can earn an average of $9,000 for themselves and their families.
- GWBA connects participants with a supervisor and team members who provide mentorship, effectively engaging them as partners and building youth professional development.

College and Career Readiness. During the internship year, participants attend a weekly Career and College Connection (CCC) program at a Genesys Works training center. This component of the program helps participants set career goals, connects these career goals to education planning, and teaches skills about college applications and financial aid. Each participant receives direct, one-on-one

assistance from a program coordinator, as well as guidance and advice from local organizations and university representatives.

Alumni Services. In 2014, GWBA added an alumni component designed to provide the support that students need to stay in college and gain additional professional work experience. Alumni receive assistance with personal, academic, and financial aid issues, as well as help connecting with a wide variety of student supports on campus, including the Educational Opportunity Program (EOP)—a service in the California State/University of California system designed to help low-income and first generation college students. The alumni coordinator reaches out to alumni at key intervals (roughly on a quarterly basis) for formal check-ins and more regularly for informal check-ins by text, email, or phone.

Program Inputs

Implementing this intensive program model requires considerable investment from funders, staff, students, and community stakeholders. Exhibit 2 describes the program inputs necessary to operate this program.

Exhibit 2. GWBA Program Inputs

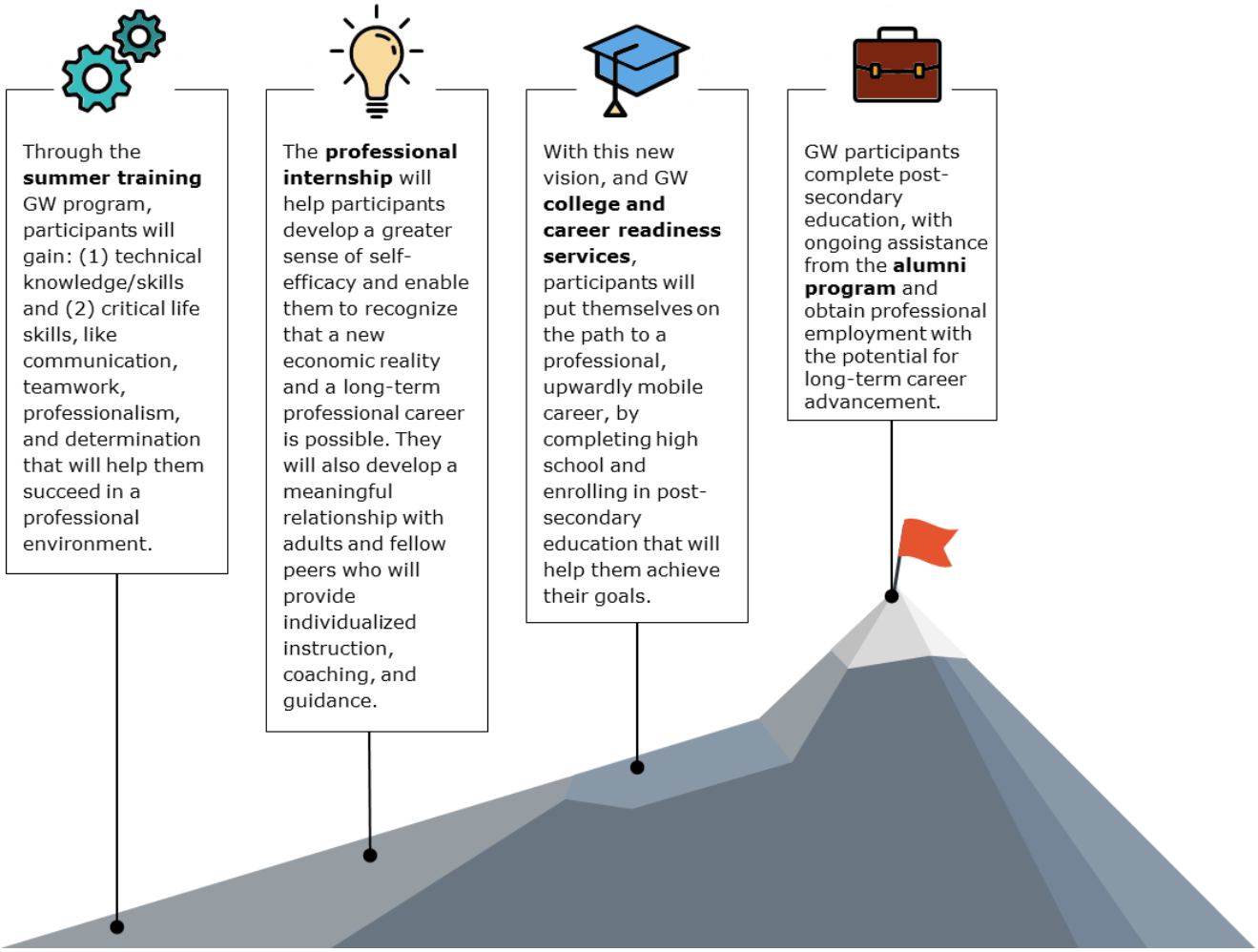
Program Input	Description
GWBA Staff	Staff operates all aspects of the program including outreach to high school and corporate partners, recruitment of students, summer training, and college and career services support during students' senior year.
Program Funding	GWBA receives funding from many philanthropic and corporate funders including the GreenLight Fund, PG&E, AT&T, Google, Salesforce.org, Sobrato Family Foundation, Tipping Point Community, Peery Foundation, and the JPMorgan Foundation.
Participating Students	GWBA defines its target population as high school students from low-income families and who may become the first generation to attend college.
School Champions	Key "champions" from participating schools work with GWBA staff to recruit students, set up academic schedules that are compatible with the internship, and monitor student progress in the program.
Corporate Partners	These partners host high schools students in a year-long professional internship and pay their wages. Partners also ensure an attentive corporate staff supervisor is assigned to support each intern.

Theory of Change

As shown in the illustration below (Exhibit 3), the Genesys Works program model is rooted in a theory of change that posits that a combination of technical and professional skills training, and support from program staff and peers, will result in a successful professional internship experience. This experience, along with additional college and career support, will motivate participants to complete high school and enroll in college. Students will continue to pursue their educational and

employment goals with ongoing support from the alumni program, obtain a degree, and pursue a professional career with both earning and advancement potential.

Exhibit 3. Genesys Work Theory of Change



The Genesys Works theory of change also describes the following **community- and systems-level impacts**:

- Program participants serve as an example to peers and family members. As they develop a sense of purpose in their education, increase their self-confidence, and succeed in a corporate setting, they inspire others outside of the program to raise their own life aspirations and academic pursuits.
- High schools recognize the value of the multiple pathways approach to success for economically disadvantaged students and incorporate work education opportunities and programs into secondary schools.
- Corporate/private sector employers recognize the value of working with students for current business needs and proactively work with secondary schools to design and offer internship programs.

Appendix A includes a logic model that provides detailed information about the program model, program outputs, and outcomes.

Study Approach and Methods

In fall 2013, GWBA partnered with Harder+Company Community Research to conduct an independent third-party evaluation of its program for its first five years. The evaluation includes three components: (1) **implementation study** to document program structure and effectiveness, and examine fidelity to the program model; (2) an **outcome study** to measure how participants' circumstances, attitudes, and outcomes change over time; and (3) an **impact study** to assess the program's effect on high school graduation, and college enrollment and persistence. Exhibit 4 provides an overview of the primary research questions for each evaluation component.

A more detailed list of research questions and corresponding data collection and analytical methods are included in Appendix B.

Exhibit 4. Primary Research Questions for Each Evaluation Component

Evaluation Component	Research Questions
Implementation Study	• Did GWBA implement the program with fidelity to the program model and goals? What changes were made and why? • What challenges did the program face in implementing the program and how were they addressed? • Was the program able to reach the intended target population? Did it meet enrollment and retention goals? • Were participants and corporate partners satisfied with the program?
Outcome Study	• During the study period, what changes occurred among participants in terms of skill development, college and career aspirations, preparation for post-secondary enrollment, and resources and networks necessary to achieve goals? • Was the direction of the changes in these outcomes in line with the theory of change?
Impact Study	• Did participants have higher high school graduation rates, college enrollment rates, and college persistence rates than the matched sample of non-participating individuals?

Timing of Data Collection

Data collection was administered strategically to align as much as possible with key touchpoints already built into the GWBA program, and with consideration for seasonal or local events during the time of year. The timeline below (Exhibit 5) provides a visual overview of the data collected over the course of the evaluation for each cohort.

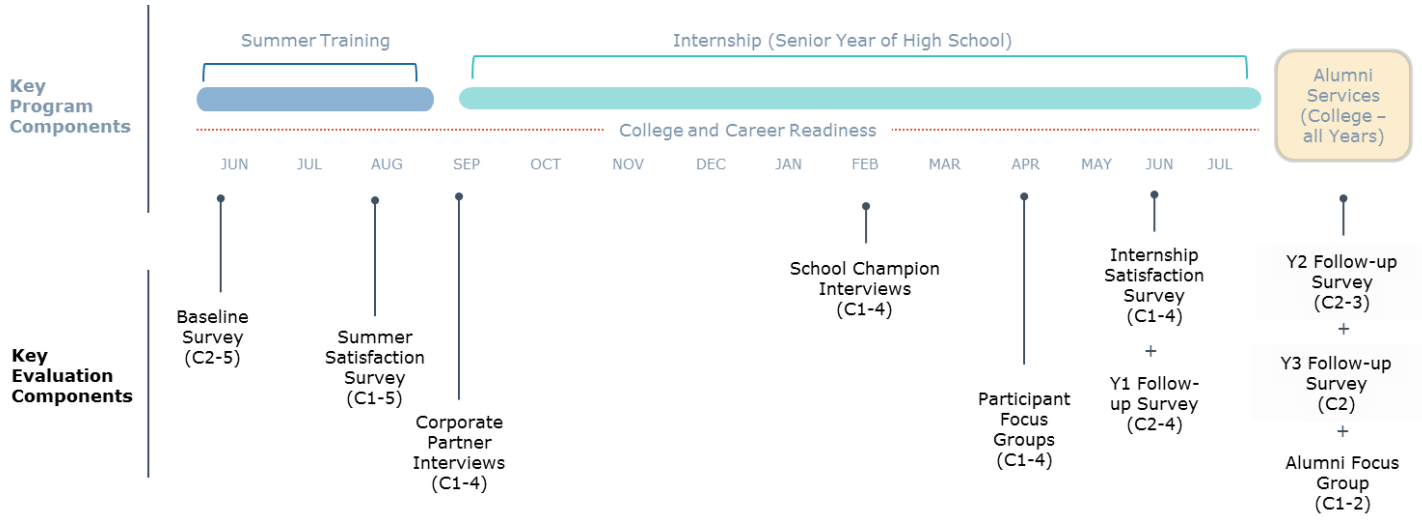
- For the **implementation study**, the summer satisfaction survey was collected for Cohorts 1-5 in August of each year; the internship satisfaction survey was collected for Cohorts 1-4 in June of each year; school

champion interviews, corporate partner interviews and participant focus groups were conducted for Cohorts 1-4; and one alumni focus group was conducted for Cohorts 1-2.

- For the **outcome study**, the baseline survey was conducted for Cohorts 2-5 in June. The annual follow-up survey was conducted each year for each cohort in the summer. Cohort 4 had one year of follow-up, Cohort 3 had two years of follow-up, and Cohort 2 had three years of follow up.

- For the **impact study**, district-level administrative data, including data on college enrollment from the National Student Clearinghouse, was collected for Cohorts 2-4.

Exhibit 5. Data Collection Timeline



Implementation Study

The purposes of the implementation study were to document GWBA's structure and outputs; determine the extent to which GWBA is serving the intended target population and implementing the program with fidelity to the model; and assess participants' satisfaction and overall program quality. The study also provided real-time feedback to GWBA staff on program implementation and service delivery to inform program adjustments throughout the early years of implementation that would increase the effectiveness and efficiency of the program. The primary methods included:

Review of program data. To gather information on program structure and outputs (such as number of student participants and number of internship placements), the evaluation team collected documents including program guides and curricula, application forms, and aggregate participation data from the GWBA Salesforce tracking system.

Key informant interviews. The evaluation team conducted interviews with GWBA staff, staff from participating high schools, and corporate internship supervisors to obtain a range of perspectives on the successes and challenges of program implementation, experiences with school and corporate partnerships, the value of the program to partners, and lessons learned. These semi-structured interviews were conducted annually by phone.

Focus groups with participants. Focus groups with student participants provided opportunities to gather in-depth qualitative perspectives directly from those served by the program regarding their experiences and satisfaction with different program components. The evaluation team facilitated two focus groups annually, each with 8-10 student participants[7].

Participant satisfaction surveys. To gather information on participants' satisfaction with each component of the program, the evaluators conducted two participant satisfaction surveys for each annual cohort, one in the last two weeks of the summer training program (Cohorts 1-5) and one in the last month of their internship (Cohorts 1-4). The survey instruments were based on an assessment of valid and reliable measures of student satisfaction, and were pilot tested to ensure the appropriateness of their use with the target population. The evaluation team worked with GWBA staff to administer the surveys with all student participants of each program component.

Outcome Study

The purpose of the outcome study was to assess how student participants' attitudes, skills, and behaviors/experiences changed over the course of the four years of the evaluation. This component provides an initial exploration into whether any changes over time occurred in the direction set out in the theory of change and logic model. Data were collected primarily through an annual in-depth survey (including an initial baseline survey) of GWBA participants. All members of Cohorts 2-5 were asked to complete the surveys over the course of the program only if they had initially consented to participate in the evaluation. The evaluators piloted the survey instrument with Cohort 1 (n=29), but did not include their responses in the analysis because the study began during their program year and therefore baseline responses from Cohort 1 could not be collected prior to program start.

For each cohort, a baseline survey was conducted on the first day of the summer training program with a follow-up survey conducted on an annual basis (one to three follow-up surveys depending on Cohort). To minimize attrition, the evaluators provided a modest monetary incentive for each survey completed, maintained a participant database with current contact information updated annually, and conducted outreach in collaboration with GWBA staff. In addition to the annual survey, qualitative data from focus groups and key informant interviews provided additional information and context on key outcomes as shown in Exhibit 6.

[7] GWBA staff supported the evaluation team in convening focus groups. In some cases, the entire cohort was invited to participate and then participants self-selected or volunteered to engage in the focus group, while in other cases focus group participants were selected by the evaluation team through a random sample, or a combination of both.

Exhibit 6. Outcomes and Measures for Students, Schools, and Corporate Partners

Outcome	Measure	Data Collection Method
Student Outcomes		
Development of occupational skills	• Problem-solving • Decision-making • Self-management	Baseline and follow-up surveys
Increase in critical life skills	• Grit scale • Self-management • Communication • Teamwork • Professionalism	Baseline and follow-up surveys
Increased educational aspirations	• Educational goals • Motivation to attend college • College and FAFSA application submissions • Level of support from parents/family to attend college	Baseline and follow-up surveys
Elevation of career aspirations	• Employment goals • Knowledge of educational requirements to achieve career goals • Level of motivation to achieve career goals • Employment in other professional jobs/internships • Number and quality of professional connections	Baseline and follow-up surveys
School Outcomes		
School leadership/ faculty recognize that GWBA contributes to college and career goals	• School staff perceptions	School champion interviews
Presence of GWBA students affects culture of larger school	• School staff and student perceptions	School champion interviews; student focus groups
Corporate Partner Outcomes		
Corporations value the services provided by GW interns	• Corporate partner perceptions	Corporate partner interviews
Presence of GWBA students affects culture of the corporation	• Corporate partner perceptions	Corporate partner interviews

Impact Study Design

The purpose of the impact study was to examine whether the program led to desired effects on high school graduation, entrance into post-secondary education, and post-secondary persistence. The study was developed to assess the program's impact on educational attainment for all individuals participating in the GWBA program.

Using school district administrative data, the evaluation team applied propensity score matching (PSM) to create two counterfactual comparison groups of similar,

but untreated students. Students were matched on data (e.g., demographics, test scores) from their junior year, prior to GWBA senior year activities. Two types of comparison groups were analyzed.

- One comparison group was comprised of high school juniors who did not attend schools served by GWBA but who attended schools with similar characteristics to those served by the program. These students were in the same graduating cohort as GWBA students (Group 1).

- The other comparison group was comprised of students who attended the same schools, but were seniors in the year prior to the Genesys Works program starting (Group 2).

Students were compared on a variety of factors including demographics, academic information, test scores, and other characteristics to determine equivalence prior to implementing PSM on individual students. Students who had similar characteristics as Genesys Works participants were then identified using the PSM approach.

The evaluation team estimated program impact by measuring the mean differences in outcomes between the treatment and comparison group, and looking at changes in distribution of outcomes. Depending on the type of variable, evaluators ran t-tests, chi-square tests, and ANOVA, as appropriate, to measure difference in the outcomes in the treatment and comparison groups. Outcomes included high school graduation rates, post-secondary school enrollment, and post-secondary school persistence. Outcome variables on post-secondary education were collected by the National Student Clearinghouse and matched back to high school students by individual school districts using de-identified coding mechanisms. More detail about our approach to PSM and statistical analysis is included in the Appendix C.

