

PROJECT SOL:
Secondary On-line Learning

**Preparing Secondary English Learners for
Graduation and College**



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with Ursula Aldana, Marco Diaz, Megan Hopkins,
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The Civil Rights Project



Proyecto Derechos Civiles

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The Project SOL researchers would like to thank the students, teachers, counselors, and principals who welcomed our team into their classrooms from 2008-2012. We culled invaluable lessons from the educators' insights and experiences, and we remain inspired by their devotion, service and wisdom. We are utilizing this research to inform additional initiatives geared to overcoming a pattern of undereducation and poverty that has persisted for far too long in Spanish-speaking immigrant communities.

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I. Overview of the Study

The SOL (Secondary Online Learning) Project set out to provide a means by which Spanish-speaking high school immigrant students with very limited English could continue their education, while they learned English, and have a viable chance at graduating high school and preparing for college. Our research had shown that many young people who enter the U.S. as adolescents without knowledge of English languish in schools that are not prepared to serve them, and too often simply drop out. We believed that if we trained and supported teachers in the use of a Spanish language, online curriculum, in the core areas of math and science aligned to California's standards and acceptable for college preparatory credit, and if we offered support services to the students and to their parents, we could increase graduation rates and matriculation into college. We hoped to provide an antidote to the heartbreaking dropout statistics for adolescent Spanish speaking English learners.

As this report shows, we did accomplish a great deal. We provided almost 500 Spanish-speaking immigrant students access to key courses resulting in almost 1000 college preparatory course enrollments, and most of the students passed those courses. We opened students' eyes to future possibilities they were not aware of, and we helped get critical information to parents about how to support and advocate for their children. We helped teachers to blossom into technologically savvy, expert bilingual educators with a deepened passion for serving these students. We also fundamentally changed the view of teachers about what these students were capable of, and we helped schools to realize new ways to address these students' needs. But we also discovered that many more things than we initially anticipated encountering were beyond our control, and that one intervention into the lives of children who are battered and buffeted by circumstances beyond *their* control is not sufficient to change lives, at least not in the short run. In the following pages we recount our triumphs as well as our disappointments, and we also share our vision of what a truly equitable education for immigrant students might look like.

II. Overview of the Challenge

Across the nation about 11 percent of all K-12 students are English Learners (ELs), representing a little more than 5 million students (MPI, 2013). These students have been designated by their schools as lacking sufficient English ability to participate meaningfully in the regular academic instruction provided in English without some form of additional support. The numbers remain an estimate, as there is considerable variation state by state in how these students are identified and how they are exited (or “redesignated”) from the category (Ragan & Lesaux, 2006). As such, these numbers can be considered conservative. Moreover, there are many students in the public schools across the nation who were designated EL at one time, lost that designation by passing some kind of assessment, but who nonetheless still require support to catch up with their English proficient peers. Recent research (Rios-Aguilar & Gándara, 2012; Robinson 2011) suggests that some of these students may, in fact, perform worse than their peers who remain in the EL designation, either because they are prematurely redesignated or because they lack appropriate supportive services. This begs the question of who should be designated as needing special supportive services, and if it even makes sense to treat some redesignated EL students as though they no longer are EL. Roughly twice as many students – or more than 20 percent—come from homes in which a language other than English is spoken, and the great majority of these students begin school as English Learners. Nationally about three-fourths speak Spanish as their primary language (MPI, 213).

Altogether, the EL population of the United States is roughly the same in size as the Special Education population, however these students generally receive far less attention and far fewer resources to address their unique needs. In fact, while the federal legislation authorized under the Elementary and Secondary Education Act (ESEA), otherwise known as No Child Left Behind (NCLB), has explicitly addressed requirements for teachers of special education students, it has not done so for English learners. The last evidence collected on this issue (Zehler, et al., 2003) showed that while at least 40 percent of teachers had EL students in their classrooms, relatively few actually had any relevant training to teach them. A more recent study in California surveying 5300 educators of EL students found that 43 percent of teachers whose classrooms were more than 50 percent EL had received either no in-service training or only one session over the prior 5 years (Gándara et al., 2005). We do not know the quality of the single session that was provided, nor how long it lasted. It is safe to conclude, however, that the attention dedicated to helping teachers meet the needs of EL students was sorely inadequate, given that the challenge of teaching students in a language they do not understand is considerable.

California accounts for about one-fourth of all EL students in the U.S., or about 1.4 million English Learners. About 83 percent of the EL students in California speak Spanish as their primary language. This fact is important because it suggests that, while many languages are spoken in the state, the overwhelming majority of EL students speak only one language, and so programs and interventions can be developed for large numbers and concentrations of students. ELs represent almost one-fourth (23.4%) of all the K-12 students in the state, yet only .015 percent of teachers hold a bilingual credential and teach in a setting in which they use the primary language of the students. Very few of these teachers are located at the secondary level as there are virtually no bilingual programs at that level. Yet, 29 percent of EL students are enrolled in the secondary schools of the state (CDE, 2013). Although many if not most of these ELs are incapable of taking a core college preparatory course in English, it was estimated at the beginning of this project that at least 120,000 students could profit by taking such demanding college preparatory courses at least partially in their primary language. In other words, they could profit from bilingual courses. Not only would this allow the students to better understand the instruction, but it also would lead to more of these students being eligible to take these key courses, as a number of studies have shown that students designated as EL are routinely excluded from taking rigorous college preparatory courses (Callahan 2004, 2005; Callahan & Gándara, 2004). But California is not prepared to provide this coursework in the primary language of the students, and almost no high schools in the state report doing so for more than one or two classes (Stevens & Castellanos, 2012).

In general, English Learners in California's secondary schools fare very poorly and as a consequence are at substantial risk for poor social and educational outcomes. Many will drop out of high school. Nationally, the Pew Hispanic Center estimates that 40% of 16-19 year old Latinos educated at least partially outside of the U.S. drop out of U.S. high schools. Based on our analyses of Los Angeles Unified School district data, it appears that little more than a quarter of students who are classified as English Learners in the 9th grade are likely to graduate with a diploma from that school system four years later (LAUSD data analysis, 2008). And, there is evidence that the relatively small percentage of Latino immigrants who are English Learners during their high school years and who do manage to graduate will not be adequately prepared for postsecondary education. In a northern California study of 350 secondary English Learners enrolled in one high school, on average the students did not complete even half of the minimum requirements for college eligibility, and only one senior in the graduating cohort went on to a four year university (Callahan, 2004). Secondary English Learners who are still dominant in Spanish, and who may or may not have studied in their home country, often find themselves in US high schools taking courses that will lead neither to

postsecondary preparation nor to high school graduation. A typical program for these students can include three hours daily of English as a Second Language – usually no more than one of which counts as credit toward graduation—and a potpourri of whatever is available at the school that requires little use of language. This often will include physical education, remedial math, art, or vocational courses (Callahan & Gándara, 2004) that may or may not even count for high school graduation, especially when they are taken over and over again.

Latino students—who are overwhelmingly of Mexican origin and more than twice as likely as other Latinos to drop out of school (Ruiz de Velasco & Fix, 2000)—are now the majority of the high school population in the state (as they are in New Mexico and Texas as well). This fact is ominous for both the state as well as for these individuals. Undereducated youth not only pay fewer taxes and burden the social service system disproportionately; they are at greater risk for all kinds of social ills that also require additional public intervention and associated costs. A report from the National Center for Higher Education Management Systems (2005) has projected that if California does not immediately begin preparing more underrepresented students for higher education, by 2020 the state will experience an 11% drop in per capita income, resulting in serious economic hardship for the people of California. Another study published in 2008 (Johnson, 2008) projected that California would be 1 million college degrees short of being able to fill jobs that required this level of education by 2025 if the state did not begin producing more BA degrees immediately. Of course, the largest group of students in the state, and the least likely of all major groups to gain a college degree, are Latinos, of which a large percentage are immigrants or children of immigrants whose primary language is usually Spanish.