Strengths and Limitations of the Study

The primary strength of this design is the ability to create two comparison groups using de-identified administrative data from all high school students in the district. This eliminated the need for individual consent from students in the comparison groups. A limitation of this design was also related to the reliance on administrative data: the evaluation could not measure other key outcomes included in the follow-up surveys (e.g., educational and career aspirations, occupational skills and resources, entrance into the economic mainstream).

Mitigating bias. The design also included several features to improve comparability between the program cohorts and the comparison groups. By including two comparison groups, each of which was matched to the program participants through PSM, the research team mitigated bias due to a time lag (an issue for the comparison group of students in participating schools) and bias due to a potentially different student population or school environment (an issue for the comparison group of students in non-participating schools). To mitigate self-selection bias, both comparison groups only included eligible students who did not have access to the GWBA program.

Limitations to internal validity. Although the matching techniques and available school district administrative data allowed the evaluation team to identify closely matched comparison groups, a limitation to internal validity was that the matches could only be made on observable characteristics. This limitation affects the extent to which we can draw causal conclusions about the effects of the program on participants' outcomes. Students also possess unobservable characteristics that are important predictors of the outcomes of interest, such as motivation to attend college and pursue a professional degree. Given the significant time commitment

that Genesys Works requires, the treatment group was likely to be more motivated than the comparison groups to attend college and pursue a professional career.

External validity and generalizability. The impact study increased external validity of existing research by using a rigorous quasi-experimental design to measure the impact of the program for key outcomes—high school graduation, post-secondary enrollment, and post-secondary persistence—in a new geographic location. A similar quasi-experimental study was conducted on a Genesys Works program in Houston. A comparison of samples, intervention, and findings of the two studies together strengthens the generalizability of the effects of the Genesys Works model on high school students with shared characteristics across the studies.

Findings from the Implementation Study

The purposes of the implementation study were to document GWBA's structure and outputs; determine the extent to which GWBA is serving the intended target population and implementing the program with fidelity to the model; and assess participants' satisfaction and overall program quality. This component of the evaluation attempted to answer the following questions:

- Is GWBA implementing the program with fidelity to the program model and goals? What changes were made and why?
- Was the program able to reach the intended target population? Did it meet enrollment and retention goals?
- Were participants and key stakeholders satisfied with the program?
- What challenges did the program face in implementing the program and how were they addressed?

Exhibit 7 provides an overview of the major accomplishments of program implementation, including number of students, schools and internships/corporate partners that GWBA was able to recruit. GWBA also made changes to its services based on feedback from participants and data collected as part of the evaluation.

Exhibit 7. Summary of GWBA Program Implementation

Program Output	Direction of Change	Count	Description
Number of students served	+ Size of cohorts grew annually	486	The number of students who started the program grew from 29 in Cohort 1 to 162 in Cohort 5. A total of 486 students participated in the program.
Number of schools recruited	+ Number of participating schools increased from Cohort 1 to 5	29	The number of schools recruited increased from 5 in Cohort 1 to 29 in Cohort 5.
Number of internships created	+ Number of internships grew annually	350	The number of internships created increased from 19 in Cohort 1 to 110 internships in Cohort 5. A total of 350 internships were created.
Number of corporate partners recruited	+ Number of corporate partners increased from Cohort 1 to 5	32	The number of corporate partners recruited increased from 9 in Cohort 1 to 32 in Cohort 5.
Number of students completing the program	+ Number of program completions grew annually	330	Based on rates of program attrition, 381 participants completed the summer training program and 330 completed the subsequent internship.
Content and Sequence of Services	+ Services refined and expanded	N/A	GWBA refined its summer training and college readiness services; updated guidance to supervisors on how to meaningfully engage of interns; and created an alumni guidance and support program.

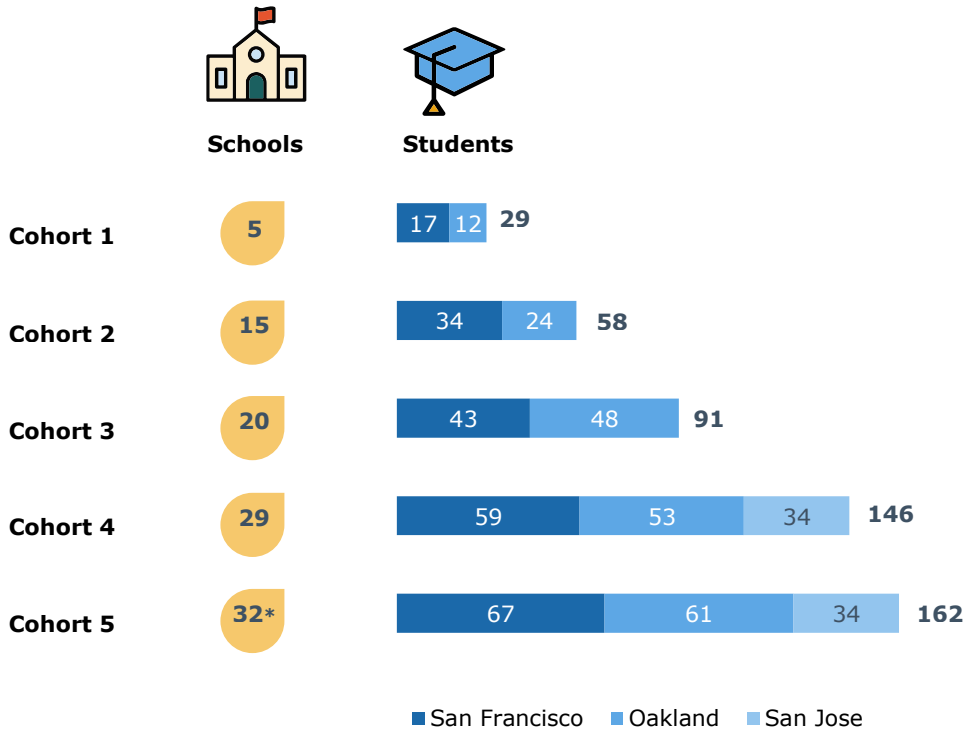
Program Recruitment and Enrollment

GWBA's plan was to scale up its program over five years, reaching a total of 700 low-income students who were first generation college students. More specifically, the program looked to recruit students who were motivated to attend college and pursue careers yet lacked knowledge about navigating the college application process and access to professional networks. This section provides details on GWBA's ability to recruit participants and deliver to them the essential components of its program: summer training, corporate internship, college and career services, and alumni support.

Students and Schools

Starting small in 2013 with 29 participants across five high schools in San Francisco and Oakland, the GWBA program rapidly scaled up by expanding to new schools in San Francisco, Oakland, and San Jose (Exhibit 8). By 2017, the program was working with 32 schools and 162 students. Over the first five years, GWBA has served a cumulative total of 486 students. While GWBA may not have reached its initial goal of reaching 700+ students, the program nonetheless scaled quite rapidly. GWBA staff continued to expand both the number of participating students and schools, while also balancing the time, investment, and resources necessary to support structures for students, specific program components, and overall program implementation.

Exhibit 8. Number of Schools and Students Recruited



*For Cohort 5, 32 partner schools were represented for those students who attended *registration day*; this number was reduced to 29 partner schools representing schools for students reaching the *internship* stage.

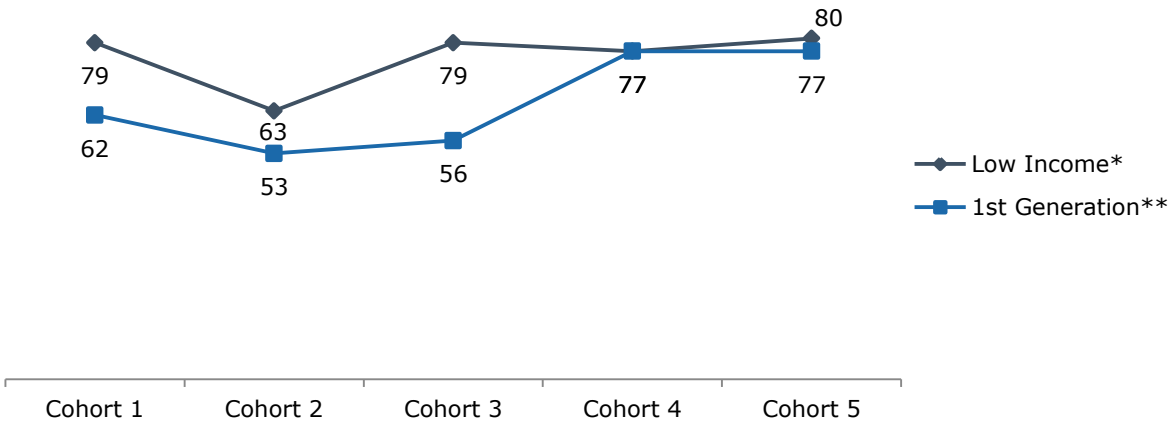
School champions and GWBA students interviewed over the course of the study attributed this success in expansion to (1) offering a unique and high-quality program that fills a gap in an environment saturated with nonprofits and community based organizations competing for students, (2) a growing buzz about the program as more students get involved with and spread the word, and (3) the steps GWBA took to strengthen its recruitment and communication processes with school partners, including creating a "job description" for school champions that helped clarify the roles and responsibilities of that position.

Despite this success, much of the increase in GWBA participation came from the program expanding to new schools rather than increasing the number of students in existing schools. Scaling up within schools was challenging for two main reasons: (1) many schools lack a large pool of students who meet the eligibility criteria and have the credits and GPA necessary to graduate while also participating in a part-time, year-long internship, and (2) schools often have inflexible course schedules that make it difficult to accommodate the schedules of a large number of GWBA students. Coordinating with a large number of schools, however, created logistical challenges and required more time for program staff to coordinate with teachers and counselors at each school. This constraint was one of the main reasons the program was not able to reach its enrollment goal.

Reaching the Target Population

As noted above, the Genesys Works program is designed to target primarily low-income, first generation college students, though it is not a requirement to participate in the program. Exhibit 9 illustrates that a large majority of the participating students in each cohort was low-income (defined by receiving free or reduced-price lunch). The program also reached a significant number of first generation students, comprising a majority of cohort participants across all cohorts, and up to 77 percent in Cohorts 4 and 5. GWBA adapted its practices over the course of the five year period to better reach these students by: (1) formalizing the definition of the target population and (2) implementing more focused criteria for targeting students during the outreach process.[8]

Exhibit 9. Percent of Students by Cohort (Demographics)

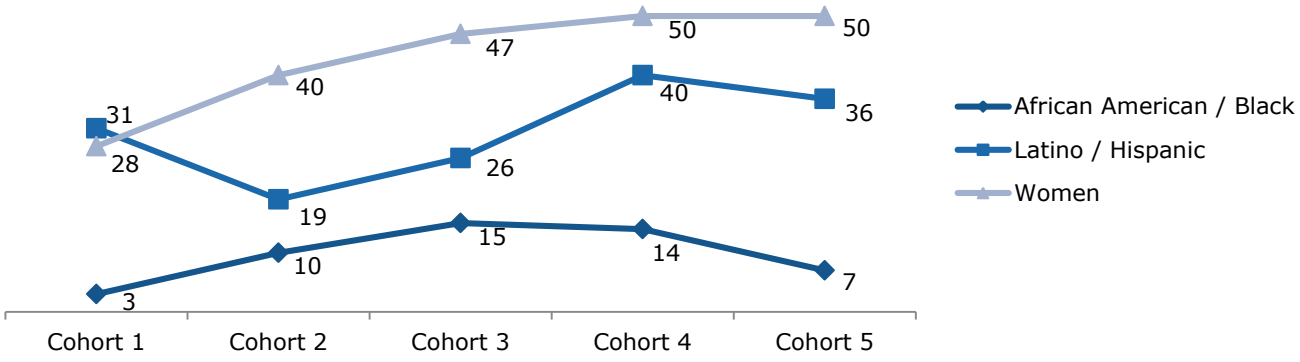


**Low-income refers to students receiving Free and Reduced Price Lunch*
***1st Generation refers to a first-generation college graduate (neither parent graduated any type of college) rather than a first-generation college student (neither parent attended from a 4-year college), both of which were asked.*

[8] More information about these changes is documented in the Year 2 and Year 3 evaluation reports.

Early in the program, baseline data showed that a much lower percentage of women, African American, and Latino students comprised the participant population. As a result, the program did targeted outreach to make sure it was reaching these students who are often underrepresented in postsecondary education and STEM fields.[9] As shown in Exhibit 10, these efforts were especially successful in recruiting more young women, representing half of all participants in the past two cohorts. The program has also increased the number of African American and Latino students since Cohort 1, though this increase is less pronounced and has fluctuated over time with a slight decrease between Cohorts 4 and 5 for both groups.

Exhibit 10. Percent of Students by Cohort (Demographics cont.)



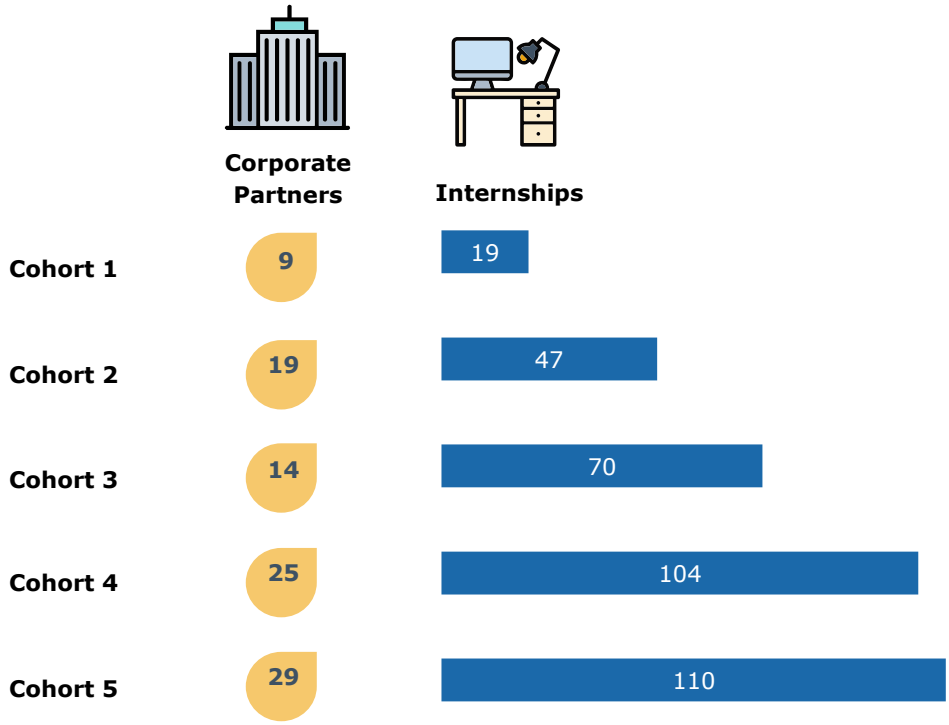
Internships and Corporate Partners

The part-time corporate internship during participants' senior year of high school is a critical component of the Genesys Works model because it gives participants a chance to practice and hone the skills learned in summer training. Exhibit 11 shows that as the GWBA program grew, the number of internship placements increased accordingly.

Despite the growth and success of the corporate internship component, finding additional corporate partners and meaningful internship slots emerged as a one of the biggest challenges to scaling up the GWBA program. Existing partners were enthusiastic about the program, but with the exception of three large companies (Salesforce, PG&E, and the City of San Francisco), they reported lacking the budget or supervisory bandwidth to expand beyond a handful of internship slots. In a few instances, all necessary internships were not secured until a month or two after the school year started.

[9] Huang, G. and Taddese, N. U.S. Department of Education. National Center for Education Statistics. Entry and Persistence of Women and Minorities in College Science and Engineering Education. NCES: Washington, DC. (2000). Retrieved from https://nces.ed.gov/pubs2000/2000601.pdf

Exhibit 11. Number of Corporate Partners and Internships by Cohort



Participation and Attrition

GWBA anticipated and planned for a certain amount of program attrition between the summer training and internship placement, knowing that not all students would be able to balance the demands of the program along with their academic and personal commitments. Once in the internship, however, the program helped students manage their school- and work-related responsibilities to minimize attrition from the internship. Program goals are as follow:

- **80 percent** of students who attend the first day of the summer training program will be placed in an internship.
- Of those who are placed in an internship, **90 percent** will complete the program, for an overall attrition rate of **72 percent.**

As shown in Exhibit 12, GWBA achieved—or came close to achieving—its retention goals for the summer training for every cohort with the exception of Cohort 1. The program exceeded its retention goals for the internship for every cohort except Cohort 3, where it came very close. Overall program retention fluctuated between 65 percent (Cohort 1 and 5) and 74 percent (Cohort 2).