While the challenge of educating many of these students to high school graduation and preparation for college is significant, it is not insurmountable, especially given the human resources of the state and the possibilities for partnership with our southern neighbors. And, in fact, about a decade ago, the University of California Office of the President, through its UC College Preparatory Online Learning program (or UCCP), began collaborating with the Mexican Secretariat of Education to develop a California standards-aligned, online program of math and science college preparatory courses that students could take in the US and receive high school graduation and college preparatory credit. However, the initial work of the alignments was never brought to fruition in terms of offering the courses to students as the administration for the program was dismantled and the University faced difficult financial cutbacks. At UCLA, the Civil Rights Project realized the potential for the use of such a curriculum, particularly as it aligned with decades of research we had conducted and reviewed. We were fortunate to be able to convince some very significant supporters to invest in our dream. The Irvine

Foundation, first through Jorge Ruiz de Velasco and then through Anne Stanton, signed on to help fund a demonstration project, then the Gates Foundation with the support of Melissa Chabran, and the Carnegie Foundation, with Andrés Henríquez, agreed to also fund the project. The Project, known as Project SOL (Secondary Online Learning), came into being in 2008 and was able to stretch its dollars to actually support a 4-year demonstration (one year more than initially budgeted). The last data were collected with the end of the academic year 2012. Next we describe what that program consisted of and the methods we used to study it.

III. Description of the Study and Methods

Core Elements of the Demonstration Project

The primary goal of the project was to provide California standards-aligned, A-G¹ college preparatory Mexican online curriculum to students who otherwise would not have access to such a curriculum because they did not have sufficient command of English to take and pass rigorous courses designed for fluent English speakers. The SOL Project targeted secondary English Learners (ELs) who had sufficient prior schooling to be “within striking distance” of taking and passing Algebra 1 and/or Biology as it is offered in the California high school curriculum. (By “striking distance” we meant to provide some flexibility for counselors to select students who they thought could do the work, perhaps with some special support, independent of their school records, which may or may not have accurately reflected their abilities and drive.) In spite of the fact that many immigrant students have sufficient preparation to take these courses, this is the most high-risk group for dropping out of school because most California schools do not offer courses they can take. While the primary goal of the program was to deliver the curriculum, Project SOL had “many moving parts” and operated on several dimensions. In addition to the online curriculum, the Project provided intensive and ongoing professional development for teachers and counselors, a support club for students, a collaboration with PIQE (Parent Institute for Quality Education) to provide courses for parents in supporting and advocating for their children, and a number of ancillary activities like special counseling for undocumented students, and field trips to college campuses.

Access to the A-G curriculum in Project SOL was facilitated by providing intensive professional development for teachers selected by their principals to participate in

Courses must be certified through the university course-approval process.

the demonstration project, which occurred initially during the summer prior to school opening, and in some cases at the beginning of the academic year. After teachers were familiar with the curriculum, they were trained in how to register students through the Mexican *Colegio de Bachilleres* and to access the online courses. At the same time that students were provided access to the curriculum, the project built the capacity for California high school teachers to deliver a bilingual course to EL students. Teachers, counselors, and principals in the project were part of a consciously designed Learning Community and had opportunities during the year to meet with each other across school sites and develop a strong *esprit de corps*, and to share best practices they had developed.

Teachers were helped to write lesson plans and to consider how they would introduce the online curriculum into the courses they were already teaching. No teacher was asked to completely abandon his or her already developed lesson plans, materials, and texts. Rather the idea was to use the online curriculum ideally three times per week and to integrate it into the course they were already teaching. This strategy was based on a belief that we would be working with skilled and experienced teachers who had already developed a curriculum that was working well for them, but that did not necessarily meet the needs of EL students. It also sought to respect the autonomy and expertise of teachers, thus allowing them to make decisions about how best to integrate the SOL curriculum into their instructional activities. It turned out that we did not always have skilled and experienced teachers in the subjects covered by the curriculum. Although promised such teachers, principals sometimes were not able to identify or convince such teachers to participate, and so the project worked with the teachers it received. Fortunately, in most cases, those teachers were, or became, exceptional.

The proposed Project also incorporated a bilingual counselor/mentor who would help identify students for participation, keep track of the students and advise them, and also collect data to monitor student success. In addition to aiding the research arm of the project, this individual would help to ensure that students remained on track for graduation. In reality, the counselor came to play both a larger, and, in some cases, a smaller, role than originally envisioned. Counselors worked hand-in-hand with teachers in supporting students and their families and in most cases took over coordination of the Project at the school site level. As the SOL Club was introduced, they also oversaw the Club and its activities, helped in setting up specialized counseling sessions and field trips, and coordinated PIQE parent sessions and orientations at the school site. In many cases, however, the counselor did not have the authority to over-ride administrative decisions about who would be assigned to SOL classes, and this became a problem, which we will discuss later.

The original plan was to augment our US teachers with online teachers from Mexico who were familiar with the curriculum and who could provide additional support for the students. It was also thought at the time that these online Mexican teachers might make it possible to use the curriculum with teachers who were not fluent Spanish speakers, or who might not speak Spanish at all. For the most part, this did not materialize. We found that English-only teachers were not able to manage the language and instructional demands of a bilingual curriculum, even with support. And unfortunately, the Mexican online teacher support was uneven at best.

Another element of the Project that we initially proposed was to provide a University of California-Mexican Secretariat of Education-developed protocol and the training to use it, for determining the equivalence of Mexican high school courses to California A-G courses. There is a significant problem in many districts of knowing how to assess and credit learning that has occurred outside the country, and in this case principally in Mexico. As a result many students repeat courses they have already mastered, and many students are placed well below their appropriate instructional level because of the inability of schools to determine the content of their prior courses. However, as it turned out, the schools and districts that we ultimately selected to partner with had already met this challenge and all were able to provide students with course credit where it was warranted. Thus this element of the Project was dropped, although it remains a problem for many other districts in California and in other states.

The project also proposed to offer a strengthened English-language development component to help ensure that students were able to make rapid progress in learning English and in passing required exams such as the CAHSEE. We had assumed that because students would not have to repeat courses already taken in Mexico (or elsewhere) and would have opportunities to take courses online outside of the school day, it would be possible to take intensive English Language Development (ELD) without jeopardizing their chances of completing high school and earning sufficient A-G credits. We also articulated our professional development with the WRITE Institute in the first year to provide teachers with content-aligned materials to enrich and enhance their ELD curricula in academic English.

In addition to all of the above elements, Project SOL added two features that were not initially contemplated. The SOL Club was used to help provide a supportive peer group for the SOL students; and PIQE, the parent education program developed about three decades ago in the San Diego area, was utilized to help familiarize immigrant parents with the US schools, with their rights as well as their

responsibilities, and to give them the tools to both monitor their children's progress and advocate for them.

In sum, the various elements of the Project SOL Demonstration included:

1. Online access to California standards aligned, A-G curriculum in the regular classroom;
2. Intensive and extensive professional development for teachers and counselors dealing not only with the curriculum and the use of technology in the classroom, but with issues unique to immigrant students;
3. Specialized counseling support of students and parents, including things like rights of undocumented students, financial aid, and college preparation;
4. Special instruction in content-aligned ELD and writing activities to augment the SOL curriculum
5. SOL Club to provide activities and peer support for SOL students
6. A parent education program provided principally by PIQE

Administrative Structure

The project was directed by the Principal Investigator, Patricia Gándara, Professor of Education and Co-Director of the Civil Rights Project/*Proyecto Derechos Civiles* at UCLA, who supervised a staff of about six graduate students and some undergraduate volunteers over the four year period of the study. The Project also had an Advisory Board, composed of six national advisors, who met twice during the period of the grant. It was the intention of the Project to meet annually with the advisors, but between changes in board members' professional affiliations, and difficulties in pulling together the group at a mutually convenient time, the Project had to resort to more informal contact with board members. The board members were carefully chosen to represent key areas of expertise. Unfortunately such key individuals are overscheduled and very difficult to pull together at one time for a meeting. However, we were able to benefit tremendously from the time they were able to give. Only one (Carnevale) did not attend any meetings. The board advisors were:

Prof. Uri Triesman, University of Texas, Director of the Dana Center;
Rick Miller, Assistant Superintendent, California Department of Education;
Jorge Ruiz de Velasco, Ph.D., J.D., Earl Warren Institute, UC Berkeley, Board Chair;
Dr. Maggie Carrillo-Mejia, Ex-superintendent Sacramento, Anaheim, Montebello USDs;
Dr. Anthony Carnevale, Director, Center on Labor and the Workforce, Georgetown University;

Kathleen Chavira, Senior Consultant, CA Senate Education Committee

We also decided after the project was underway to add an outside consultant, a “critical friend” in the form of David Goldstein, Ph.D., whom we recruited from the Lawrence Hall of Science at UC Berkeley. David is an expert in math/science education with many years of experience at the Lawrence Hall of Science, and elsewhere, and also with experience teaching and working in Latin America. He is fully bilingual. David was an enormous help to the project – always providing excellent critical advice in a way that made it very easy for the project team to accept his suggestions. We append his last internal report to this report (see Appendix A).

Study Methods

Study Design

We entered into the study with a pre-post cohort comparison design. The idea was to collect data on student grades, test scores, attitudes and aspirations at the first contact with the program, and then to annually assess change and growth in all of these areas. Criteria for admission to the SOL program were: (1) in 9th grade (or 10th if necessary and available) and eligible to take algebra and/or biology for the first time; (2) Spanish dominant; (3) with parental approval to participate in the program. “Eligibility” in our case meant that students were adequately prepared with prior schooling to take and pass the course, or “within striking distance” of being prepared such that if the school offered a pre-algebra or pre-science intensive preparation they could be expected to do the work. Counselors were to make this judgment with available information on the students. There was to be no attempt to accept only “good” students, and in all cases counselors were advised to accept students if they thought the student was willing to do the work regardless of prior grades. Students could be at different levels of English acquisition, but still dominant in Spanish and therefore could benefit from having lessons explained in their first language. The project was not directed to the long-term English learner who had long since stopped developing his or her Spanish language skills.

Comparison students were to be similar students (Spanish-dominant, generally level 1 or 2 on the CELDT²), 9th or 10th grade taking algebra and/or biology for first

² California English Language Development Test, used to assess all suspected English learners in the state, with 5 levels: Beginning, Early Intermediate, Intermediate, Early Advanced, and Advanced. At the early intermediate (level 2) level, students are characterized by oral and written production that is usually limited to phrases and memorized statements and questions. Frequent errors

time, and with similar test scores (to the extent that test scores were available) from a comparison school, and a second comparison group was to be selected from the prior year's 9th grade (and to the extent necessary 10th) classes with the same academic characteristics, in order to help control for differences between school contexts. All the selected schools agreed to provide data on the prior year's cohort and to assist in finding a comparison school that would cooperate with the study. Nonetheless, the whole notion of comparison students in the context of recent immigrants raises serious questions.

Which students are truly comparable and, are we even able to actually assess students adequately to know this? Many immigrant students have interrupted schooling, differing familiarity with English, very different prior schooling experiences. Most do not have test scores that can be used for placement purposes. Often counselors' assessments are "best guesses" if the student is adequately prepared to take a course, and for this reason the standard procedure in many schools is to place immigrant students back at least one grade. The comparison schools helped us to identify "similar" students but this definition also differed by school and counselor, and without comparable data or knowledge of prior schooling experiences in many cases, we simply cannot know how comparable the comparison students were. (We do know that in at least one case the counselors only selected students who had made it to 12th grade, which makes them very different from most of our students.) Given that many students who were unprepared to undertake the coursework were placed in Project SOL classes because of budget cuts that forced schools to combine classes, it is also altogether possible that those students chosen to be comparable were in fact already performing at higher levels than many of the SOL students.

Moreover, we had significant turnover in counselors and school staff during this project period, owing to the massive budget cuts. For comparison schools especially, helping us to gather student data for a project they were not involved in was not a very high priority. With very large numbers of students, such as in national data sets, some of the variation may wash out, but with the more modest numbers we had, variation in the selection of comparison students can affect outcome analyses significantly. This is an important limitation of this aspect of the study design, and it also affected the prior years cohorts. The same turnover in counseling staff both reduced the time and the motivation for short-term counselors to dedicate effort to searching through old files to find students who had begun at their school years before. Thus our study met with the real world problems of schools under enormous pressures and very limited resources.

reduce their communication results.

Anticipated outcomes

The goals of Project SOL were:

1. Fundamentally to increase the numbers of students who would have access to college preparatory (A-G) curriculum and who would be able to pass these classes, in comparison with similar students who had not experienced Project SOL.
2. Secondly, to increase the graduation rate among SOL students in comparison to non-SOL students, and to prepare the SOL students to have the option of going to college.
3. We were also hoping to see increased desire to complete the high school diploma, increased interest in core subject areas and in the use of technology, especially computers, to support learning, and increased desire to continue studies beyond high school. In the case of these outcomes, SOL students would serve as their own “controls”, hopefully showing growth and change over time. Surveys and interviews with students would be the primary way in which we would attempt to discern any impact of the program on these changes.
4. With respect to parents, we hoped to find increased “college knowledge” and increased understanding of how to support their children through pre/post testing of parents attending the supplemental parent education program. We found, however, that parent data were largely unreliable. Many parents did not read, or had difficulty understanding the questions, also many parents marked all items at the highest level from the very beginning, not allowing for a measurement of growth. We interpreted this to mean that parents were anxious to “please” the investigators with overly positive responses. Finally, there was considerable unevenness in attendance at parent sessions so that there were relatively few matching pre and post tests. In the end, these data were not of great use in assessing the effectiveness of the program, though we did hear from teachers on this subject.
5. For teachers and counselors, we hoped to see an increased level of comfort and confidence with teaching and guiding immigrant students toward higher academic aspirations, and increased skill in using technology in their classrooms. Given that all teachers were supposed to be “skilled and experienced” at the beginning, it was hoped that positive changes could be at least *associated* with participation in the project.

Evaluation Plan

Overall Program Objective

The overall program objective was to increase the capacity of school personnel to meet the academic needs of Spanish-dominant students in preparing them for high school graduation and postsecondary education.

Student Goals

The objectives for students were that they would have access to A-G courses in a language and format that they could understand while they increased their skill in English, with a particular emphasis on English writing. It was also anticipated that students would feel more engaged with school and more hopeful about their future educational and occupational options.

Table 1. Primary Student Goals

Goal	Outcome Measures	Evaluation Design
Successfully complete courses in Algebra 1, Geometry, Algebra 2, Biology, Chemistry and/or Physics, and possibly Statistics and/or Economics in addition to English, History/Civics required for college preparation.	CST scores, MDTP algebra test (pre/post), GPA, sample of <i>Colegio</i> online quizzes specified by SOL	Compare course completion, CST scores, GPA with “control” of similar students in similar schools in the district or region. Compare prior two years & comparison schools
Increase content area vocabulary and other academic language skills in English; Demonstrate capacity and confidence in English writing	CST scores Growth on WRITE rubric Student self-report on survey, pre-post	
Increase A-G course credit	Compare to students in the prior 2 years	

Table 2. Additional Goals Associated with Student Objectives

Goal	Outcome Measures	Evaluation Design
Increase attendance	School records	Compare these outcomes to control group
Increase graduation rate	School records	
Decrease drop out	School records	
Increase college matriculation	School records	
Increase ability to learn in computer environment	Self-report on survey, observations	Pre-post survey of participants only
Improve engagement and higher education/occupational aspirations	Self-report on survey	Participant only, pre-post

Teacher Goals

Participating teachers will increase their capacity to instruct EL students in core subjects in Spanish, to use online curriculum, and to integrate writing instruction in English and Spanish.