Exhibit 12. Participant Retention Rates

Stage	Cohort 1		Cohort 2		Cohort 3		Cohort 4		Cohort 5		Total	
	#	Retention Rate	#	Retention Rate	#	Retention Rate	#	Retention Rate	#	Retention Rate	#	Retention Rate
Showed up to 1st day of summer program	29		58		91		146		162		486	
Completed the summer program	20	69%	48	83%	73	78%	114	79%	126	78%	381	78%
Placed in an internship	19		47		73		104		110		353	
Completed internship (Total program attrition rate in parentheses)	19	100% (65%)	43	91% (74%)	64	88% (70%)	98	94% (67%)	106	96% (65%)	330	93% (68%)

Satisfaction of Participants and Key Stakeholders

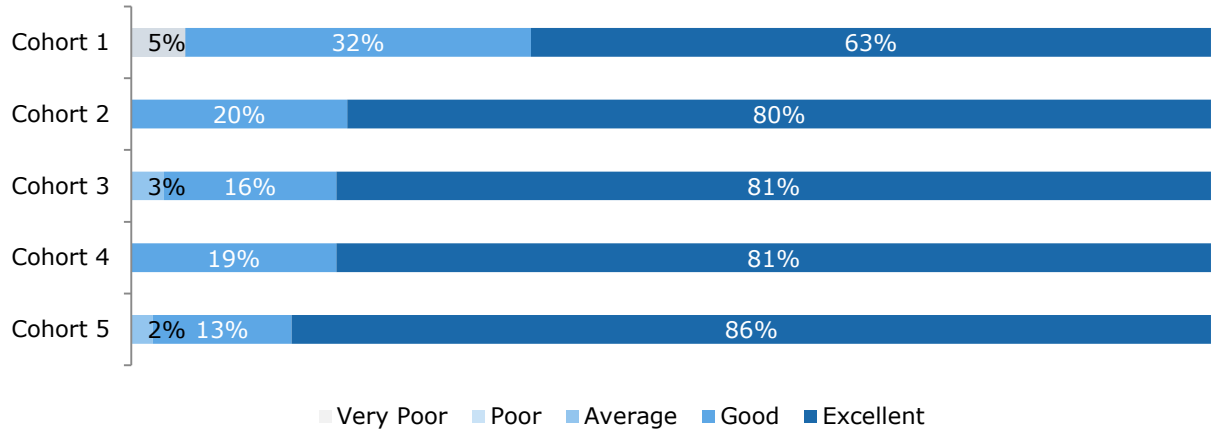
Tracking program satisfaction for participants, school champions, and corporate partners was done regularly over the course of the evaluation to help GWBA improve its services as it scaled up over time. The evaluation team tracked satisfaction through participant surveys, participant focus groups, and school champion and corporate partnership interviews. More detailed information about program satisfaction appears in earlier evaluation reports. Overall, however, key stakeholders—participants, school champions, and corporate partners—reported being very satisfied with the GWBA program, and made some suggestions for improvement that the program incorporated over time.

Participant Satisfaction

Participants reported learning valuable professional skills through their training and internship experience, gaining work experience in an environment with supportive colleagues and supervisors, and developing a network of peers with similar educational and career goals. Many participants spoke of valuing the "real world" work experience and described having collegial work environments and supportive and engaged supervisors. Participants reported learning to balance competing demands, be more independent, and have more confidence expressing their ideas. Many expressed pride about working for well-known corporations and earning money to support themselves and their family. In terms of challenges, participants spoke of struggling to balance the time commitments of a part-time job and their school work. This was particularly true for participants commuting longer distances.

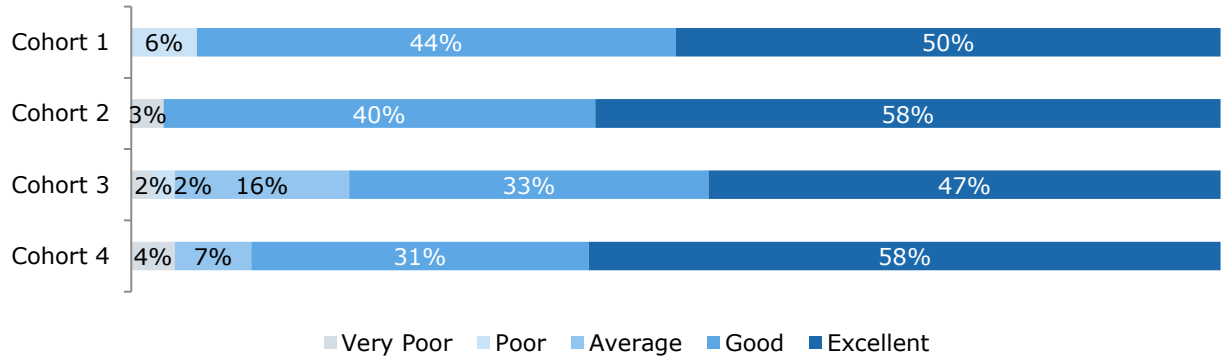
Survey findings show consistently high levels of satisfaction for all aspects of the program. As shown in Exhibit 13, the summer program consistently earned high levels of overall participant satisfaction, with improvements evident from Cohort 1 to Cohort 5. Among Cohorts 2-5, 80-86 percent of participants rated the program "excellent" and another 13-20 percent rated the program "good." GWBA staff have worked hard over the course of the five years to improve all components of the training, but particularly the technical components. While it was difficult to cover all the technical skills needed for every internship, the training was adapted to focus more on the basic technical skills (e.g. Excel) that corporate partners wanted participants to have.

Exhibit 13. Summer Training Satisfaction



Participants' satisfaction with the corporate internships was also high but generally not as strong as the satisfaction with summer training. While large majorities in each cohort rated the internships "good" or "excellent," the percentages of students providing "excellent" ratings were lower than in the summer trainings. Exhibit 14 shows that 47-58 percent rated the internship "excellent" and another 31-44 percent rated it "good." These numbers were lowest in Cohort 3, likely because recruiting corporate partners was particularly difficult that year, and many participants started their internship late as a result.

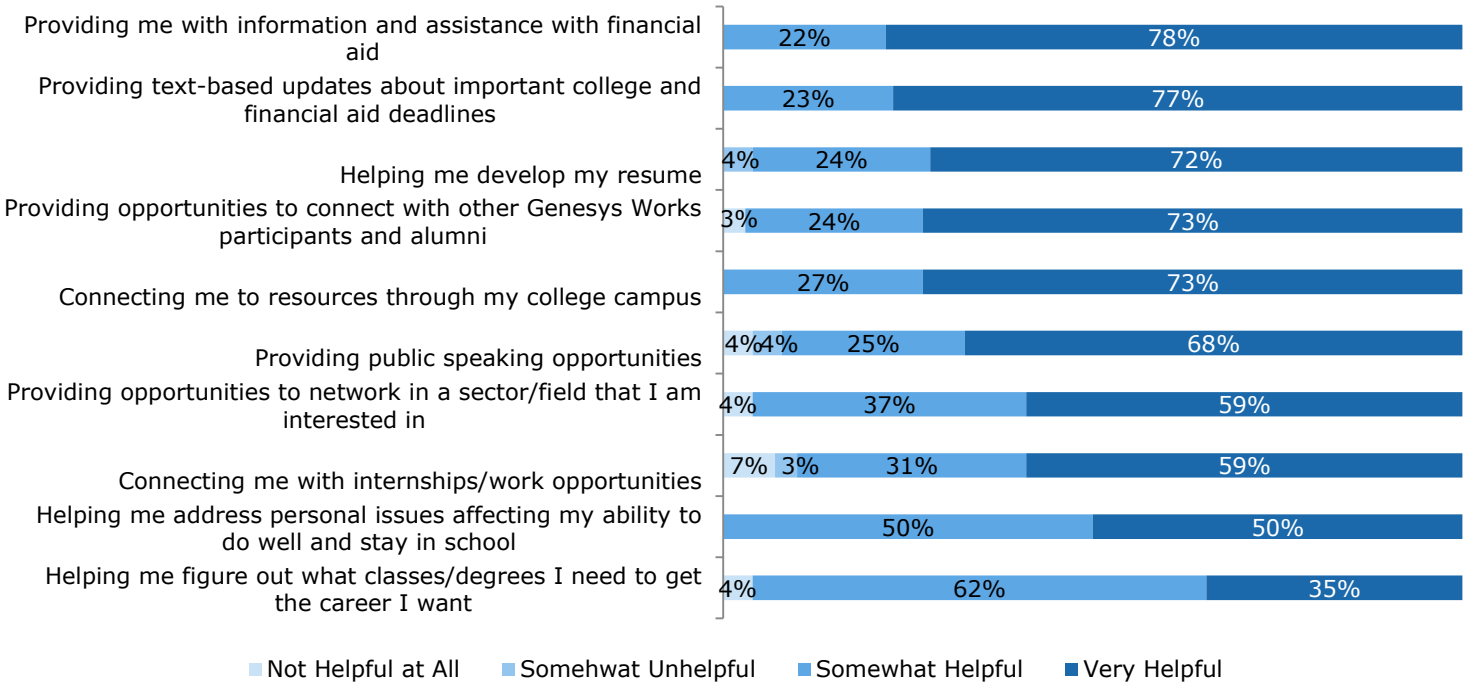
Exhibit 14. Corporate Internship Satisfaction



Alumni Satisfaction

Questions about alumni program satisfaction were added to the Year 2 and 3 follow-up surveys. Cohort 2 and 3 participants gave the alumni program high ratings. A large majority (81%) described their experience with the program as "excellent" (42%) or "good" (39%). Exhibit 15 shows which components of the alumni program participants found more or less helpful. Help with financial aid topped the list, which is consistent with the fact that alumni expressed concern about this issue. Fewer alumni found the program helpful in finding internship opportunities or dealing with more complex problems like "addressing personal issues affecting my ability to do well and stay in school" and "figure out what classes/degrees I need." This also makes sense given that fewer alumni were likely to seek out these types of support.

Exhibit 15. Satisfaction with Alumni Services



School and Corporate Partners

School partners universally recognized that GWBA has a robust program model that aligns with school district goals for promoting college and career readiness. They reported that the depth and rigor of the summer program, quality of the paid internships, and ongoing support provided by GWBA set it apart from other programs with similar goals.

Corporate partners reported that GWBA excelled in two major areas: (1) providing a high level of support and training to participants before internships start, and (2) creating a long-term internship that gives participants the opportunity to develop—personally and professionally—through in-depth experiences. Similar to school champions, corporate partners reported witnessing growth in interns' skills and level of confidence. Though not a universal experience, many reported added value to their company in terms of increased productivity and capacity.

Findings from the Outcome Study

The purpose of the outcomes study was to determine how student attitudes, experiences, and skills changed over the course of the program. Specifically, it was designed to answer the following questions:

- During the study period, what changes occurred among participants in terms of skill development, college and career aspirations, preparation for post-secondary enrollment, and resources and networks necessary to achieve goals?
- Was the direction of the changes in these outcomes in line with the theory of change?
- In what ways did the program affect the attitudes of school champions and corporate partners?

Data were collected primarily through an annual in-depth survey of GWBA participants to measure professional and post-secondary goals; levels of motivation and confidence to achieve these goals; levels of grit; knowledge about college and career options; support from family, friends and teachers; and occupational skills. The research team also conducted participant focus groups and interviews with school champions and corporate partners to get a deeper understanding of the changes they were seeing in student skills and school/corporate practices as a result of the program.

This chapter describes outcomes observed at the end of the first year of each participant's engagement with the program ("year-one outcomes") and at the end of their second and third years ("alumni outcomes").

First-Year Outcomes

The first-year follow-up survey was conducted at the end of the summer when students either had completed or were wrapping up their internships. Over the course of the evaluation, these surveys were conducted for Cohorts 2, 3 and 4 with response rates ranging from 59 to 73 percent. Students who completed this follow-up survey were much more likely to have completed the full program, so these findings primarily reflect the experiences of those who received the "full dose" of program services.[10] Our analysis of the results found small but statistically significant change across a number of key measures that were consistent with the theory of change program goals:

Participants showed increased confidence in the classroom. The biggest changes between baseline and follow-up were participants' confidence speaking in public and self-advocacy in the classroom. As shown in Exhibit 16, participants reported increased levels of confidence giving a speech or presentation and speaking up or expressing their opinion in class. Related to these increases in classroom confidence, students were more likely to report increased comfort reaching out to teachers and peers for support.

Year 1 Outcomes Analysis: Response Rate & Sample Size

Cohort 2
- Response rate: 73%
- # of surveys: 43

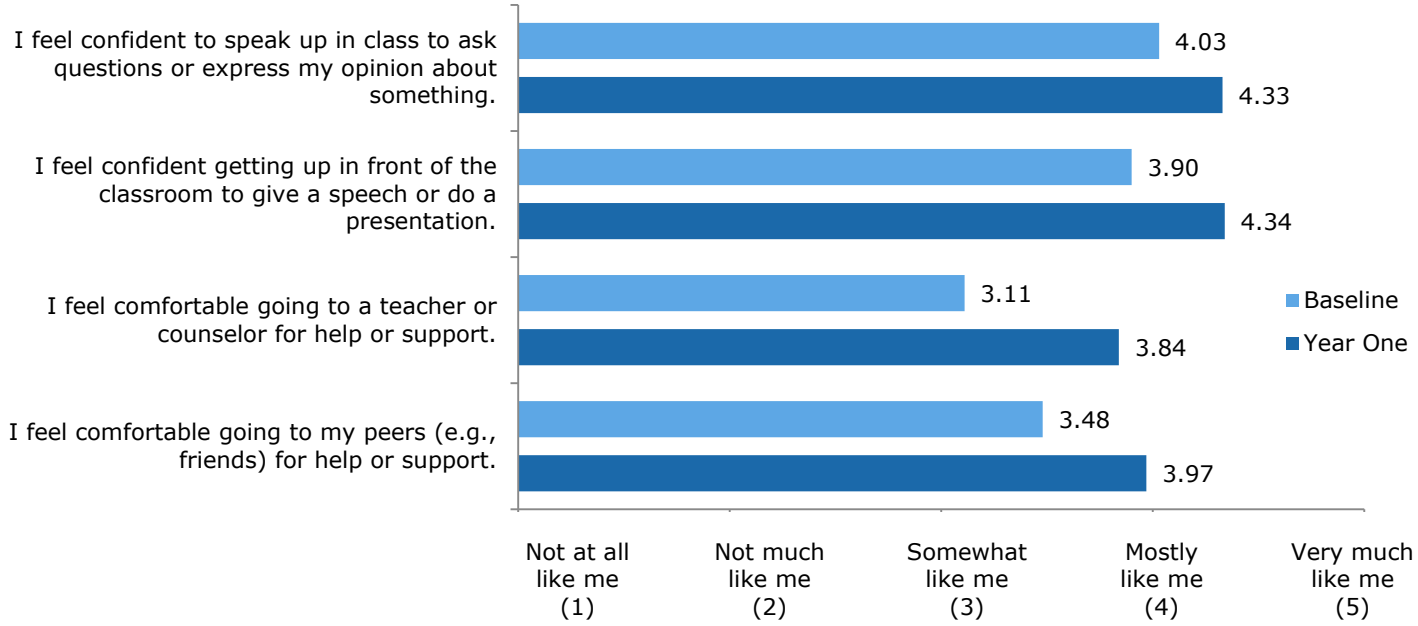
Cohort 3
- Response rate: 63%
- # of surveys: 59

Cohort 4
- Response rate: 59%
- # of surveys: 91

Sample Size: 194
Overall response rate: 64%

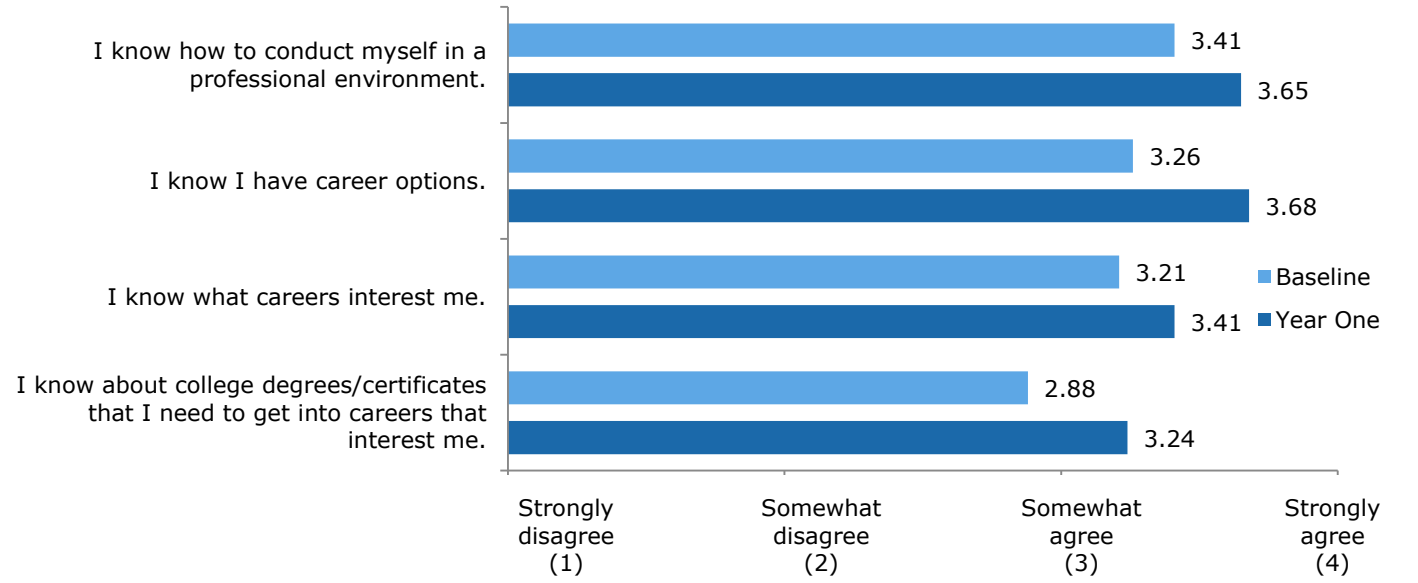
[10] More information about survey response rates and data analysis is provided in Appendix D.