Table 3. Primary Teacher Goals

Goal	Outcome Measures	Evaluation Design
Teachers demonstrate ability to integrate US & Mexican curricula	Observation protocol (pre-post), evaluation of 8 teacher lessons	Demonstrate ability to integrate curricula & some observations
Teachers have greater comfort using online resources and guiding students in use of computer-based curriculum	Teacher and student periodic surveys re: comfort with computer-based instruction, classroom observation protocols	Pre-implementation survey, annual surveys thereafter, bi-weekly observations to include <i>Colegio</i> curriculum used to augment standard instruction and use of school and other online materials
Teachers incorporate writing instruction in content lesson	Observation protocol (pre-post), student surveys re: writing in Spanish and English	Periodic observations, student surveys (beginning & end of year)

In addition to instructional/pedagogical goals, the Project assumes that other goals related to teachers' sense of efficacy, competence, and hopefulness for their students will be realized:

Table 4. Associated Teacher Goals

Goal	Outcome Measures	Evaluation Design
Increase teacher job satisfaction	Teacher survey, teacher turnover, participation in professional development	Pre-post teacher survey, exit interviews, annual surveys of attitudes re: teaching
Increase teacher professional self-confidence	Teacher survey	Pre-post teacher survey, exit interviews w/teachers, annual surveys of teacher attitudes re: teaching
Increase teacher hopefulness about students' educational and occupational options	Teacher survey	Annual teacher surveys

Counselor Goals

Counselors will develop skills in closely monitoring students and reading student data to inform counseling decisions. Counselors will learn skills in connecting to parents through PIQE lessons, and attitudes toward students' future options will change.

Table 5. Primary Counseling Goals

Goal	Outcome Measures	Evaluation Design
Counselors will assign appropriate students to SOL classes & compose classes	Full complement of courses scheduled with correctly assigned students	Full complement of courses and students
Counselors will enhance skills for reaching out to parents	Pre-post survey, observation, interview	Counselor survey, interview
SOL counselors will be more optimistic about students' abilities and future options	Counselor survey	Pre-post survey administration

Student Recruitment

We had selected four high schools to participate, and anticipated having a minimum of 30 students from each school taking both algebra and biology in the 9th (and to some extent the 10th) grade, for a total of approximately 120 students in the first semester of the first year, with similar numbers of comparison students

at other schools, and from the prior year's 9th grade cohort at the same school. We intended to take all students who met our criteria on a first come first served basis up to the capacity of the schools to admit the students. Following the cohort model, we intended to bring on a second freshman cohort of about 120 students in the second year, while the first year's students moved on to geometry and possibly chemistry or earth science. This would then have meant a maximum of about 240 students by the second and third years, considering attrition. And we would not take on more students during the third and final year of the study. See Table 6.

Table 6. Student Recruitment Design

	Year One 2008-09	Year Two 2009-10	Year Three 2010-11	Year Four 2011-12
Cohort 1	Minimum 30 9 th (possibly 10 th) graders in Algebra I and Biology	Minimum 25 10 th graders in Geometry and Science course	20-30 11 th graders in Algebra 2 and Chemistry, possibly Physics	This year was added after the project was underway
Cohort 2	N/A	Approx. 30 9 th graders in Algebra I and Biology	20-30 10 th graders in Geometry and Science	No longer cohort model
Total Per Site	Approx. 30 students	55 - 60 students	40-60 students	
Total All Sites	Minimum 120 students	220 – 240 (including attrition)	160–240 students (including attrition)	451 students (cumulative)

It turned out that we were able to stretch our funds to cover a fourth year of the project and all of the schools indicated a strong desire to continue the program and to continue taking students. Thus, in the end, we enrolled 451 students and provided almost 1,000 course enrollments in Algebra I, Geometry, Algebra II, Biology, Earth Science, Chemistry, and Physics. However, almost immediately upon implementation of the program, the cohort design broke down. Ultimately the project adopted the notion of “service as needed,” providing courses for students who needed and wanted to take a Project SOL course, at whatever grade they were enrolled. Later, we describe how many students took each course and we discuss how the implementation came to deviate considerably from the initial design.

Data Collection

Data were collected at regular intervals, and at least annually, on teachers, counselors, students, parents, and administrators. For teachers and counselors, we gave annual surveys of attitudes and beliefs as well as comfort level teaching in the program, language use and use of technology, but we also conducted periodic interviews and did extensive video-taped observation of the classrooms and lessons. For students, we conducted annual surveys of attitudes, aspirations, likes and dislikes of school subjects, use of technology and peer, teacher and counselor relations. In addition to these surveys, we conducted formal and informal interviews and observations, as well as collecting data on test scores, grades, persistence, and college going. We annually surveyed and interviewed the administrators on their assessment of the program strengths and weaknesses. For parents, we conducted annual surveys of high school graduation and “college knowledge,” aspirations for their children, and student support practices, although these data are largely cross-sectional as we had different parents participating each year. Data for all other groups were both cross-sectional and longitudinal. In a later section we describe the survey and outcomes data. Data were collected by the Project team, in cooperation with the counselor and administrators at the schools.

Site Selection

We had initially proposed to select three sites in three different school districts for geographic and contextual variation, but were convinced by one of our funders to take a fourth site in the Los Angeles Unified School District, if at all possible (as this funder was especially engaged in this district). The Imperial Valley school was proposed as a possible site because they had prior experience in a University of California venture with the Mexican Secretariat of Education and had, in fact, participated in aligning the online Spanish curriculum with California standards. We felt that we could benefit from the considerable knowledge and experience they already had with the curriculum, although they had not actually used the curriculum with their students. The second site in San Diego, California, was selected because it represented an important area of heavy immigrant concentration and was nominated by our Mexican partners at the Institute for Mexicans Abroad, and office of the Secretary of Foreign Relations. The third site was nominated by individuals knowledgeable of schools providing strong programs for immigrants in the Southern California area, believing it would be a very cooperative partner, and the fourth school was proposed as a high immigrant enrolling school in the Los Angeles district. In each case, we met with School Board members, principals and superintendents to present our proposal and gain

the district and the school's cooperation. In all cases, the schools were forthcoming and agreed to meet the following criteria for inclusion in the study:

- A. Willingness to devote four professional development days to the project each year.
- B. Ability to identify at least one bilingual teacher as a lead teacher and at least one additional teacher for each additional subject to be taught (e.g., bilingual lead teacher teaches algebra, plus one teacher for biology) who would be paid modest stipends for their participation.
- C. Ability to ensure that we would have at least one class of students each year in the project (with a minimum of 25-30). All things being equal, more students would make the site more competitive.
- D. A receptive and collaborative principal to help facilitate the program.
- E. Sufficient computers, software and Internet access to allow an entire class of students to participate on computers simultaneously.

The Sites

We began the project with four schools in four Southern California districts: Brawley (Imperial Valley), Chula Vista (outside San Diego), Baldwin Park (an outlying suburb of Los Angeles) and Benjamin Franklin in Los Angeles. We had initially considered selecting sites in northern California and even outside the state (e.g., Texas), but the costs were simply too high, so we chose four sites in the quite different areas of the broad Southern California region. Los Angeles was a natural choice, given its size and importance, and the district was very anxious to have a demonstration site; Chula Vista was strongly recommended to us by our Mexican partners, who already had developed strong relationships in the district; Brawley was involved in the alignment work that recently had been done and so was selected because of the school's deep familiarity with the project and their desire to participate; and Baldwin Park was recommended by knowledgeable people in the field. However, unlike the first three sites, the Baldwin Park site was never able to actually implement, after nearly a year of providing intensive support. We had to make the difficult decision at the end of year one to withdraw from Baldwin Park. Because reliable data were never collected at Baldwin Park High School, we do not consider it an implementation site and therefore do not provide any further information about the school.

The next difficult decision was whether to take on a new school one year into a three year project, in which we would have little time to collect outcome data on

the students and to bring the program up to speed. Because one of our graduate student researchers, Marco Diaz, knew teachers from another LAUSD high school and they expressed interest in participating, we decided to try to bring on the Sylmar High School in year two. This turned out to be an excellent decision; Sylmar became a very effective implementer with strong administrative support and some outstanding teachers. In fact, we were ultimately able to achieve a higher level of implementation at Sylmar than at any other school.

Brawley High School

Brawley High School is located in the city of Brawley in the Imperial Valley of California. The area is largely agricultural, with alfalfa being the number one crop, most of which is exported to Asia. Onions, lettuce, carrots, and sugar beets are grown as well. Many families own land and their children pursue careers in the family business, going to college for degrees in agribusiness. There is also a significant population of migrant students whose families follow the crops. In recent years, there has been a push for the development of renewable solar energy, with many companies interested in harnessing the heat in the region.

In the 2011-12 academic year, the school's enrollment was 1,622 students. Eighty-five percent identified as Hispanic, and sixty-three percent of students qualified for the Federal Free and Reduced Price Lunch Program (FRL). Three hundred ten students, almost 20 percent of the student population, were designated as English Learners and 99.4 percent spoke Spanish as their primary language. The services provided for English Language Learners included English Language Development, Specially Designed Academic Instruction in English and content courses through primary language instruction. Brawley High School also reported 434 computers available for student use during the 2006-2007 school year and eighty-five classrooms with Internet.

Brawley High School operates on a traditional calendar and on a block schedule. The Title I school has also met its Annual Yearly Progress (AYP) goals and Annual Measurable Objectives (AMO) for the past six years up to the present. Brawley High School offers the federally funded Migrant Education Program for the twenty percent of its students identified as migrants. The Migrant Education Program provides supplementary instructional services, academic and personal counseling, required course and credit assistance (through the PASS program), emergency vision, dental and health referrals, involvement of the Parent Advisory Committee, and other supplementary services to enhance migrant student academic opportunities. The school recently received funds from the Measure T Bond, which they used to renovate the school.

The Brawley school community was described as very close, a place where everyone knows each other. As the counselor, put it, “we know our students.” The school was described as the number one place where new arrivals congregate, as the town has no newcomer welcome centers or other centers for new immigrants. In contrast to some of the other schools in Project SOL which students noted had issues with security and crime, Brawley was perceived as safe, clean, and a place where parents felt comfortable sending their children. Many of the students at Brawley continued to spend much of their time on the Mexican side of the border where many had family and friends, crossing over to Mexicali for the weekends.

The Border Patrol was and remains a daily presence in Brawley, where they are stationed along the freeways. Students were heavily recruited to work for the Border Patrol, as well as for the two nearby state correctional institutions. Latinas in particular were perceived as “very popular” for these well-paying positions.

Chula Vista High School

Chula Vista High School is an urban high school located on the west side of the city of Chula Vista within the greater San Diego area. The school’s enrollment was 2,698 students for the 2011-12 school year. Eighty-six percent of the students identified as Hispanic and almost forty-seven percent of students qualified for the FRL program. In the 2011-12 school year, Chula Vista designated 26.6 percent of the student population or 700 students as English Language Learners (98.7% Spanish-speaking). Almost thirty percent of the 9th and 10th grade students were designated as EL students, with these percentages tapering off to 20 in the 12th grade. Most students received “other” instructional services accordingly, with a little over 150 receiving English Language Development and Specially Designed Academic Instruction in English services. Chula Vista High school also reported 235 computers available for student use for the 2006-2007 school year, the last year for which data were available.

Chula Vista High School operates on a one-track year-round schedule, which it adopted mid-way through our implementation. The school houses Chula Vista's School for the Creative and Performing Arts (SCPA) as a school within a school for students in grades 7-12 at Chula Vista Middle School and Chula Vista High School. The SCPA offers professional instruction in art, dance, drama and music within the context of an otherwise traditional high school. The mariachi music program has been written up by the New York Times, and is a well-known training ground for mariachi musicians in the Southern California area. The marching band is often invited to perform in other parts of the country. Spanish is used throughout the campus, even among African American students. Because of this, speaking Spanish was said to be less of a marker at this school than it might be at others.

Less than 10 percent of the students were non-Hispanic white during the time we were in the school, and it was reported that the majority of them were in the magnet performing arts program. It also continues to be a school with a quite good reputation that we were told many families jockey to get into. The school has a history of which it is proud. At the time we initiated Project SOL, the principal was a former graduate of CVHS, some 45 years prior.

Benjamin Franklin High School

Benjamin Franklin High School is a large urban high school located in the exurban ring surrounding Los Angeles, in the area of Highland Park. It is about to celebrate its 100th anniversary, which has included some illustrious graduates over time. In 2011-12 its enrollment was 1,862 students. The high school is part of district 4 within the Los Angeles Unified School District. Ninety-one percent of students at Franklin identified as Hispanic and seventy-seven percent of students received FRL services. English Language Learners made up 24.9 percent of the school's population and comprised 587 students (2011-12). Recent data suggest that the graduation rate is about 75 percent, however some competing data show that it may be considerably lower. Ninety-three percent of the English Learners at this school speak Spanish and sixty-four percent of them are in grades 9 and 10. Over 500 of the English Language Learners at this school receive ELD and SDAIE. Over one hundred students receive instruction with primary language support. Although Spanish is clearly the predominant language spoken by Franklin's ELs, the school has more diversity within the Latino population than most others in Southern California. Many of the students are from Central American countries, especially El Salvador.

Franklin High School operates on a year round schedule with 3 tracks and is designated a Title I school. Students in 10th, 11th and 12th grade take classes within one of the following small learning communities: Academy of American Studies; Arroyo Seco; Business and Technology; Cultural Discoveries; Human and Health Services; Math and Science Magnet; Media & Graphic Arts; and Sports Science and Business. During their 9th grade year, students decide which SLC they will join the next year. In 2011 the school welcomed GEAR Up, Gaining Early Awareness and Readiness for Undergraduate Program, which will follow the ninth grade class of 2011, as they get ready for college. Franklin High School also reported 1056 computers available for student use, although our experience was that many did not actually work or were inaccessible.

Enrollment at Franklin has been declining in recent years. In 2009, the school enrolled over 2,500 students, and by 2011-12 enrollment had dropped to 1,862.

This was probably due in part to an overall decline in the high school population, a reduction in immigration (as this is an immigrant receiving area), and some gentrification of the neighborhood. However, many people commented on gang issues in the neighborhood and there may be some reluctance on the part of some parents to send their children to this school. On the other hand, the school supports a very successful academic decathlon team that recently won top honors statewide, and the school annually celebrates its graduates who go on to highly competitive colleges and universities.