Exhibit 16. Changes in Classroom/School Confidence



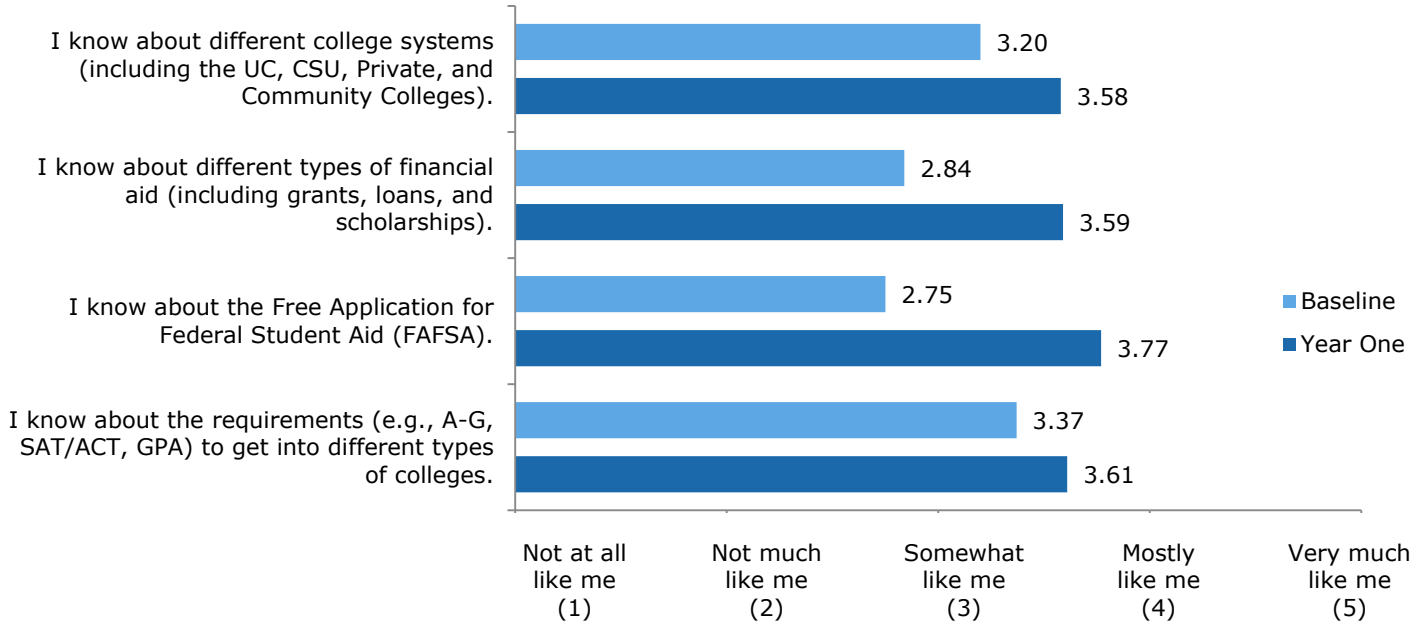
Participants were more comfortable in professional settings and feel more optimistic about their career options. As shown in Exhibit 17, participants reported growth in how comfortable and confident they feel in a professional environment. They also reported having more knowledge about their career options, what interests them, and what education they need to achieve their professional goals.

Exhibit 17. Changes in Levels of Professional/Career Confidence



Participants knew more about their postsecondary options. Also consistent with the theory of change, as shown in Exhibit 18, students reported greater knowledge about college systems and navigating the application process and financial aid requirements. Related to these findings, almost half of participants reported decreased anxiety about not having the financial resources necessary to attend college. The information and assistance that participants receive in the program to understand and apply for financial aid likely contributed to this change.

Exhibit 18. Changes in Knowledge about Postsecondary Opportunities



These findings were consistent with the types of changes that the school and corporate partners were seeing in the first year of the program. Teachers and counselors saw improvements in the classroom related to what they learned in the Genesys Works program, such as solving technology challenges or the ability to speak well in front of a group. Many also saw increased confidence and maturity and the ability to interact with adults. As one school partner described, "I think they have more confidence. They're expressive. They shake hands. They talk to people." Another appreciated how "students learn to advocate for themselves [and] know how to navigate the system a little bit easier," skills that are important for future college and career success.

In addition to building skills, school partners discussed the long-term benefit of exposing students to new and diverse experiences. One champion recognized that there are not many opportunities to expose students to the wealth of career options available to them. This champion stated, "Many of our students live in pretty isolated neighborhoods and communities. I think meeting different kinds of people and finding out about different kinds of jobs and people's histories and personal experiences is valuable—a kind of learning that you don't get at school." Another champion described how this unique exposure to a career setting has helped provide clarity to students about their future career interests. This champion said, "Having this internship experience is really opening the door to them in figuring out what they like and how to actually work in the professional field."

"Many of our students live in pretty isolated neighborhoods and communities. I think meeting different kinds of people and finding out about different kinds of jobs and peoples histories and personal experiences is valuable—a kind of learning that you don't get at school."

- School Partner

Similar to school partners, corporate partners and internship supervisors saw participant growth in their confidence and communication, teamwork, and initiative. Nearly all corporate partners talked about how much they have seen their interns' confidence grow. As their confidence increased, so did their ability to ask questions and effectively communicate with their supervisors and colleagues. Supervisors also noticed that interns were better integrated into teams, and they effectively interacted with colleagues in both professional and social contexts. As interns developed more confidence, partners noticed that students became more assertive and showed greater initiative to take on additional and more challenging tasks. As one partner stated, "In the beginning they're very shy. At the end of it all, they have grown so much confidence. They become masters at what they do and we actually have one person stick around to welcome the new group. They are so confident that they can provide training to the next group."

> "In the beginning they're very shy. At the end of it all, they have grown so much confidence. They become masters at what they do and we actually have one person stick around to welcome the new group. They are so confident that they can provide training to the next group."
>
> - Corporate Partner

Alumni Outcomes

The year-two follow up survey was conducted during the summer after participants' first year of college. Survey questions were similar to those asked at the end of their senior year in high school, with added information about the transition to college and participation in the GWBA Alumni Program. Of the 58 Cohort 2 participants who started the summer program in 2014, 34 of them responded to the alumni survey for an overall response rate of 59 percent. This includes 32 (68%) of the 47 that completed the full program and 2 (18%) of the 11 who left the program. Survey findings provided evidence that GWBA participants were staying in college and pursuing additional professional experiences:

- Alumni reported **slight decreases in academic and professional confidence** from Year 1, but the levels are still higher than at baseline.
- Alumni reported being ***less*** **concerned about being able to pay for college**.
- **Over half (59%) of alumni worked at some point during their first year of college, many in professional jobs.** Of those participants who worked, three-quarters (75%) were employed in corporate or professional settings and over half (55%) took a job that was in line with their career interests. Over one third (35%) took advantage of the GWBA alumni internship program.

Year 2 Outcomes Analysis: Response Rate & Sample Size

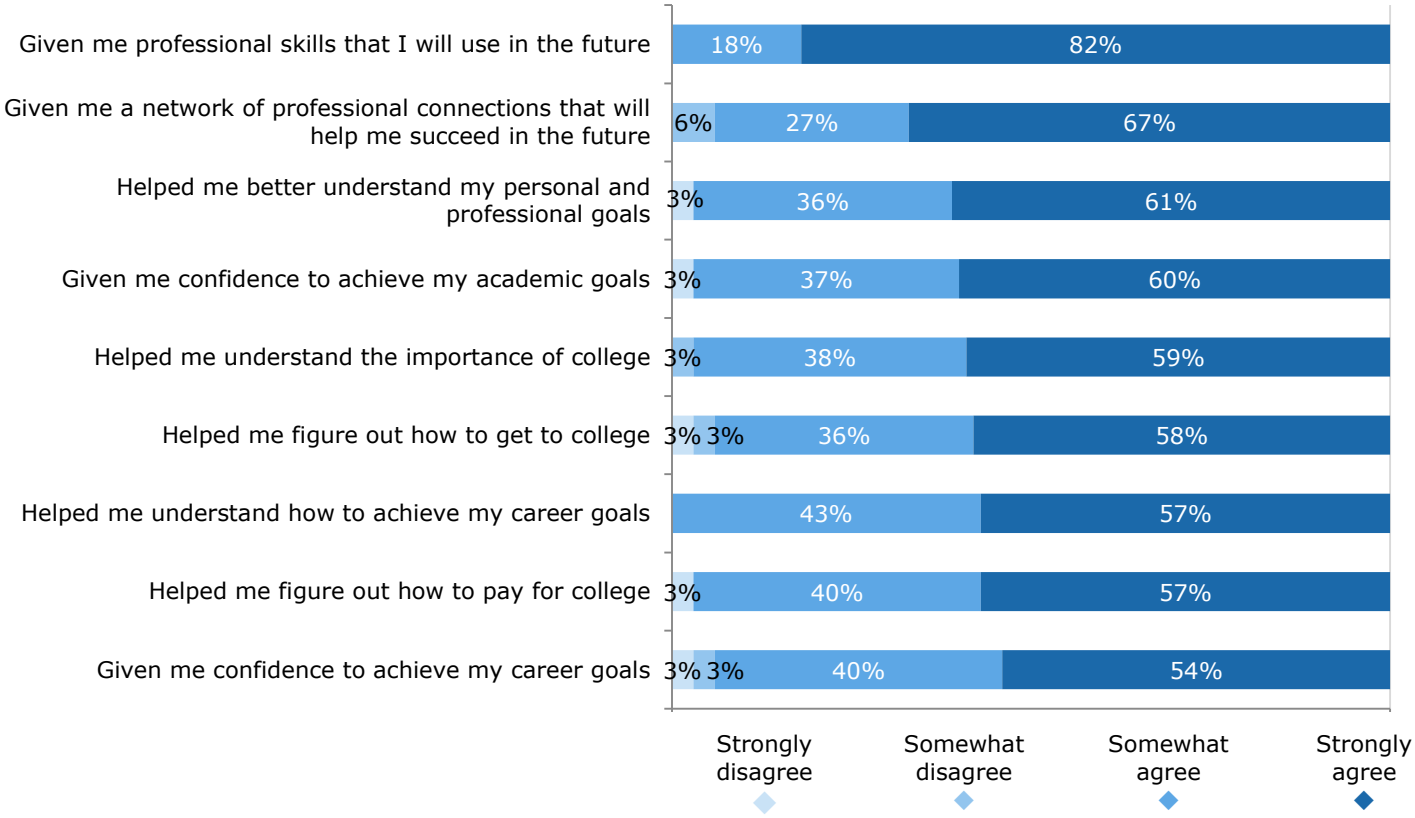
Cohort 2
- Response rate: 68%
- # of surveys: 32

Cohort 3
- Response rate: 18%
- # of surveys: 2

Sample Size: 34
Overall response rate: 59%

Finally, the survey asked participants about how the GWBA program overall has affected their college and career trajectory. As shown in Exhibit 19, participants thought the program helped them in many different ways, but felt that the professional skills and connections were the most valuable—82 percent strongly agreed that "GWBA has given me professional skills that I will use in the future," and 67 percent strongly agreed that "GWBA has given me a network of professional connections that will help me succeed in the future."

Exhibit 19. GWBA Program Value



Findings from the year-two survey were corroborated by a focus group we conducted with GWBA alumni in August 2016:

- **Alumni felt their GWBA experience helped them transition more easily into college.** Many students talked about how their GWBA experience taught them to be more self-reliant and responsible. For students balancing work and school, learning to balance these competing demands during their high school internship made it easier to do in college.

- **Their future educational and professional goals were more ambitious as a result of GWBA.** Students described having more direction and focus than their peers because of the GWBA program. Exposure to different careers during their internship gave them a better understanding of their options and motivated them to put in the work necessary to achieve their goals. It also raised their expectations and standards for personal performance in school and work. Students frequently talked about how their attitude and approach to school and work has changed because of the work ethic they developed in their internship.

- **The program reinforced the value of gaining a broad range of experiences and building social capital to create future opportunities.** Students were beginning to see and experience the

tangible benefits of being and staying involved in the GWBA program. They recognized their own personal growth, and for a couple students, their GWBA experiences led to promising jobs with reputable companies. Students were eager to continue to pursue different opportunities and meet new people to support their future success.

- **The program shifted their mindset to seek out and engage in opportunities for long-term, future benefit.** Many students talked about actively making decisions to forego short-term, immediate gratification (i.e., parties) in favor of finding opportunities that yield long-term, career benefits. As one student described, "After doing Genesys Works, I focus my attention and my time towards joining things that are going to benefit my future versus going to social events. I'm leaning more toward what is going to benefit me and my career versus what's fun right now in college. You have to have balance."

"Genesys Works is my foundation, my attitude...Having an internship in high school showed me what my future can be. I'm not wasting time or messing up. It was really important; Genesys Works influenced my attitude in life"

- Genesys Works alumnus

Findings from the Impact Study

The purpose of the impact study was to determine whether the program had a meaningful and statistically significant effect on participants' rate of **high school graduation**, **college enrollment**, and **college persistence**. To do this analysis, we used school district administrative data, including postsecondary data from the National Student Clearinghouse, and applied propensity score matching (PSM) techniques to create two comparison groups. These groups were designed to include students who most closely align with their GWBA counterparts but were "unexposed" to the GWBA program. The two groups account for bias based on time/academic year (Group 1) and location/school (Group 2):

- The first comparison group (Group 1) was comprised of students who were in the *same graduating cohort* as GWBA students and who attended schools with similar characteristics that were not served by the Genesys Works program.

- The second comparison group (Group 2) was comprised of students who attended the *same schools*, but were seniors in the year prior to the Genesys Works program starting.

We then estimated program impact by measuring the mean differences in the three key outcomes between the GWBA participants and the two comparison groups.[11] We also looked at subgroup differences based on site, gender, race/ethnicity, and English-language status. This chapter provides an overview of the findings and describes their meaning in the context of the study's strengths and limitations.

Impact Analysis

Exhibit 20 provides an overview of the findings for each of the two comparison groups across the three key outcomes. As the table illustrates, the following themes emerged:

- **GWBA had a positive impact on high school graduation rates.** In both Group 1 and Group 2, the analysis found similar and statistically significant impacts on high school graduation rates. For both groups, 99 percent of the GWBA students in the sample graduated from high school, compared with 84 percent of the comparison students in Group 1 and 89 percent of the comparison students in Group 2.

- **Both analyses show a positive impact on college enrollment and persistence, but the size and statistical significance varies considerably between the two comparison groups.** The impact analysis for Group 1 found larger and statistically significant impacts on both college enrollment and college persistence (26 and 16 percentage points, respectively) as compared with Group 2. Group 2 impacts were much smaller (3 and 5 percentage points, respectively) and were not statistically significant.

[11] More detail about the matching techniques and methods are included in the Appendix C.

Exhibit 20. Impact of GWBA on Key Outcomes

Stage	Group 1						Group 2					
	same year, different school						same school, different year					
	GWBA		Non-GWBA		Difference (p value)	Effect Size (interpretation)	GWBA		Non-GWBA		Difference (p value)	Effect Size (interpretation)
	n	%	n	%			n	%	n	%		
High School Graduation Rate	199	99%	169	84%	15%** (.00)	.55 intermediate	210	99%	206	89%	9%** (.00)	.40 small
College Enrollment Rate	220	75%	194	49%	26%** (.00)	.55 intermediate	225	78%	207	75%	3% (.41)	.08 none
College Persistence Rate	123	72%	112	56%	16%** (.00)	.34 small	125	78%	207	73%	5% (.34)	.10 none

*Statistically significant at the .05 level. (None at this level)
**Statistically significant at the .01 level.

In addition to statistical significance, which describes whether the observed differences (in this case, between the GWBA and non-GWBA students) are larger than what would be expected by chance alone, it is useful to also incorporate **effect sizes** into the assessment of program impact. Effect sizes, most commonly measured with Cohen's d,[12] describe the *strength* of the observed difference. In Exhibit 20, above, the impact of the GWBA program on high school graduation and college enrollment rates, when compared to the Group 1 comparison students, were found to have intermediate effects. The effect sizes for the other comparisons were lower.

In addition to Cohen's d, we also assessed effect size using odds ratios from logistic regression models, controlling for all variables used to create the PSM matches. Logistic regression models had to be run separately for the two districts, as PSM match variables were different by district. The effect of the GWBA program from the logistic models was as follows:

Oakland Unified School District

- High school graduation: large effect (OR = 24.1, p = .024)
- College enrollment: no effect (OR = 1.3, p = .559)
- College persistence: no effect (OR = 1.0, p = .940)

San Francisco Unified School District

- High school graduation: large effect (OR = 10.2, p = .031)
- College enrollment: no effect (OR = 1.4, p = .353)
- College persistence: large effect (OR = 5.9, p = .011)

Complete regression results are in Appendix C, Exhibits C8 – C11.