Sylmar High School

Sylmar High School is located in a suburban community on the Northeastern outskirts of the sprawling Los Angeles basin. The campus is nestled in a quiet working class residential neighborhood that consists of predominantly small, single-family homes. The school population of 3485 students (in grades 9 through 12) is drawn from a community that was approximately 76 percent Hispanic/Latino as indicated by 2010 U.S. Census data. The school demographics, however, do not reflect well the demographic profile of the community. In 2010-2011 the student population was approximately 94 percent Latino, 2 percent African American, 2 percent non-Hispanic white, and less than 1 percent Asian. The school's report card shows that only 61 percent of its students graduate in four years. Sixty-nine percent of the students at Sylmar qualify for the FRL. Of the 3485 students approximately 24.6 percent are English Learners. Not surprisingly, 97.9 percent of the ELs at SHS are Spanish speaking. SHS reported providing the following services to their EL population: 51 percent receive ELD and Specially Designed Academic Instruction in English (SDAIE), 16.5 percent receive ELD and SDAIE with primary language support, and 6 percent receive ELD and academic subjects through the primary language.

Sylmar High School has consistently failed to meet its targets for academic improvement and so has been under threat of reconstitution. Its extreme overcrowding and heavy immigrant population have created challenges. The solution to the overcrowding has produced its own set of problems: a new school was built nearby to absorb some of the overflow students, but this also resulted in losing some of Sylmar's strongest teachers. In spite of its status as an underperforming school, our experience was that the school had strong and caring administrators and counselors and some outstanding bilingual teachers, especially in math and science where such teachers are normally rare. It is also notable that detailed information about the school is much more easily accessible at the school's website than is the case for most other LAUSD schools.

Teaching Staff

Although one of the chief requests we made of schools that wanted to participate in Project SOL was that they assign us teachers who actively wanted to participate (no foot draggers) in the program and who were skilled and experienced, this is not necessarily the profile of the teachers with whom we ended up working. For example, while Chula Vista had at first been considered a very strong site, it was ultimately only able to implement Algebra I because the second math teacher and the science teachers selected by the principal to participate simply refused to cooperate with the project. Evidently they felt it was too much work.

We had also specifically requested that principals select experienced teachers because we knew that incorporating a whole new curriculum in Spanish into their already established routines would be challenging for any teacher, but we worried that it might not be possible for a teacher just beginning to figure out how to teach. Principals all agreed to our request but simply were not able to deliver, and they assigned the teachers that were bilingual and who would, at least, not resist the assignment. As a result we had different levels of implementation: some teachers grew in their pedagogical and language skills noticeably over the period of the project, others started at a high level and maintained and even grew beyond this already high level, and a few fell by the wayside. Ironically, some of the strongest teachers were those that had entered with the least experience. In fact, by the end of the project, all of the remaining teachers would easily be considered highly expert teachers, and they were all bilingual. We return to a discussion of the teachers' growth later in the report.

Table 7 below shows the profiles of all the teachers who actually implemented the program. In addition to the eleven teachers listed in Table 7, three additional teachers participated in trainings during the first year but did not implement the program in their classrooms.

Table 7. SOL Teacher Information

Teacher	Years with SOL	SOL Classes Taught	Subject Credential	Years of Exp. Teaching in 2008/9	Undergrad Colleges, Year Graduated	Birthplace	Preferred Language
Octavio Alvarez	4	Algebra I	Math	4	San Diego State (Calexico), 2001	Mexico	Spanish
Sandra Olivar	4	Biology Earth Science	Biological Sciences	16	UABC Mexico, 2009	Mexico	Spanish
John DeJesus	4	Algebra I	Math	13	San Diego State, 1992	U.S.	English
Juan Calderón	4	Biology	Biology/ Chemistry	4	Cal. State Northridge 2004	El Salvador	Both
Ligia Estrada	4	Algebra I Geometry	Math (Algebra & Geometry)	5	Cal State LA, 2003	Mexico	English
Estela Donlucas	1	Algebra II	Math	16	Occidental College, 1994	U.S.	Both
César Fuentes	3	Algebra I Geometry	Math	3	Cal. State Northridge, 2006	El Salvador	English
Arleni López	3	Biology	Biology	11	Cal. State Northridge, 1999	Mexico	English
Veronica López	2	Chemistry	Biochemistry	3	Cal. State Northridge, 2007	U.S.	English
Angela Campbell	1	Physics	Chemistry/ Physics	16	Stanford, 1996	U.S.	English
John Castro	1	Biology	Biology/ Chemistry (intern)	2	UCLA, 2000	Colombia	Both

Counselors

Although we struggled to keep our SOL teachers and spent a good deal of time writing letters, meeting with administrators and school board members to lobby on behalf of retaining our teachers in the midst of a budget melt-down in California that was resulting in massive lay offs of teachers with many years of experience across the state, retaining the counselors was an even greater challenge. In only one school were we successful in keeping the same counselor for the entire period of the project. This was Brawley. We also saw how a long-time counselor in a school could command respect for his role and gain sufficient power and authority to protect the SOL project. New counselors, who had not established their reputation or authority, had difficulty defending the program from “poaching” of the computers or redirecting students to non-SOL classes, or cramming students into the SOL classes who did not speak Spanish or who were not prepared to undertake the work. The role of counselor was key to the integrity of the project. Counselors were charged with selecting students and composing classes for SOL students. In the schools with inconsistent counselors, we had inconsistent course assignments and often found that students who were not appropriate for the class were assigned to it “because it was the only class with unfilled seats.”

Chula Vista was especially hard hit by the turnover of counselors. The new young counselor who was in that position at the launch of the project was never able to maintain the integrity of the SOL classes because long-standing teachers overruled his decisions and the about-to-retire principal did not want to take on the challenges. Thus, our teachers, two of whom really weren’t committed to doing the project anyway, found themselves trying to teach classes composed of a variety of students, some of whom were SOL eligible and others not. One counselor, Ms. Grossman, who unfortunately lasted only one year in the position (because of budget cuts) was exceptionally strong and probably could have achieved a great deal if she had been allowed to remain. Unfortunately, she was quickly replaced.

On the other side of the coin was Brawley High School, which benefited from the consistent and authoritative counseling of Frank Felix. Mr. Felix was a well-known figure in the community and fully bilingual. The project experienced the fewest problems in selecting the right students, tracking and monitoring students, and maintaining the integrity of the classes under Mr. Felix’s authority. Of course, he also enjoyed the solid support of the principal.

Franklin High School underwent considerable turnover in counselors and had the predictable problems as a result. However, one counselor/ESL teacher took over

the position--mostly by insisting on it and in spite of being formally re-assigned--for about two and one half years. Ms. Garcia is not bilingual in Spanish/English nor is she Latina, and this was initially perceived as a major deficit given that the counselor is also charged with considerable parent contact in the SOL project. However, Ms. Garcia was such a strong supporter of the program and such a constant and energetic presence for the SOL students that she overcame any cultural/linguistic limitations she may have had. She became a major asset to Project SOL at Franklin High School.

Principals

Principal leadership, of course, is key to the success of any program in a school, and this was no less the case with Project SOL, even though it relied much more directly on its teachers and counselors to establish and maintain it. All principals were cooperative to one degree or another, as all, at the beginning, had volunteered to participate. However, as in any endeavor, there were different levels of interest, passion, and commitment, and different contexts in which all the schools were facing hugely significant challenges. The principal of Chula Vista High School was happy to invite Project SOL in and pledged his support and deep interest, but he was also counting the days until his retirement and simply did not want to take on anything difficult. Unfortunately, the teachers he had selected to participate in the program were not all enthusiastic and, for the most part, they simply dragged their feet and made excuses until it became evident that the project would not be implemented in their classrooms. Unfortunately, it was too late to choose another school or other teachers, especially without the strong support of the principal.

Franklin High School was led by a former graduate of the school and an individual who had himself been in the same shoes as the Spanish-speaking immigrants that the program hoped to support. Mr. López was passionately interested in the program and in the students and rose to the occasion whenever asked to do so. However, he was also overwhelmed with a myriad of challenges, including some teachers who were not serving these students well but who could not be easily transferred elsewhere. Mr. López was transferred to another school in the second year of the project, and he was replaced by an equally enthusiastic new principal, Mr. Nacorda, who was embattled by budget cuts and the loss of key faculty as well as factions vying to reorganize the school into a charter. Mr. Nacorda became one of 25 administrators to briefly lead the school over a decade of upheaval.

Sylmar High School had the same principal over the three years of the project and Ms. Lyons was a strong supporter of Project SOL, but given the size of the school she had to delegate direct responsibility for the project to others. The others who

were charged with overseeing the project were in all cases competent, well-meaning, and dedicated, but also in the midst of being reassigned to different duties because of the budget cuts the school and the district were experiencing. Nonetheless, with everyone doing their best, the administration of the project at Sylmar fared about as well as could be hoped.

Finally, Brawley High School was the most stable and consistent and had the same principal throughout the four years of the demonstration project, perhaps because there aren't a lot of options in a small rural town. But the consistency of leadership and the established relationships that school personnel could rely on were reflected in a well-run and supportive school environment. Brawley was not free of tensions or of the ravages of declining budgets, but it obviously benefited from the stability and was able to offer a welcoming environment to the students who attend the school

The Curriculum

Because the primary goal of the project was to make it possible for Spanish dominant students to take and pass rigorous, college preparatory courses in high school, knowing about the construction and the elements of the curriculum is important information.

Alignment

Alignment of the curriculum took form in two ways. The curriculum was first aligned by a group of US teachers, working together with Mexican teachers, to the sequence of courses that are taken by high school students in California. For example, Geometry and Algebra 2 did not exist as courses in the *Colegio* curriculum before Project SOL. These courses had to be created using pre-existing units from the Mexican curriculum at different grade levels as well as from U.S. courses. Earth Science was also created in similar fashion. There was no class in the *Colegio* curriculum equivalent to the Earth Science class before Project SOL.

The *Colegio* curriculum was then reviewed for alignment with California standards by staff from the University of California Office of the President (UCOP). California standards are covered by the curriculum but the curriculum does not necessarily cover the standards in the same order as textbooks from California, as the Mexican curriculum is more in line with international curricula that tend to be more integrated, introducing many math and science concepts in the earlier grades that we reserve for high school.

Coverage of specific areas

In general, topics covered by the *Colegio* curriculum include the basic components of each class as it is offered in California schools, but some additional topics are included because they are offered in the Mexican curriculum and are therefore optional for California students. For example, *Fasiculo* (Unit) 3 in Geometry covers non-Euclidean Geometries. None of the California Geometry teachers made use of this content. On the other hand, some teachers felt that there was not enough material in the Geometry curriculum and consequently relied on textbook resources to augment problem sets and activities. It is helpful to recall that in Mexico, as well as many other nations, geometry is not taught as a free-standing course, rather it is incorporated into a more integrated mathematics curriculum, more akin to the direction that the Common Core is taking. Both math and science teachers noted that there were areas of the curriculum that were not adequately covered and that they needed to go to auxiliary materials to supplement. This sometimes resulted in their not returning to the *Colegio* curriculum for those units. They also noted – as had the Project SOL team—that the curriculum was not interactive and did not take advantage of the potential of the technology. On the other hand, math teachers especially appreciated the applied nature of some of the Mexican curriculum and the real world examples they offered.

How useful did teachers find the SOL curriculum?

Through interviews and observations, the study team was able to assess the extent to which teachers used the SOL curriculum and the value they felt that the curriculum contributed to their teaching. We had initially requested that teachers use the curriculum in the classrooms at least 2 to 3 times per week, integrating it into their already-established lesson plans. As we observed teachers, and found that many dedicated all of Fridays to assessment and review, leaving only 4 days for new instruction, we reduced our request to 2 days per week (or about half of the instructional days). Thus, those who used it only once per week or less, were assessed as having low usage, and those who averaged twice a week were assessed as having medium usage. Below is the “average usefulness” across all teachers using the curriculum. Of course as an average, this represents both teachers who used it as we had requested as well as those who used it less:

Algebra 1 – was used moderately (1 to 2 times a week) and was generally assessed as adding low to medium value across the teachers using it.

Geometry -was also used moderately (1- 2 times a week) and, like algebra, it was assessed as adding low to medium value to the course.

Algebra 2 -was used less often, but was viewed as having medium to high added value and, in fact, in one case was used daily as the core curriculum.

Science, especially Earth Science, was used almost daily at Brawley and added medium to high value at Brawley High School; it had low to medium value at other sites and across the various courses—biology, chemistry, and physics.

The study team also evaluated the ways in which teachers used the *Colegio* online curriculum. Most teachers used it for lecture and to provide examples for students. Most also projected the website in their classrooms rather than having students individually work at computers, in part because access to individual computers continued to be a challenge at most school sites, even though this access had been part of the understanding at the outset of the project. About half of the teachers had students read aloud or assigned reading of the material regularly, either at individual computers or as it was projected.

Those teachers who had a class set of laptops, such as Mr. Fuentes at Sylmar, used the curriculum in a one-on-one manner more often. Mr. Fuentes also used a blended learning model where part of class time students were following a lecture based on the online materials and the other part of class time doing independent practice. A few teachers (Ms. Donlucas, Ms. Estrada) used printed versions of the online content for in-class work as well as homework assignments.

We had initially envisioned testing out the curriculum with non-bilingual teachers (and Spanish-speaking online teacher support), however this never came to fruition. Either non-bilingual teachers failed to volunteer or principals feared they could not manage it, so we had no monolingual English speaking teachers in the project. In many cases, the teachers that became Project SOL teachers were the only bilingual teachers in that particular department (e.g. Ms. Villegas at CVHS, Mr. Fuentes at SHS, Mr. Alvarez and Ms. Olivar at BUHS). In other cases, when the only bilingual teacher that was available was not suitable, Project SOL had to eliminate the course offering.

While the evaluations *by teachers* of use and utility of the *Colegio* online curriculum are mixed and by no means overwhelming endorsements of the curriculum “as is,” it is important to bear in mind that the curriculum was a vehicle for creating a program of services – academic, personal, social, and familial—that were aimed at supporting the students through successful completion of high school and creating a pathway to college. In the Outcomes section, we address these goals and the variety of ways in which the program, teachers and counselors assisted students in meeting those goals.

Special Studies

We conducted four “special studies” within the larger Project SOL experiment to learn more about how the program could work, and how it did work in special circumstances. These included: (A) a study of the interaction of teachers’ Spanish competency and the use of the *Colegio* curriculum; (B) a study of a complete substitution of the Algebra II online curriculum with a “facilitating” teacher (a teacher who was not present all of the time); (C) use of distance online teachers from Mexico to complement instruction in Spanish; (D) and an experiment in providing distance learning through Project SOL, linking two participating schools.

A. Spanish language competency and use of SOL curriculum

One of our graduate student researchers, Lourdes Guerrero, was at the Ed.D. dissertation stage when she joined the project. Ms. Guerrero chose to study the Spanish language competency of SOL teachers as it related to their use and implementation of the SOL curriculum. It was immediately evident that some teachers used the SOL curriculum more than others, and Lourdes wondered if their enthusiasm for using the curriculum might be related to their comfort level with Spanish.

Method: Lourdes surveyed all of the SOL teachers who participated in the first year of the project (8) and asked them to rate their own proficiency in the four modalities of Spanish. She also interviewed the teachers about their use of and comfort level with Spanish in the classroom. She also asked them to rate their level of implementation of the SOL curriculum in the survey. In addition, she observed all of the teachers in their classrooms unannounced over several months to gain an insight into *how* they used the curriculum, whether it was as a free-standing exercise (show a lesson and have students do some kind of activity attached) or integrated into a larger lesson in which the SOL curriculum reinforced or introduced related concepts from the California English curriculum. She theorized that the most productive use of the curriculum was in an integrated form, and teachers who understood the Spanish curriculum better would be better able to integrate it into their ongoing lessons.