[12] Cohen's d: Cohen, J. (1988). Statistical power analysis for the behavioral sciences (2. Auflage). Hillsdale, NJ: Erlbaum.

The logistic regression results largely mirror the bivariate results, above. Because the logistic regression models controlled for all of the match variables, these findings provide evidence that the results were not a byproduct of the PSM not achieving complete balance between the GWBA and comparison groups (see Exhibits C6 and C7 in Appendix C for comparison of match variables before and after PSM).

Subgroup Analysis

As part of the impact analysis, the evaluation team looked at differences in program impact between important subgroups. Because of the smaller sizes of these samples, these analyses are considered "exploratory" but uncover some interesting trends to better understand which groups the program might be doing a better job serving and to inform questions for future research. These analyses were limited by the variables that were available and complete in the data provided by the school districts. The evaluation team looked at impacts by site, gender, race/ethnicity,[13] and language status. The following tables illustrate these differences, or lack thereof.

Exhibit 21. Program Impacts by Site

Stage	Group 1						Group 2					
	same year, different school						same school, different year					
	GWBA		Non-GWBA		Difference (p value)	Effect Size (interpretation)	GWBA		Non-GWBA		Difference (p value)	Effect Size (interpretation)
	n	%	n	%			n	%	n	%		
High School Graduation Rate												
Oakland	88	99%	69	87%	12%* (.02)	.37 small	105	97%	96	88%	9%** (.00)	.37 small
San Francisco	111	100%	81	82%	18%** (.00)	.69 intermediate	120	88%	111	90%	-2%** (.00)	.08 none
College Enrollment												
Oakland	88	78%	69	55%	23%** (.00)	.51 intermediate	105	82%	96	76%	6% (.31)	.14 none
San Francisco	132	72%	125	46%	26%** (.00)	.56 intermediate	120	75%	111	73%	2% (.72)	.05 none
College Persistence												
Oakland	49	71%	41	63%	8% (.41)	.17 small	60	75%	96	72%	2% (.77)	.05 none
San Francisco	74	73%	71	52%	21%** (.00)	.44 small	65	80%	111	72%	8% (.24)	.18 small

*Statistically significant at the .05 level.
**Statistically significant at the .01 level.

The subgroup analysis by site does not reveal a clear pattern of differences between sites. As shown in Exhibit 21, Group 1 shows stronger impacts for San

[13] The race/ethnicity subgroup analysis is not reported. Due to the large number of subgroups, no statistically significant impacts were found.

Francisco, while Group 2 shows the opposite (with the exception of college persistence). This reinforces our earlier findings from the implementation and outcome studies, which showed no large differences between neither the type of students being served nor the way the services are being delivered.

Exhibit 22. Program Impacts by Gender

Stage	Group 1						Group 2					
	same year, different school						same school, different year					
	GWBA		Non-GWBA		Difference (p value)	Effect Size (interpretation)	GWBA		Non-GWBA		Difference (p value)	Effect Size (interpretation)
	n	%	n	%			n	%	n	%		
High School Graduation Rate												
Women	99	99%	87	90%	9%** (.00)	.42 small	101	99%	94	89%	10%** (.00)	.43 small
Men	100	98%	81	79%	19%** (.00)	.65 intermediate	109	98%	112	89%	8.9%** (.01)	.37 small
College Enrollment												
Women	108	78%	98	54%	24%** (.00)	.52 intermediate	107	81%	95	84%	-3% (.58)	.08 none
Men	112	71%	97	43%	28%** (.00)	.59 intermediate	118	75%	113	66%	9% (.13)	.20 small
College Persistence												
Women	58	76%	55	62%	14% (.10)	.31 small	55	82%	95	82%	0% (.96)	.01 none
Men	65	69%	57	51%	18%* (.04)	.38 small	70	74%	113	65%	10% (.17)	.20 small

*Statistically significant at the .05 level.
**Statistically significant at the .01 level.

As shown in Exhibit 22, GWBA seems to be achieving stronger impacts for young men than it is for young women across all three outcomes and both groups, with the exception of high school graduation rates for Group 2. These findings are consistent with an earlier implementation finding — described in detail in the second annual evaluation report — that young women were more likely than young men to drop out of the program. Because of this finding, the evaluation team conducted an all-women focus group to learn more about the challenges that young women face being part of the GWBA program. As described in detail in the third annual evaluation report, participants in the focus group described having more family-related responsibilities that make it difficult for them to meet all of the GWBA-related commitments. Furthermore, because these tech sector companies had fewer women employees, they often felt less comfortable in their internships as compared with their young men counterparts.

Exhibit 23. Program Impacts by Language Status

Stage	Group 1						Group 2					
	same year, different school						same school, different year					
	GWBA		Non-GWBA		Difference (p value)	Effect Size (interpretation)	GWBA		Non-GWBA		Difference (p value)	Effect Size (interpretation)
	n	%	n	%			n	%	n	%		
High School Graduation Rate												
English Learner	53	96%	43	86%	10% (.07)	.37 small	55	96%	54	70%	26%** (.00)	.75 intermediate
English Fluent	146	99%	124	83%	16% (.00)**	.62 intermediate	155	99%	152	96%	3%* (.05)	.22 small
College Enrollment												
English Learner	54	80%	50	40%	40%** (.00)	.89 large	55	82%	53	53%	29%** (.00)	.65 intermediate
English Fluent	166	73%	140	54%	19%** (.00)	.41 small	170	77%	154	82%	-5% (.29)	.12 none
College Persistence												
English Learner	26	77%	25	56%	21% (.11)	.46 intermediate	27	82%	53	53%	29%** (.01)	.58 intermediate
English Fluent	97	71%	86	57%	14%* (.05)	.30 small	98	77%	153	80%	-3% (.55)	.08 none

*Statistically significant at the .05 level.
**Statistically significant at the .01 level.

Differences were more pronounced when looking at language status. As shown in Exhibit 23, impacts for college enrollment and persistence among English learners were much larger, and statistically significant, in both Groups 1 and 2. This finding is consistent with the focus of the program — i.e., assistance with college and financial aid applications and enrollment is likely to be of greater value to students who are new to the country or have language barriers that may make navigating these complex systems more difficult.

Discussion of Findings

As discussed in greater detail in Appendix C, the impact study has limitations that make interpreting these findings difficult. The quality and quantity of the district data made it difficult to create good comparison group matches and hence to adequately measure impact on key outcomes. This is particularly true for Group 2, since test scores were not consistent across school years. Furthermore, the Group 2 comparison students have a slightly longer follow-up period than the GWBA students, given that they are in an earlier graduating class.[14] This could be contributing to the smaller impacts observed for the Group 2 analyses.

Despite these limitations, there are a number of reasons to feel confident that the GWBA program is having a positive impact on high school graduation, college enrollment, and college persistence:

[14] Unfortunately, the data we received from school districts did not let us disaggregate college enrollment and persistence by school year to standardize follow-up periods.

- **The two comparison groups show similar patterns of positive impact across all three outcomes**. The difference between Group 1 and 2 for impact on high school graduation rates are similar. As would be expected, the impact for college enrollment and persistence is smaller for Group 2 because the follow-up period is longer for the comparison group. As such, Group 2 should be considered an *underestimate* of actual impact (e.g., if students in the GWBA group had the same amount of follow-up time, we would expect more of them to be enrolled and persist in college).

- **Findings from the subgroup analyses are in line with findings from the implementation and outcome study.** Findings of program attrition — highlighted in the Year 2 evaluation report — show young women leaving the program at higher rates than young men, which may explain why this analysis found that the program seems to have less impact on young women than on young men. Findings from participant focus groups and staff interviews also provide qualitative evidence that the program is especially effective for students who have less knowledge of the college and financial aid application process, as would be consistent with students for whom English is a second language.

- **These findings are consistent with a similar study of GWBA impact in Houston.** This study, which also had a quasi-experimental design using PSM techniques, increases the external validity of our evaluation by demonstrating similar results in a different GW site.[15]

As the GWBA program scales up further, staff may want to consider a future study with a larger sample of students and a longer follow up period, ideally with more complete and consistent data from administrative or other sources.

[15] Branch, G. and Mehrotra, N. Impact of Genesys Works on Participating High School Students in Houston. (April, 2012). *Texas Schools Project. The University of Texas at Dallas.* Retrieved from http://docplayer.net/14434285-Impact-of-genesys-works-on-participating-high-school-students-in-houston-prepared-for-genesys-works.html; Note: Findings are most consistent with Group 1 for impact on high school graduation (9%), college enrollment (21%) and college persistence (18%).

Summary and Implications for Further Research

All in all, the evaluation of the GWBA program has demonstrated positive results:

- The GWBA program was able to scale up considerably from 29 participants and five schools in the first year to 162 participants and 32 schools in the fifth year. Across the five years as a whole, the program met its program retention goals for the summer training and internship.

- Improvements in recruitment strategies led to better targeting of low-income and first generation students along with demographic groups over the five cohorts (e.g., women, African-Americans, and Latinos) who are largely underrepresented in IT/STEM professions.

- GWBA made continuous improvements throughout the first five years of program implementation in response to stakeholder feedback. Participants, school champions, and corporate partners were largely satisfied with the program.

- Short-term participant outcomes, including academic and professional skills and confidence, were in line with the program's logic model and theory of change.

- The program demonstrated statistically significant, positive impacts on all three key outcomes: high school graduation, college enrollment, and college persistence.

While past evaluation reports provided detailed recommendations for program improvement, additional findings from the impact analysis suggest that a greater focus on improving the experiences of young women in the program may be warranted. For example, program coordinators could help participants address and balance family-related conflicts and work with supervisors to make internships more welcoming to young women in male-dominated workplaces.

In the future, GWBA may want to consider additional research to strengthen and add to the findings of this evaluation. A study with a similar quasi-experimental design could be conducted with a larger sample size and longer follow-up period. Accessing employment records for students once they graduate from college would provide evidence about whether the program is achieving long-term impacts on entry into professional jobs and higher earning. GWBA may want to also consider a randomized control trial (RCT) if the demand for the program exceeds the number of available student slots. Periodic surveys could be conducted with a control group of "wait list" students, which would provide a more accurate measure of impact on short-term outcomes as well as long-term success.

Appendix A

Genesys Works Logic Model

Genesys Works Logic Model 12/12/13

Problem: Students growing up in low income families are more likely to end up in underemployed or in jobs that fail to actualize their true potential

Program Theory	Target Population	Program Strategies	Short-term Outcomes	Medium-term Outcomes	Long-term Outcomes
Through the GW program, participants will gain: (1) technical knowledge/skills, (2) critical life skills, like communication, teamwork, professionalism, and determination/grit, and (3) meaningful relationships with adults and fellow peers who will provide individualized instruction, coaching and guidance. By succeeding in a professional environment, participants will develop a greater sense of self-efficacy, recognize that a new economic reality, and a long-term professional career, is possible. With this new vision, participants will use the resources they have gained from the program to put themselves on the path to a professional, upwardly mobile career, by completing high school and enrolling in post-secondary education that will help them achieve their goals. GW participants complete post-secondary education and obtain professional employment with the potential for career advancement.	***Students:*** • Are economically underprivileged • Are academically in the 50th – 90th percentile • Are legally able to work in the United States • Are able to work half days (15-20 hours a week) during their senior year • Demonstrate commitment and ability to succeed in our program • Enter the program in the summer after 11th Grade. ***Schools:*** School partners are selected that serve a large proportion of students that meet the target criteria and have school leaders that are excited about providing opportunities to underprivileged students who wish to improve and expand their career options. ***Corporations:*** Corporate partners are selected who see the double bottom line of the program; have the size, resources, and culture to provide a professional and meaningful work environment; are located in reasonable proximity to public transportation.	***Students:*** • Summer Training: 8-week, intensive summer program between junior and senior year. Training includes hard and soft skills, as well as talking with business professionals; mock interviews; team bldg. activities; testing/ assessments. • Year-long, "meaningful," paid professional internships: 15-20 hrs per week during senior year; $11/hr • Full-time GW program coordinators act as mentor/coach: 1 for roughly every 20 students. Throughout program provide career and college guidance (linking career goals with necessary educational path), assistance on how to apply to college, financial aid, etc. • During the internship, the interns meet one evening per week as a group for Peer-to-Peer network activities designed to help participants meet their educational and career goals. ***School:*** • Schools and "school champion" selected to identify and assist in recruiting students ***Corporations:*** • Worksite supervisors receive training and support from GW program coordinators. • Regular formal performance review of GW intern by worksite supervisor and program coordinator.	***Students:*** • Development of occupational skills with value in the labor market • Increased critical life skills: communication, teamwork, professionalism, grit/determination • Increased career and educational aspirations • Preparation for post-secondary enrollment (submitting applications and financial aid) • Development of professional networks through the internship that will help with long-term professional goals (i.e. serve as a reference on a college application or help secure a future internship). ***Schools:*** • Partnerships with 5 schools in San Francisco and Oakland by Year 1; 10 by Year 2 ***Corporations:*** • Establish 26 corporate internships in Year 1, and 51 in Year 2.	***Students:*** • Graduation from high school • Post-secondary enrollment • Persistence in post-secondary education ***Schools:*** • Increase in proportion of students being served in participating schools/school districts • Partnerships with 5 schools in South Bay Peninsula by Year 3; 10 by Year 4 • Increased recognition by school leadership/faculty that internships and other GW programming contributes to the goal of graduating "college and/or workforce ready" students with 21st Century skills. ***Corporations:*** • Retention of existing corporate partners and increased number of internships provided by existing corporate partners. • Increase in the number of corporate partners participating in GW. • Corporations value the services provided by GW students who serve as interns—both in terms of improving their own bottom line as well as contributing to the education and workforce development of future professionals.	***Students:*** • Successful completion of post-secondary program (with a degree or professional certification) • Entrance into professional careers that pay well and have career advancement opportunities ***Schools:*** The culture of urban public schools is one where the pursuit of a professional career is the norm for all students. ***Corporations:*** Corporations support efforts to enhance K-12 education and become permanent partners in planning and operating programs to serve economically underprivileged youth ***Other Long-term Outcomes:*** • Family/community impacts, i.e., gains made by GW participant have positive impacts on families and community. • Expansion/scaling of GW model changes the conversation about the value of professional work-experience programs for high school students (i.e. school system policies change to make this option more academically feasible for students)

Appendix B

Research Questions and Data Collection Methods

Phase	#	Research Questions	Methods										Reference
			Interviews			Focus Groups	Satisfaction Surveys		Outcome Surveys		Program Data	PSM	
			Corporate Partner	School Champion	GWBA Staff	Participant	Summer	Internship	Baseline	Follow-up	GWBA Data	District Data	Report page # / Notes
Implementation Study	**1.0**	**Is the program being implemented with fidelity to the program model?**											pp 17-24; Covered greater depth in Year 1 and 2 evaluation reports
	1.1	Is the program able to recruit and enroll the intended target population?		x	x						**x**		pp19-20
	1.2	Is the program able to reach its targets in terms of the number of schools and participants over the course of the grant?			x						**x**		pp18-19
	1.3	Is the summer training program implemented as intended? Is it providing the proper preparation for a professional internship? How does it differ, if at all, from what is offered at other Genesys Works sites?	**x**		**x**	**x**	**x**						Year 1 and 2 evaluation reports
	1.4	What type of internships is Genesys Works securing for participants? Are the internships providing a meaningful professional experience? Are participants receiving mentorship and developing networks that will help them with a long-term professional career?	**x**		x	**x**		**x**			**x**		Year 1 and 2 evaluation reports
	1.5	Are participants satisfied with their experience in Genesys Works? What components do they think are most valuable? What would they change about the program or their experience, if anything?				**x**	**x**	**x**		**x**			pp22-24; Covered in greater depth in Year 1 and 2 evaluation reports
	2.0	**What are the challenges of program implementation? How do program staff address these challenges? What can this teach us about future efforts to replicate and scale the program in new communities?**	**x**	**x**	**x**	**x**							pp17-24; Covered in greater depth in Year 1 and 2 evaluation reports
	3.0	**What are the patterns of participation and attrition in the program?**							x		**x**		pp21-22; Covered in greater depth in Year 1-3 reports
	3.1	Of those who apply, how many are invited for an interview? What proportion show up for the interview?									**x**		Covered in Year 2 evaluation report
	3.2	Of those who complete an interview, how may are accepted?									**x**		Covered in Year 2 evaluation report
	3.3	Of those accepted how many show up on the first day?									**x**		Covered in Year 2 evaluation report
	3.4	What is the rate of attrition during the summer training program?									**x**		pp21-22
	3.5	How many participants move on to internships? What is the attrition rate during the period of the internship?									**x**		pp21-22

Phase	#	Research Questions	Methods										Reference
			Interviews			Focus Groups	Satisfaction Surveys		Outcome Surveys		Program Data	PSM	
			Corporate Partner	School Champion	GWBA Staff	Participant	Summer	Internship	Baseline	Follow-up	GWBA Data	District Data	Report page # / Notes
Implementation Study, cont.	**4.0**	**Has GWBA increased its influence on schools and corporate partners over the course of the grant?**	**x**	**x**	x								Year 3 evaluation report
	4.1	In what ways, if at all, do GWBA participants influence the larger school culture?		**x**		x							Year 3 evaluation report
	4.2	How has participation in the GWBA program affected the attitudes of school administrators, teachers, and corporate partners?	**x**	**x**	x								Year 3 evaluation report
	5.0	**What similar programs and services, if any, are available to students at participating high schools? To what extent are students similar to GWBA participants accessing these programs? Are GWBA participants accessing these same programs?**		**x**	x								**Question not answered. The large number of participating schools was not anticipated at the start of the program. Gathering information from 29 separate schools was not feasible given the scope of the evaluation.
Outcome Study	**6.0**	**During the study period, what changes have occurred among participants in terms of**											pp25-30; Earlier findings included in Year 2 and 3 evaluation reports
	6.1	Occupational skills development;	x	x		x			**x**	**x**			pp25-30
	6.2	Increased life skills, including communication, teamwork, professionalism, and grit/determination;	x	x		x			**x**	**x**			pp25-30
	6.3	Increased career and educational aspirations;	x	x		x			**x**	**x**			pp25-30
	6.4	Preparation for post-secondary enrollment;	x	x		x			**x**	**x**			pp25-30
	6.5	Development of professional networks;	x	x		x			**x**	**x**			pp25-30
	6.6	Resources available to achieve goals; and	x	x		x			**x**	**x**			pp25-30
	6.7	Entrance into professional employment?	x	x		x			**x**	**x**			pp25-30
	7.0	**EXPLORATORY: How do these outcomes vary by demographics, school, and type of internship?**							**x**	**x**			Explored - no statistically significant differences found
	8.0	**Is the direction of the changes in these key outcomes in line with the program theory and logic model?**							**x**	**x**			pp25-30

Phase	#	Research Questions	Methods										Reference
			Interviews			Focus Groups	Satisfaction Surveys		Outcome Surveys		Program Data	PSM	
			Corporate Partner	School Champion	GWBA Staff	Participant	Summer	Internship	Baseline	Follow-up	GWBA Data	District Data	Report page # / Notes
Impact Study	**9.0**	**Do participants have higher high school graduation rates than the matched sample of non-participating individuals?**										x	pp31-32
	10.0	**Do participants have higher rates of post-secondary enrollment than the matched sample of non-participating individuals?**										x	pp31-32
	11.0	**How has participation in the GWBA program affected the attitudes of school administrators, teachers, and corporate partners?**	x	x									pp31-32
	12.0	**EXPLORATORY: Do the program impacts on the key outcomes listed above vary by:**										x	pp32-35
	12.1	Levels of program participation/completion,										x	Not possible to track because we were only able to use de-identified district data and could not match to survey data
	12.2	Participant demographics,										x	pp32-35
	12.3	High school attendance rates, or										x	Not possible because of data quality issues with district data
	12.4	Academic achievement/GPA?										x	

Appendix C

Propensity Score Matching and Impact Analysis

Propensity score matching (PSM) is an analytic method to adjust for nonrandom selection into a treatment or program so that program outcomes can be more equally compared. In this case, entry into the GWBA program was not randomly assigned, but rather students self-selected to apply for the program and GWBA staff used a set of criteria to select participants. This complicates the evaluation that is seeking to assess the impact of the program, because the characteristics that led students to apply to the GWBA program (e.g., motivation to succeed) and the criteria that GWBA staff used to select participates (e.g., GPA) could also, in themselves, be associated with better outcomes. Ideally, we would like to select a "comparison group" of students who are as similar as possible to those who participate in GWBA. PSM provides a mathematical way to approximate this.

The logic behind PSM is to "balance" the two groups by creating a score. A propensity score is a combination of each individual's observed characteristics. The comparison group is then selected of the non-GWBA students who most closely match the GWBA students, based on having a similar propensity score.

This appendix describes the data and methods used for the Impact Study portion of the GWBA evaluation.

Data

Source

Data for the Impact Study came from Oakland and San Francisco Unified School Districts. They provided de-identified academic information, test scores, and demographic characteristics for all students' Junior and Senior high school years, with a flag for those who participated in the GWBA program. College enrollment and persistence data – matched by the districts to their administrative data – came from the National Student Clearinghouse (www.studentclearinghouse.org). To align with the years GWBA began in these districts, districts provided data for six academic years, between 2011-12 and 2016-17.

Two Comparison Groups

Finding comparison students who most closely align with their GWBA counterparts but were "unexposed" to the opportunity to participate in GWBA was confounded by elements of time/academic year (Group 1) and location/school (Group 2). We, therefore, selected two comparison groups to account for each:

- Group 1: Same Year, Different School
- Group 2: Same School, Different Year

Group 1: Same Year, Different School. For the first comparison group, GWBA matches were selected from among students who were high school juniors in the same academic year and attended a non-GWBA in the same district. Students were

matched by data from their junior year because that is the year they joined GWBA and matching is intended to select a comparison group equally likely to join GWBA. Academic years aligned with GWBA cohorts were as follows:

- GWBA cohort 2: Junior Year 2013-14
- GWBA cohort 3: Junior Year 2014-15
- GWBA cohort 4: Junior Year 2015-16

Group 2: Same School, Different Year. GWBA did not recruit students from across the district, but rather focused on specific schools, which could be different from schools without a GWBA presence. A second comparison group, therefore, was selected that sought matches from the same school. GWBA matches were selected from among students who attended what later became a GWBA high school and were juniors in the two years prior to GWBA participation.

For both comparison groups, we excluded students from alternative or missing high schools since much of the academic information is unavailable for these locations.

Matching

Variables

Since the ideal comparison group is students who *would have* participated in GWBA had the program been available to them, the ideal variables on which to match are those most associated with describing who did and did not self-select into the program, such as the following:

- Knowing about the program (e.g., school, teachers, knowing previous participant, connection to what's going on in the school, attendance)
- Finding the program appealing (e.g., interest in IT or business, wanting internship, ambitiousness, friends' participation, English skills)
- Being eligible to apply (e.g., on track to graduate, no after school activities, flexible schedule, ability to legally work, parent approval)
- Completing the application (e.g., motivation, time)
- Being selected (e.g., explicit criteria, number of other applicants, ability to get to the interview, performance on the interview)

However, we were limited by the information that was available through school district administrative data – i.e., academic information, test scores, and demographics. We, therefore, matched on variables that we hypothesized could be correlated with GWBA participation and/or outcomes that were available for the 2013, 2014, or 2015 school years (Exhibit C1).

Because of the changes in standardized tests over time, each academic year had a different set of matching variables for the *same school* sample. Because of the differences in available data and standardized tests between districts, each district had a different set of matching variables for both the *same school* and *same year* samples.

Exhibit C1. Variables Used for Propensity Score Matching, by School District and Junior Academic Year

	Oakland Unified School District			San Francisco Unified School District		
	2013	2014	2015	2013	2014	2015
Academic Information						
Grade Point Average	x	x	x	X	x	x
Attendance	x	x	x	x	x	x
Special Education Status	x		x	x	x	x
Schools' Proportion of Students Eligible for Free or Reduced Priced Lunch	x	x	x	x	x	x
Test Scores						
CAHSEE ELA SS	x	x				
CAHSEE Math SS	x	x				
SBAC ELA Literacy Scale Score		x	x			
SBAC Mathematics Scale Score		x	x			
CAASPP English Language Arts Score					x	x
CSELA English Language Arts Score				x		
CSMath Math Score				x		
CST Science Placement Level						x
CSSci Science Score				x		x
CSWh World History Score				x		
Demographics						
Race / Ethnicity	x	x	x	x	x	x
English Fluency	x	x	x	x	x	x
Gender	x	x	x	x	x	x
Parent's Education Level				x	x	x

Methods

Propensity score matching was conducted using the PSM in SPSS module, using an R plug-in,[16] with a logistic regression estimation algorithm. The matching algorithm was nearest neighbor, i.e., GWBA people are sorted by their estimated propensity score and matched sequentially to someone in the comparison group who has the closest propensity score, i.e., is the nearest neighbor of this person.

Since we had limited variables on which to match, all PSM settings were selected to **maximize the strength of matches**, i.e., to select a comparison group with propensity scores as close to those of the GWBA group as possible:

[16] Thoemmes, F. (2012). Propensity score matching in SPSS. Retrieved from http://arxiv.org/abs/1201.6385

- Caliper = 0.2. This is the maximum allowable difference between matched participants. So, if the person with the closest propensity score has a score that differs by more than 0.2, the match is not made.
- 1:1 match. One comparison person was selected for each GWBA person, so that the single person with the closest propensity score was selected.
- With replacement. A comparison person could be matched to more than one GWBA person, again, so that the single person with the closest propensity score was selected.

PSM Diagnostics

Exhibit C2 summarizes the number of people in the GWBA and potential comparison group who were and were not able to be matched, based on the criteria used, above. In general, most GWBA participants were able to find a match. These proportions ranged from 55% of the *same year* Oakland 2013-14 sample to 100% of the San Francisco Same Year 2014-15 and Oakland *same school* samples.

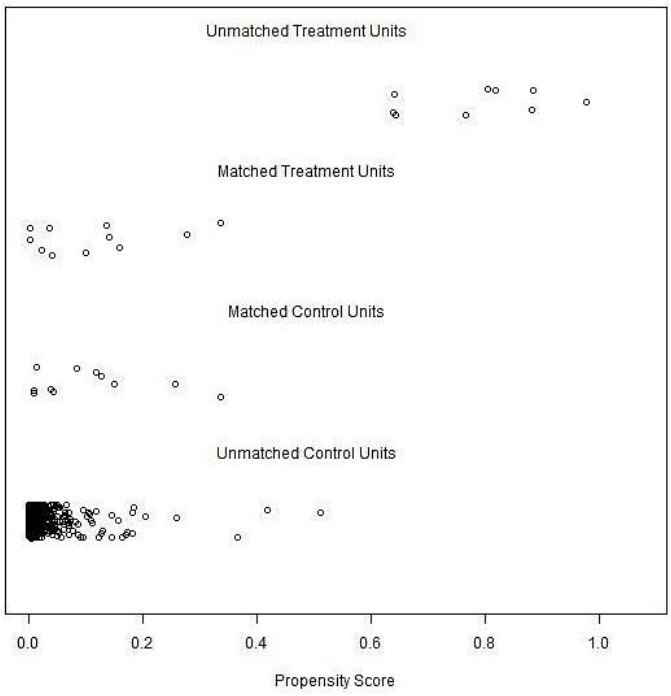
Exhibit C2. Sample Sizes Before and After Propensity Score Matching

	Junior Academic Year	Total	GWBA		Comparison	
			Matched	Unmatched	Matched	Unmatched
Group 1: Same Year						
Oakland	**2013-14**	570	11	9	11	539
	2014-15	516	38	2	30	446
	2015-16	494	39	6	28	421
San Francisco	**2013-14**	2,361	34	1	32	2,294
	2014-15	1,283	40	0	39	1,204
	2015-16	1,038	58	1	54	925
Group 2: Same School						
Oakland		3,289	105	0	96	3,088
San Francisco		6,981	120	15	111	6,735

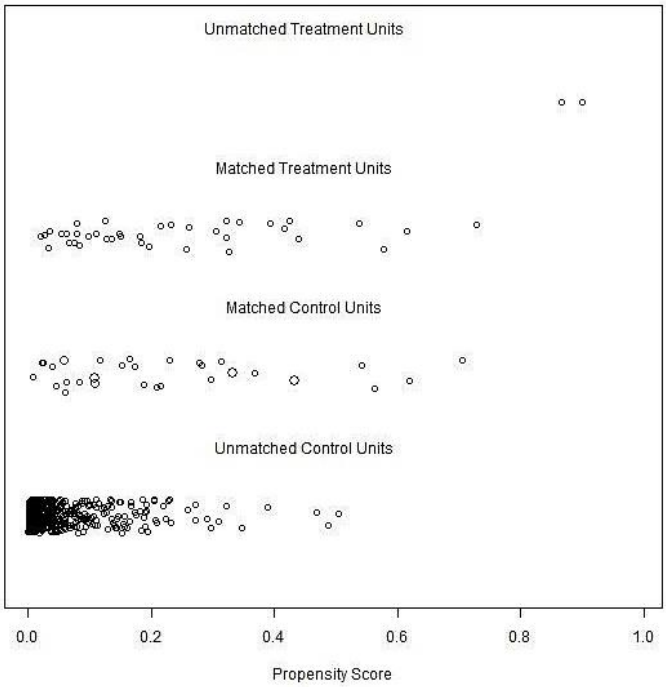
Exhibits C3, C4, and C5 are dot plots of individual students (GWBA and non-GWBA) in either the matched or unmatched groups, for each of the matching algorithms. The large region of common support (i.e., where the dots for the "matched treatment units" and "matched control units" overlap), spanning almost the entire distribution of the propensity score, demonstrate that appropriate matches were found everywhere except for the extreme tail regions.

Exhibit C3. Propensity Score Distribution: Comparison Group 1: OUSD

2013



2014



2015

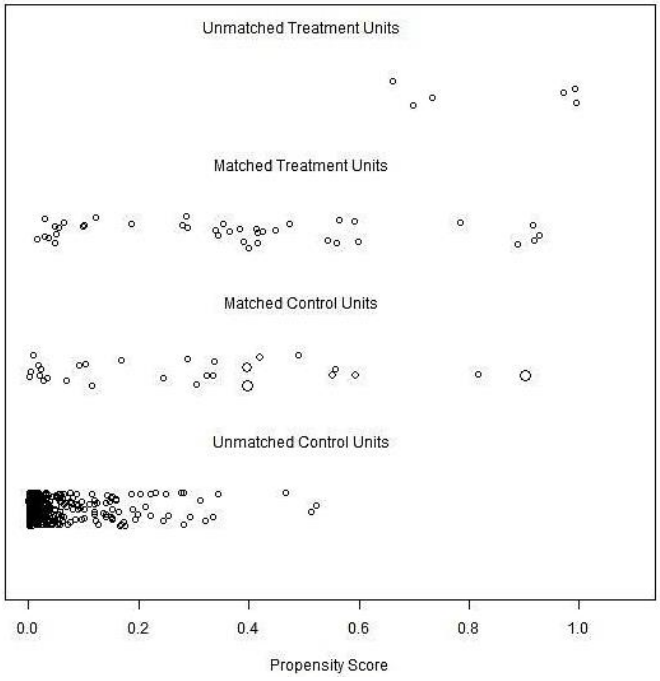
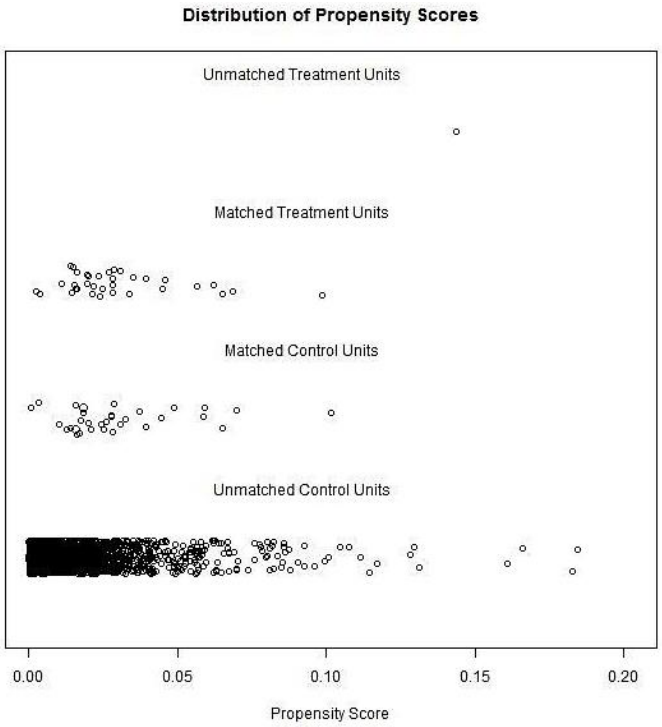
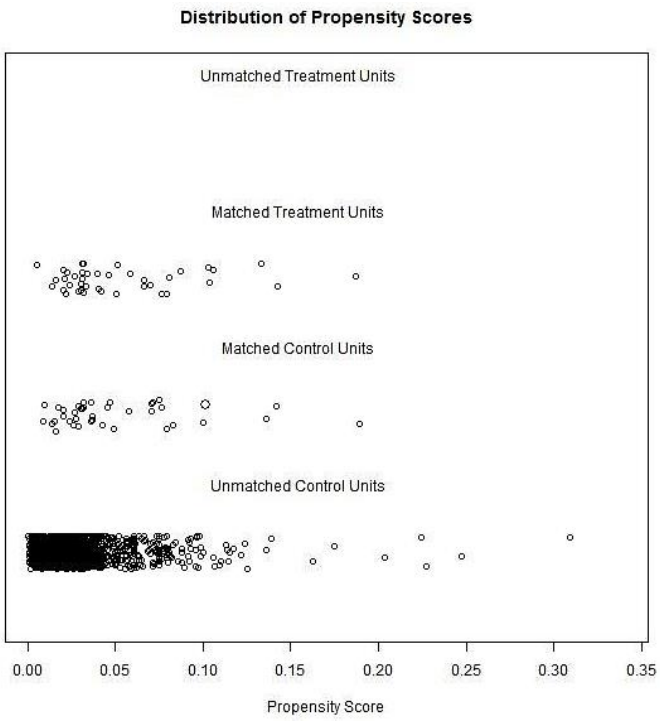


Exhibit C4. Propensity Score Distribution: Comparison Group 1: SFUSD

2013



2014



2015

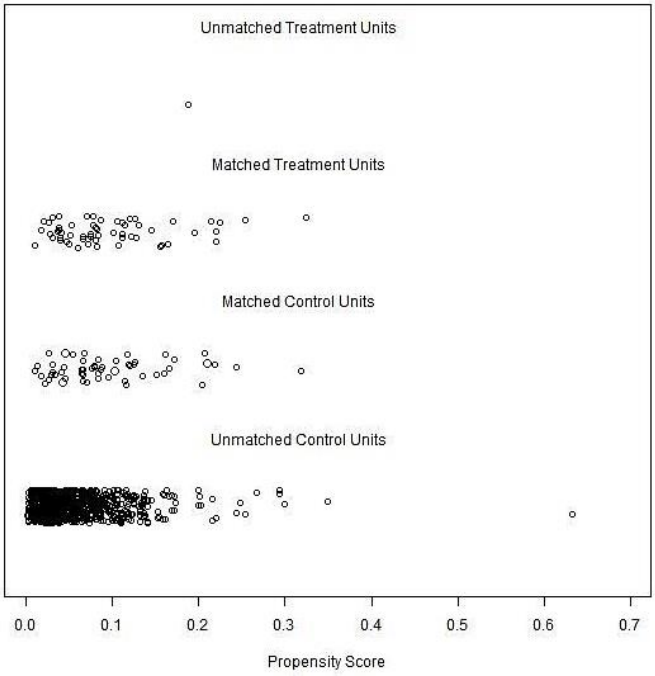
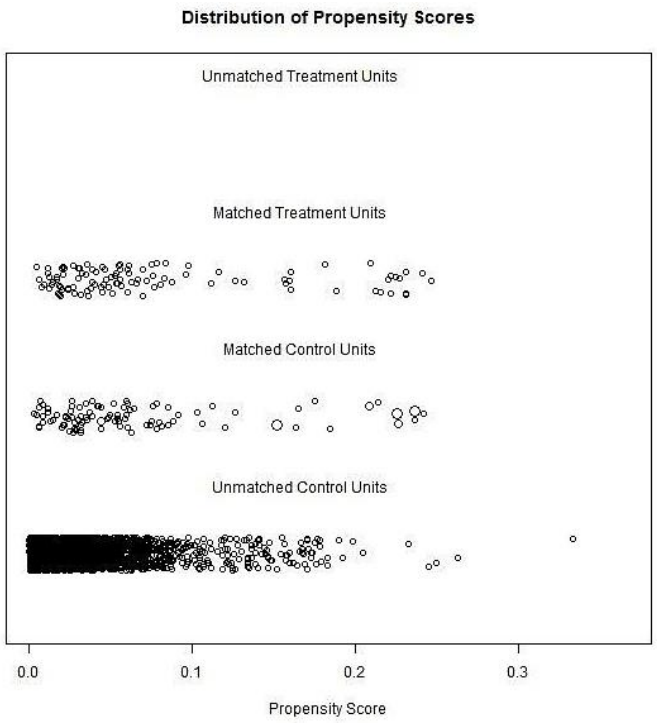
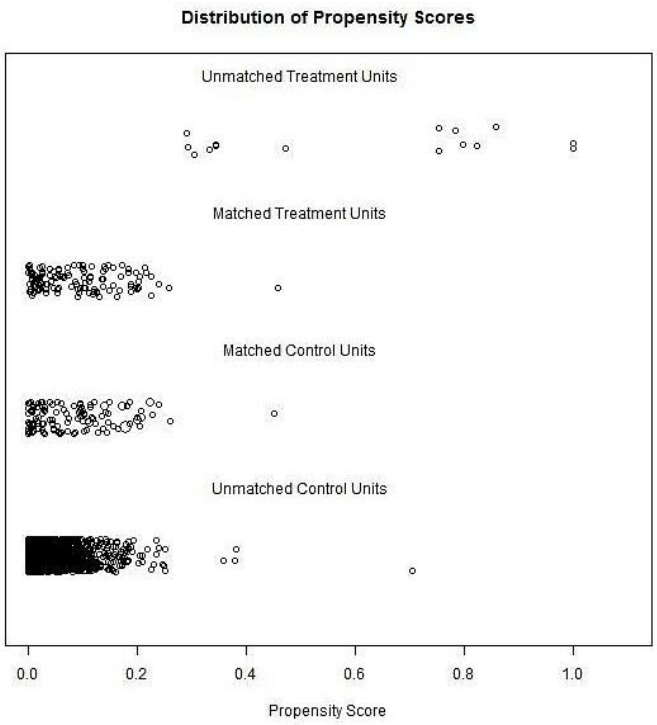


Exhibit C5. Propensity Score Distribution: Comparison Group 2

OUSD



SFUSD



Variable Comparison Before and After Match

The goal of this PSM was to achieve "balance" between the GWBA and non-GWBA groups, based on the matching variables. To assess the strength of the propensity score matching, we check whether the GWBA and non-GWBA groups are more similar after matching than they were before.

Exhibits C6 and C7 compare the mean values and standardized differences for each variable before and after matching. The goal is for the standardized mean differences to be closer to 0 after matching than they were before matching, and to be less than 0.25.

Overall, matching was as good as we expected, given the limitations of the available data. For the Oakland sample (Exhibit C6), three variables highlighted in red (percent absent, race/ethnicity, and gender), had standardized mean differences that were not closer to 0 after matching than they were before matching. Eight variables, highlighted in yellow, had after-match standardized mean differences that were not less than 0.25. For the San Francisco sample (Exhibit C7), five variables had standardized mean differences that were not closer to 0 after matching than they were before matching and four variables had after-match standardized mean differences that were not less than 0.25.

Exhibit C6. Match Variable Balance Before and After Propensity Score Matching, OUSD*

		Comparison Group: Different School									Comparison Group: Same School		
		2013			2014			2015					
Variables		**Means GWBA**	**Means Non-GWBA**	**Std. Mean Diff.**	**Means GWBA**	**Means Non-GWBA**	**Std. Mean Diff.**	**Means GWBA**	**Means Comp.**	**Std. Mean Diff.**	**Means GWBA**	**Means Non-GWBA**	**Std. Mean Diff.**
Academic Information													
Cumulative GPA	Before	3.0	2.2	1.23	3.2	2.2	1.78	3.2	2.0	1.76	3.2	2.5	1.07
	After	3.1	2.9	**0.26**	3.2	3.2	-0.01	3.2	3.2	-0.04	3.2	3.2	0.02
Current GPA	Before	2.9	2.0	0.88	3.3	2.1	1.41	3.2	2.0	1.48	3.2	2.2	1.06
	After	2.8	3.1	-0.22	3.3	3.2	0.09	3.2	3.2	-0.02	3.2	3.1	0.05
Percent Absent	Before	3.5	7.6	-0.97	2.9	8.4	-1.54	4.7	4.6	**0.01**	3.9	6.6	-0.36
	After	4.8	2.2	**0.60**	3.0	1.5	**0.41**	5.0	1.7	**0.32**	3.9	3.4	0.06
Special Education Status	Before	1.1	1.1	-0.31				1.0	1.1	-0.26	1.0	1.1	-0.47
	After	1.1	1.1	0.00				1.1	1.0	0.12	1.0	1.0	-0.06
School Proportion Free or Reduced Priced Lunch	Before	70.1	84.0	-0.85	79.4	80.9	-0.12	77.3	82.2	-0.28			
	After	83.6	80.0	0.22	80.6	79.9	0.06	81.1	83.5	-0.14			
Test Scores													
CAHSEE ELA	Before	386.7	351.0	1.20	378.1	356.0	0.70				376.9	371.4	0.23
	After	378.7	371.9	0.23	376.9	368.2	**0.28**				376.9	373.8	0.13
CAHSEE Math	Before	399.2	356.3	1.35	390.8	360.7	1.04				387.0	377.8	0.39
	After	390.0	378.3	**0.37**	389.7	381.6	**0.28**				387.0	387.3	-0.01
SBAC ELA Literacy Scale Score	Before				2,554.8	2,495.1	0.63	2,533.3	2,493.7	0.36			
	After				2,550.9	2,508.5	**0.45**	2,519.9	2,505.6	0.13			

SBAC Mathematics Scale Score	Before				2,557.3	2,465.7	0.77	2,546.5	2,463.9	0.80			
	After				2,551.1	2,509.2	**0.35**	2,533.2	2,523.7	0.09			
Demographics													
Race/Ethnicity	Before	2.6	2.4	0.10	2.1	2.3	-0.29	2.2	2.5	**-0.15**	2.2	2.3	**-0.08**
	After	2.2	2.1	0.04	2.1	2.0	0.05	2.2	1.9	0.20	2.2	2.0	0.16
English Fluency	Before	2.5	2.2	0.28	2.5	2.4	0.12	2.3	2.3	-0.03	2.4	2.4	0.01
	After	2.5	2.5	0.00	2.5	2.5	0.04	2.2	2.1	0.04	2.4	2.4	-0.02
Home Language	Before	4.1	3.0	0.38	4.1	3.0	0.42	4.2	2.8	0.50	4.1	2.8	0.49
	After	5.4	4.5	**0.30**	3.9	4.7	**-0.32**	4.1	4.5	-0.15	4.1	4.3	-0.05
Gender	Before	1.6	1.6	**0.00**	1.5	1.5	-0.07	1.4	1.5	**-0.14**	1.5	1.5	-0.07
	After	1.4	1.2	**0.36**	1.4	1.4	0.00	1.4	1.3	**0.31**	1.5	1.5	-0.06

* Red numbers (e.g., **0.00)** indicates standardized mean difference after matching not closer to 0
* Yellow numbers (e.g., **0.00)** indicates standardized mean difference after matching not < 0.25

Exhibit C7. Match Variable Balance Before and After Propensity Score Matching, SFUSD*

		Comparison Group: Different School									Comparison Group: Same School		
		2013			2014			2015					
Variables		**Means GWBA**	**Means Non-GWBA**	**Std. Mean Diff.**	**Means GWBA**	**Means Non-GWBA**	**Std. Mean Diff.**	**Means GWBA**	**Means Non-GWBA**	**Std. Mean Diff.**	**Means GWBA**	**Means Non-GWBA**	**Std. Mean Diff.**
Academic Information													
Days Present	Before	171.0	168.5	0.22	183.7	165.5	0.40	173.3	158.5	1.98	173.4	143.0	1.10
	After	170.8	172.6	-0.16	183.7	179.6	0.09	173.2	164.1	**1.23**	168.8	162.8	0.22
Special Education Status	Before	0.0	0.1	-0.42	0.1	0.2	-0.21	0.1	0.2	-0.24	0.1	0.1	-0.04
	After	0.0	0.0	0.00	0.1	0.2	-0.25	0.1	0.1	0.06	0.1	0.0	0.03
School Proportion Free or Reduced Priced Lunch	Before	57.6	60.0	-0.15	65.0	70.0	-0.31	63.6	65.1	-0.12			
	After	57.8	54.9	0.18	65.0	66.1	-0.07	63.4	65.2	-0.14			
Test Scores													
CSELA English Language Arts Score	Before	342.1	371.1	-0.62									
	After	343.7	352.7	-0.19									
CSMath Math Score	Before	315.9	344.3	-0.65									
	After	315.3	318.8	-0.08									
CST Science Placement Level	Before	344.8	357.4	-0.30									
	After	344.5	353.3	-0.21									
Demographics													
Race/Ethnicity	Before	1.5	2.2	-0.75	1.9	2.3	-0.29	2.1	2.7	-0.30	1.9	1.9	**0.02**
	After	1.5	1.5	-0.03	1.9	1.7	0.17	2.2	2.0	0.10	1.9	2.2	-0.24

English Fluency	Before	0.3	0.5	-0.35	0.4	0.5	-0.17	0.3	0.5	-0.46	0.4	0.4	**-0.17**
	After	0.4	0.5	-0.24	0.4	0.4	0.05	0.3	0.2	**0.29**	0.4	0.5	-0.21
Home Language	Before	3.0	2.6	0.13	3.5	2.8	0.26	2.8	3.0	-0.09	3.1	2.5	0.22
	After	3.0	2.0	**0.39**	3.5	3.3	0.09	2.9	2.9	-0.01	2.9	3.2	-0.14
Gender	Before	1.6	1.5	0.29	1.6	1.5	0.09	1.5	1.5	0.09	1.6	1.5	0.13
	After	1.6	1.6	0.12	1.6	1.6	-0.05	1.5	1.6	-0.14	1.6	1.6	-0.02
Father's Education Level	Before	-0.5	-0.5	0.03	-0.6	-0.5	-0.10	-0.1	-0.6	0.41	-0.3	0.4	-0.72
	After	-0.6	-0.3	**-0.26**	-0.6	-0.8	0.18	-0.1	-0.3	0.17	-0.3	-0.3	0.02
Mother's Education Level	Before	-0.2	0.0	-0.24	-0.4	-0.3	-0.10	-0.1	-0.4	0.28	-0.2	0.5	-0.65
	After	-0.2	-0.3	0.05	-0.4	-0.6	**0.20**	-0.1	-0.2	0.12	-0.2	-0.2	-0.01

* Red numbers (e.g., **0.00)** indicates standardized mean difference after matching not closer to 0
* Yellow numbers (e.g., **0.00)** indicates standardized mean difference after matching not < 0.25

Comparison Group 1 (Same Year, Different School)

Exhibit C8. Logistic Regression Models, OUSD

High School Graduation

	B	S.E.	Wald	df	p value	Odds Ratio	95% CI for Odds Ratio		GWBA Effect Size
							Lower	Upper	
GWBA Program Participation	1.68	0.9	3.5	1	0.061	5.4	0.9	31.1	large
Race / Ethnicity	0.32	0.5	0.4	1	0.533	1.4	0.5	3.7	
English Fluency	-0.02	0.4	0.0	1	0.955	1.0	0.4	2.2	
Gender	-0.29	0.8	0.1	1	0.708	0.7	0.2	3.5	
Home Language	0.12	0.2	0.4	1	0.514	1.1	0.8	1.6	
CAHSEE ELA SS	0.01	0.0	0.3	1	0.594	1.0	1.0	1.1	
CAHSEE Math SS	-0.02	0.0	0.5	1	0.461	1.0	0.9	1.0	
Cumulative GPA	0.86	0.6	2.0	1	0.161	2.4	0.7	7.8	
Current GPA	0.81	0.4	4.8	1	0.029	2.3	1.1	4.7	
Schools' Proportion Free or Reduced Priced Lunch	0.03	0.0	0.3	1	0.565	1.0	0.9	1.1	
Attendance	-0.06	0.0	2.3	1	0.134	0.9	0.9	1.0	
SBAC ELA Literacy Scale Score	0.01	0.0	1.4	1	0.237	1.0	1.0	1.0	
SBAC Math Scale Score	0.00	0.0	0.4	1	0.509	1.0	1.0	1.0	
Special Education Status	0.43	1.9	0.1	1	0.818	1.5	0.0	62.3	
Constant	-13.48	18.2	0.5	1	0.460	0.0			

College Enrollment

	B	S.E.	Wald	df	p value	Odds Ratio	95% CI for Odds Ratio		GWBA Effect Size
							Lower	Upper	
GWBA Program Participation	1.32	0.4	8.9	1	0.003	3.8	1.6	9.0	intermediate
Race / Ethnicity	0.09	0.2	0.2	1	0.639	1.1	0.7	1.6	
English Fluency	0.25	0.2	1.5	1	0.228	1.3	0.9	1.9	
Gender	-0.79	0.4	3.3	1	0.070	0.5	0.2	1.1	
Home Language	-0.12	0.1	2.0	1	0.158	0.9	0.7	1.0	
CAHSEE ELA SS	-0.01	0.0	0.5	1	0.479	1.0	1.0	1.0	
CAHSEE Math SS	-0.01	0.0	0.3	1	0.555	1.0	1.0	1.0	
Cumulative GPA	0.91	0.5	3.4	1	0.064	2.5	0.9	6.5	
Current GPA	0.49	0.3	2.5	1	0.117	1.6	0.9	3.0	
Schools' Proportion of Free or Reduced Priced Lunch	0.00	0.0	0.0	1	0.854	1.0	0.9	1.0	
Attendance	0.00	0.0	0.0	1	0.894	1.0	0.9	1.1	
SBAC ELA Literacy Scale Score	0.01	0.0	3.1	1	0.077	1.0	1.0	1.0	
SBAC Math Scale Score	0.00	0.0	0.2	1	0.639	1.0	1.0	1.0	
Special Education Status	-0.97	1.2	0.6	1	0.431	0.4	0.0	4.3	
Constant	-7.77	8.9	0.8	1	0.381	0.0			

College Persistence (Cohort 2 + 3 only)									
	B	**S.E.**	**Wald**	**df**	**p value**	**Odds Ratio**	**95% CI for Odds Ratio**		**GWBA Effect Size**
							Lower	**Upper**	
GWBA Program Participation	0.79	0.6	1.5	1	0.219	2.2	0.6	7.7	small
Race / Ethnicity	0.43	0.4	1.3	1	0.248	1.5	0.7	3.2	
English Fluency	0.19	0.3	0.4	1	0.553	1.2	0.7	2.2	
Gender	-0.65	0.7	0.9	1	0.350	0.5	0.1	2.0	
Home Language	0.01	0.1	0.0	1	0.958	1.0	0.8	1.3	
CAHSEE ELA SS	-0.01	0.0	0.5	1	0.499	1.0	1.0	1.0	
CAHSEE Math SS	-0.01	0.0	0.3	1	0.559	1.0	1.0	1.0	
Cumulative GPA	1.33	0.8	2.8	1	0.092	3.8	0.8	17.8	
Current GPA	0.73	0.5	2.1	1	0.152	2.1	0.8	5.6	
Schools' Proportion Free or Reduced Priced Lunch	-0.06	0.0	2.4	1	0.119	0.9	0.9	1.0	
Attendance	-0.18	0.1	2.8	1	0.091	0.8	0.7	1.0	
SBAC ELA Literacy Scale Score	0.01	0.0	1.9	1	0.170	1.0	1.0	1.0	
SBAC Math Scale Score	0.00	0.0	0.2	1	0.695	1.0	1.0	1.0	
Special Education Status	-0.50	2.1	0.1	1	0.813	0.6	0.0	37.0	
Constant	-17.07	12.7	1.8	1	0.179	0.0			

Exhibit C9. Logistic Regression Models, SFUSD

High School Graduation

	B	S.E.	Wald	df	p value	Odds Ratio	95% C.I. for Odds Ratio		GWBA Effect Size
							Lower	Upper	
GWBA Program Participation	3.55	1.1	10.5	1	0.001	34.7	4.0	296.7	large
Gender	-0.85	0.7	1.7	1	0.194	0.4	0.1	1.5	
Race / Ethnicity	-0.31	0.3	1.1	1	0.295	0.7	0.4	1.3	
Dominant Language	-0.12	0.2	0.6	1	0.424	0.9	0.7	1.2	
English Fluency	-0.11	0.7	0.0	1	0.863	0.9	0.2	3.3	
Father's Education	0.38	0.5	0.5	1	0.491	1.5	0.5	4.2	
Mother's Education	-0.41	0.5	0.7	1	0.412	0.7	0.2	1.8	
Special Education Status	-1.59	0.8	3.6	1	0.056	0.2	0.0	1.0	
CSELA English Language Arts Score	0.01	0.0	0.8	1	0.366	1.0	1.0	1.0	
CSMath Math Score	0.00	0.0	0.0	1	0.875	1.0	1.0	1.0	
CSSci Science Score	0.00	0.0	0.0	1	0.880	1.0	1.0	1.0	
Schools' Proportion of Students Eligible for Free or Reduced Priced Lunch	-0.03	0.0	2.8	1	0.091	1.0	0.9	1.0	
Attendance	0.00	0.0	0.0	1	0.974	1.0	1.0	1.0	
Constant	2.47	4.4	0.3	1	0.570	11.8			

College Enrollment

	B	S.E.	Wald	df	p value	Odds Ratio	95% C.I. for Odds Ratio		GWBA Effect Size
							Lower	Upper	
GWBA Program Participation	1.29	0.3	19.5	1	0.000	3.6	2.1	6.5	medium
Gender	0.06	0.3	0.0	1	0.850	1.1	0.6	1.9	
Race / Ethnicity	-0.25	0.1	5.2	1	0.023	0.8	0.6	1.0	
Dominant Language	-0.06	0.1	0.7	1	0.417	0.9	0.8	1.1	
English Fluency	-0.56	0.3	3.6	1	0.058	0.6	0.3	1.0	
Father's Education	-0.16	0.3	0.3	1	0.578	0.9	0.5	1.5	
Mother's Education	0.30	0.3	1.3	1	0.252	1.4	0.8	2.3	
Special Education Status	-2.08	0.6	11.9	1	0.001	0.1	0.0	0.4	
CSELA English Language Arts Score	0.00	0.0	0.3	1	0.580	1.0	1.0	1.0	
CSMath Math Score	0.01	0.0	2.7	1	0.101	1.0	1.0	1.0	
CSSci Science Score	0.00	0.0	0.0	1	0.856	1.0	1.0	1.0	
Schools' Proportion of Students Eligible for Free or Reduced Priced Lunch	0.00	0.0	0.3	1	0.598	1.0	1.0	1.0	
Attendance	0.00	0.0	0.0	1	0.871	1.0	1.0	1.0	
Constant	-1.11	2.7	0.2	1	0.681	0.3			

College Persistence (Cohort 2 + 3 only)

	B	S.E.	Wald	df	p value	Odds Ratio	95% C.I. for Odds Ratio		GWBA Effect Size
							Lower	Upper	
GWBA Program Participation	1.01	0.4	6.0	1	0.014	2.8	1.2	6.2	medium
Gender	-0.19	0.4	0.2	1	0.645	0.8	0.4	1.9	
Race / Ethnicity	-0.33	0.2	3.0	1	0.081	0.7	0.5	1.0	
Dominant Language	-0.07	0.1	0.5	1	0.498	0.9	0.8	1.1	
English Fluency	-0.66	0.4	2.4	1	0.120	0.5	0.2	1.2	
Father's Education	-0.23	0.4	0.4	1	0.548	0.8	0.4	1.7	
Mother's Education	0.52	0.3	2.3	1	0.133	1.7	0.9	3.3	
Special Education Status	-2.27	0.8	7.4	1	0.007	0.1	0.0	0.5	
CSELA English Language Arts Score	-0.01	0.0	1.1	1	0.292	1.0	1.0	1.0	
CSMath Math Score	0.02	0.0	3.8	1	0.051	1.0	1.0	1.0	
CSSci Science Score	0.00	0.0	0.1	1	0.811	1.0	1.0	1.0	
Schools' Proportion of Students Eligible for Free or Reduced Priced Lunch	0.00	0.0	0.0	1	0.891	1.0	1.0	1.0	
Attendance	-0.01	0.0	2.6	1	0.107	1.0	1.0	1.0	
Constant	0.21	3.2	0.0	1	0.947	1.2			

Comparison Group 2 (Same Year, Different School)

Exhibit C10. Logistic Regression Model, OUSD

High School Graduation

	B	S.E.	Wald	df	p value	Odds Ratio	95% Odds Ratio		GWBA Effect Size
							Lower	Upper	
GWBA Program Participation	3.18	1.4	5.1	1	0.024	24.1	1.5	377.6	large
Race / Ethnicity	-0.46	0.4	1.6	1	0.201	0.6	0.3	1.3	
English Fluency	1.00	0.4	5.8	1	0.016	2.7	1.2	6.1	
Gender	0.11	0.8	0.0	1	0.897	1.1	0.2	5.5	
Home Language	-0.46	0.2	5.3	1	0.021	0.6	0.4	0.9	
Special Education Status	-1.46	1.7	0.8	1	0.379	0.2	0.0	6.0	
CAHSEE ELA SS	-0.01	0.0	0.1	1	0.736	1.0	0.9	1.0	
CAHSEE Math SS	-0.05	0.0	1.4	1	0.236	1.0	0.9	1.0	
Cumulative GPA	-0.96	1.2	0.6	1	0.433	0.4	0.0	4.2	
Current GPA	2.09	0.9	5.5	1	0.019	8.1	1.4	46.7	
SBAC ELA Literacy Scale Score	0.03	0.0	6.5	1	0.011	1.0	1.0	1.1	
SBAC Math Scale Score	-0.01	0.0	0.4	1	0.506	1.0	1.0	1.0	
Constant	-34.23	42.4	0.7	1	0.419	0.0			

College Enrollment

	B	S.E.	Wald	df	p value	Odds Ratio	95% Odds Ratio		GWBA Effect Size
							Lower	Upper	
GWBA Program Participation	0.25	0.4	0.3	1	0.559	1.3	0.6	3.0	none
Race / Ethnicity	-0.13	0.2	0.6	1	0.428	0.9	0.6	1.2	
English Fluency	0.28	0.2	2.3	1	0.127	1.3	0.9	1.9	
Gender	-0.92	0.4	4.2	1	0.040	0.4	0.2	1.0	
Home Language	-0.14	0.1	3.1	1	0.078	0.9	0.7	1.0	
CAHSEE ELA SS	0.02	0.0	1.8	1	0.175	1.0	1.0	1.1	
CAHSEE Math SS	-0.02	0.0	1.2	1	0.281	1.0	1.0	1.0	
Cumulative GPA	0.44	0.6	0.6	1	0.432	1.6	0.5	4.7	
Current GPA	0.77	0.4	4.4	1	0.035	2.2	1.1	4.4	
SBAC ELA Literacy Scale Score	0.00	0.0	0.7	1	0.410	1.0	1.0	1.0	
SBAC Math Scale Score	0.00	0.0	0.9	1	0.344	1.0	1.0	1.0	
Special Education Status	0.44	1.2	0.1	1	0.718	1.6	0.1	16.9	
Constant	-21.57	11.5	3.5	1	0.061	0.0			

College Persistence (Cohort 2+3)

	B	S.E.	Wald	df	p value	Odds Ratio	95% Odds Ratio		GWBA Effect Size
							Lower	Upper	
GWBA Program Participation	-0.04	0.5	0.0	1	0.940	1.0	0.4	2.4	none
Race / Ethnicity	-0.22	0.2	1.3	1	0.263	0.8	0.5	1.2	
English Fluency	0.44	0.2	4.3	1	0.038	1.5	1.0	2.3	
Gender	-0.91	0.5	3.4	1	0.065	0.4	0.2	1.1	
Home Language	-0.10	0.1	1.2	1	0.271	0.9	0.8	1.1	
CAHSEE ELA SS	0.02	0.0	2.3	1	0.129	1.0	1.0	1.1	
CAHSEE Math SS	0.00	0.0	0.0	1	0.996	1.0	1.0	1.0	
Cumulative GPA	0.07	0.6	0.0	1	0.906	1.1	0.3	3.7	
Current GPA	1.05	0.4	6.0	1	0.014	2.9	1.2	6.6	
SBAC ELA Literacy Scale Score	0.00	0.0	0.0	1	0.895	1.0	1.0	1.0	
SBAC Math Scale Score	0.00	0.0	0.6	1	0.441	1.0	1.0	1.0	
Constant	-19.36	13.9	2.0	1	0.162	0.0			

Exhibit C11. Logistic Regression Model, SFUSD

High School Graduation

	B	S.E.	Wald	df	p value	Odds Ratio	95% Odds Ratio		GWBA Effect Size
							Lower	Upper	
GWBA Program Participation	2.33	1.1	4.7	1	0.031	10.2	1.2	84.4	large
Gender	0.37	0.7	0.3	1	0.571	1.4	0.4	5.2	
Race / Ethnicity	-0.22	0.1	2.8	1	0.092	0.8	0.6	1.0	
Dominant Language	-0.04	0.1	0.1	1	0.711	1.0	0.8	1.2	
English Fluency	0.32	0.7	0.2	1	0.665	1.4	0.3	6.0	
Father's Education	-0.17	0.5	0.1	1	0.748	0.8	0.3	2.4	
Mother's Education	0.57	0.5	1.2	1	0.275	1.8	0.6	4.9	
CSELA English Language Arts Score	-0.01	0.1	0.0	1	0.914	1.0	0.9	1.1	
CSMath Math Score	0.01	0.1	0.0	1	0.910	1.0	0.9	1.1	
CSSci Science Score	0.00	0.1	0.0	1	0.958	1.0	0.9	1.2	
Constant	4.43	23.4	0.0	1	0.850	83.9			

College Enrollment

	B	S.E.	Wald	df	p value	Odds Ratio	95% Odds Ratio		GWBA Effect Size
							Lower	Upper	
GWBA Program Participation	0.33	0.4	0.9	1	0.353	1.4	0.7	2.8	none
Gender	-0.34	0.3	1.0	1	0.321	0.7	0.4	1.4	
Race / Ethnicity	-0.17	0.1	4.0	1	0.044	0.8	0.7	1.0	
Dominant Language	-0.03	0.1	0.1	1	0.706	1.0	0.8	1.1	
English Fluency	-0.76	0.4	4.4	1	0.036	0.5	0.2	1.0	
Father's Education	-0.46	0.3	2.8	1	0.095	0.6	0.4	1.1	
Mother's Education	0.57	0.3	4.8	1	0.029	1.8	1.1	3.0	
Special Education Status	-1.74	0.7	6.2	1	0.013	0.2	0.0	0.7	
CSELA English Language Arts Score	-0.04	0.0	5.7	1	0.017	1.0	0.9	1.0	
CSMath Math Score	0.06	0.0	10.5	1	0.001	1.1	1.0	1.1	
CSSci Science Score	-0.02	0.0	1.1	1	0.285	1.0	1.0	1.0	
Constant	1.80	5.4	0.1	1	0.737	6.1			

College Persistence (Cohort 2+3)

	B	S.E.	Wald	df	p value	Odds Ratio	95% Odds Ratio		GWBA Effect Size
							Lower	Upper	
GWBA Program Participation	1.77	0.7	6.4	1	0.011	5.9	1.5	22.9	large
Gender	-0.83	0.4	3.6	1	0.057	0.4	0.2	1.0	
Race / Ethnicity	-0.14	0.1	1.9	1	0.165	0.9	0.7	1.1	
Dominant Language	0.00	0.1	0.0	1	0.997	1.0	0.9	1.2	
English Fluency	-0.65	0.5	2.1	1	0.150	0.5	0.2	1.3	
Father's Education	-0.40	0.3	1.9	1	0.169	0.7	0.4	1.2	
Mother's Education	0.43	0.3	2.6	1	0.106	1.5	0.9	2.6	
Special Education Status	-0.58	0.9	0.4	1	0.514	0.6	0.1	3.2	
CSELA English Language Arts Score	-0.06	0.0	8.2	1	0.004	0.9	0.9	1.0	
CSMath Math Score	0.09	0.0	12.3	1	0.000	1.1	1.0	1.2	
CSSci Science Score	-0.03	0.0	2.8	1	0.093	1.0	0.9	1.0	
Constant	3.38	6.1	0.3	1	0.579	29.5			

Limitations

Overall, the propensity score matches met expectation, given that all PSM settings were selected to maximize the strength of matches, and the following limitations.

- Ideally, matches would be made on characteristics that determine entry into the GWBA program, e.g., motivation, social connection to past GWBA students, affinity to tech work, income, supportive home environment, etc. However, since we were limited to administrative data, we did not have these types of variables.

- Other than percent of student body receiving Free and Reduced Price Lunch, we do not have any data on "school level factors" that could influence both GWBA participation and outcomes. For example, GWBA is not random in their selection of schools, so non-GWBA schools are likely different in some, potentially meaningful, way that may not be fully captured using student level data.

- Changes in standardized tests over time and between districts severely limited the comparisons we could make based on this important variable, which mostly affected Group 2 where the GWBA and comparison groups were in different graduating classes.

- GWBA cohorts had a small number of people, which was compounded by the PSM requirement for no missing data. This limited the statistical power to detect differences, regardless of analytic method.

Despite these limitations, the PSM method provided added insight into the impact of the GWBA program, based on counterfactual comparison groups of similar, but untreated, students.

Appendix D

Survey Non-Response Analysis

As noted in the report, students who completed the Years 1-3 follow up surveys were much more likely to have completed the GWBA program. Exhibit D1 illustrates these differences.

Exhibit D1. Response Rates by Program Completers and Non-Completers

	Completers	Non-Completers	Total
Year 1 (C2-4)	86%	21%	63%
Year 2 (C2-3)	68%	18%	52%
Year 3 (C2)	58%	12%	45%

Methods

To evaluate potential response bias, we compared students who did and did not respond to the follow up surveys using information they reported in the baseline survey. Statistically significant differences were assessed at the $p<.05$ level, using chi-squared for categorical variables and ANOVA for continuous variables.

Comparisons between responders and non-responders were made using all items in the baseline survey, i.e., demographics, work experience, school performance, confidence, interest in IT, grit, educational aspirations, support of family and friends, college and career knowledge, and career aspirations.

Year One Follow Up

Since there was a large difference in the response rates for students who did (89 percent) and did not (21 percent) complete the program, subsequent analyses were conducted only among program completers.

Among students who finished the GWBA program, responders were more likely than non-responders to have a high GPA, believe that college is important to them, report that they are motivated to go to college, and see benefits of college. Responders less likely to pursue military service before college.

Alumni Follow Up

As with the first follow up, there was a large difference in response rate between students who had (67 percent) and had not (21 percent) completed the GWBA program; subsequent analyses were conducted only among program completers.

Comparison results were also similar to those of the Year One survey, above. Fewer comparisons were statistically significant, however, due to a smaller sample size and subsequent lower statistical power, since only cohorts 2 and 3 completed the alumni follow up survey.

Among those who completed the GWBA program, responders more likely to have high GPA and less likely to pursue military service. Responders were also more likely to believe education will help them get the career they desire and less likely to need to work to support their families.

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