Findings: Lourdes was able to demonstrate, as she had hypothesized, that the teachers who had greater proficiency in Spanish were also much more likely to utilize the SOL curriculum more frequently and to incorporate the SOL curriculum in an integrated fashion into their lesson plans. This information was very helpful to the Project in answering two fundamental questions: Would we be able to use this curriculum effectively with teachers who did not have a command of Spanish? The answer to this, at least given the way we were expecting teachers to use it,

was probably no. Second, Could we expect teachers with less proficiency in Spanish to use the curriculum as frequently or in an integrated fashion without additional support? Again, the answer to this question was “no.” But it also alerted us to an issue to which we needed to pay particular attention: teachers with weaker Spanish will need some additional support in using the curriculum optimally, and the Project should consider providing more detailed explanations in English of the Spanish curriculum.

B. Algebra 2/Donlucas

While Algebra 1 is a gateway course to college preparatory work, Algebra 2 is a gateway course to college matriculation (i.e. getting into college). Algebra 2 is required to make application to the California State University system and the University of California. Thus, the great majority of Spanish-dominant students are closed out of public 4-year colleges and universities in California by their inability to access Algebra 2 and the lack of availability of teachers to teach the course to students who are not fluent in English. In an attempt to assess to what extent Algebra 2 could be offered completely online through the Mexican curriculum, using Mexican “*asesores*” (support teachers or tutors) online, we recruited Ms. DonLucas to teach the Algebra 2 class to 7 students that had successfully completed Algebra 1 and Geometry in the first two years of the project.

Because there were only 7 students scheduled to take the Spanish-language Algebra 2 course, Franklin High School could not provide a full time teacher for such a small number of students. (20 students is the minimum number for which a teacher can be allocated.) Given this circumstance, the original plan was for the principal, who had taught mathematics for several years, to teach the course. The principal could teach the class for one period 3 times a week and attend to his responsibilities as principal the other two days a week. Students would use the weekly *asesor* session once a week and then work independently one day a week.

One goal of the project was to see if the online format of the curriculum would translate into greater accessibility and greater student autonomy, so this was an important test of those goals. However, one month before the start of the semester the principal was reassigned to another school and the course was left without an instructor. Ms. DonLucas was recruited because of her experience as a math instructor and because she could also fill the role of a part-time instructor (and not have to allocate another full time teacher) while dealing with her full-time responsibilities as Magnet School Coordinator. Her position fit the plan to leverage the accessibility of the online format and lessen the burden on the school in terms of staffing.

Method: A Project SOL research assistant visited the Algebra 2 class visited 2-3 times per month over a one-year period. Four *asesores* sessions and one class meeting were videotaped. Planning and other curriculum materials were gathered at the end of the year. Ms. Donlucas was interviewed extensively. Two students were interviewed during the 2010-2011 school year, and four students were surveyed in the Fall term of 2011.

Student outcomes: Seven students enrolled in the Algebra 2 course at the start of the 2009-2010 school year. Out of the seven students, five were enrolled in Project SOL classes, (Algebra I and Geometry) for the two years prior to taking Algebra 2. Two of the seven students had been part of Project SOL for one year prior, starting with Geometry. Four of the original seven students completed Algebra 2, and three of these students were enrolled in Math Analysis at the start of the 2011-2012 school year. Two of the four completers received an A grade and two received a B grade in the course. All students surveyed said that in-class lessons from their teacher were the most helpful part of the Algebra II class. The survey showed that students studied at least twice a week for Algebra 2. Students said that they used the *Colegio* Curriculum one to two times a week outside of class time. Two of the students surveyed cited not having a computer at home as a reason for not logging into the *Colegio* curriculum outside of school time more than 1-2 times per week.

Of the four students who completed Algebra 2, two went on to community college, one was applying to the University of California, and one to the State University system. It is not known what postsecondary paths the three who did not complete the course took; however, in two of the cases students dropped Algebra 2 in order to take other courses they considered critical for high school graduation.

Teacher assessment of curriculum: Ms. DonLucas saw value in the *Colegio* curriculum because it is in Spanish and it has a more conceptual approach to mathematics. Furthermore she noted that the *Colegio* curriculum used many contextually based problems (e.g. *viveros, ingreso, cantidades en millas*), which supported student learning. While Ms. DonLucas taught most of the course in Spanish, the students increasingly asked for instruction in English, which she complied with as much as possible. It was clear, however, that students understood much better when using Spanish as the language of instruction. The final result was that instruction was bilingual. For example, Ms. DonLucas required that the students write notes in English when elaborating mathematical vocabulary even though the discussions were in Spanish.

Student assessment of curriculum: Students were very clear about viewing the *Colegio* curriculum as a resource that helped them learn math. The curriculum was cited as being a good way to review or to understand “more clearly” the math topics they were studying. At least two students surveyed made specific reference to language as an important factor in helping them to better understand math because it was in Spanish and because it helped them with the vocabulary of mathematics. Students also saw value in the *asesores* sessions because they were in Spanish in addition to these sessions being an additional space for them to “practice” and “develop” their understanding. Students felt that the *asesores* sessions could be made more helpful by increasing the interactive nature of the chat room by adding video and/or by adding a way to see graphics.

Overall assessment of the Algebra 2 experiment: It appears that for highly motivated students, the online Algebra 2 course could be an opportunity for students who are still Spanish-dominant to access a critical course for college preparation, even when the number of students is too small to compose an entire class. The ability to receive explanations of concepts in Spanish was clearly valued by students and teacher alike. The students’ grades appear to be the best evidence of the value of having the bilingual class. The *asesor* was an added and valued supplement, though the direct instruction by the teacher, using the curriculum, was the most highly valued aspect of the course. The experiment reinforced the importance of the classroom teacher, especially a bilingual teacher, but also points to creative ways in which an online curriculum can be used to **partially** supplant the teacher where teacher resources are stretched thin, and bilingual personnel are in short supply.

C. Distance Learning Chemistry Course

As we prepared for the 2010-2011 school year, the Project had a need for chemistry teachers at three of the four Project SOL sites. Franklin, Brawley Union and Chula Vista High School did not have chemistry teachers who were *willing* or *able* to utilize the *Colegio* curriculum. However, at Sylmar High School we had the option of working with one of three Spanish-speaking chemistry teachers.

By the end of the 2009-2010, the principal at Brawley HS asked us if there was any way we could provide an online chemistry course in Spanish for their Project SOL students. After some research into distance learning, we accepted the project. Before we moved forward, we were assured that our assigned chemistry teacher, Mr. John Castro at Sylmar High school, would be willing and able to teach not only the course at his school site, but also a distance learning class for Brawley High School. After discussing this arrangement with administrators at Sylmar and Brawley, they suggested Mr. Castro be listed as the teacher on record at both

Sylmar and Brawley for credentialing purposes and Ms. Sandra Olivar, our resident Project SOL science teacher at Brawley serve as the facilitator of the class at her site. (Ms. Olivar was especially excited at this prospect as she had been wanting to get her chemistry credential and this would help her prepare for the state exam.) We also asked each administration for the following: a variety of lab and technological resources and the same preparation periods for the teachers, which was no easy feat considering that the schools run on distinct class schedules (block vs. traditional 50 minute classes). We were relieved when each administration said they would support us in any of these or other requests. For example, the counselor at Brawley High School reviewed the international transcripts of all of the Project SOL students at their site in order to create a potential class list for the chemistry class.

One of our graduate student researchers took on the project as her own and reviewed various online programs that would allow Mr. Castro at Sylmar to teach both Brawley and Sylmar students from his classroom in real time with the addition of a few technological resources such as microphones, speakers and web cameras. We selected www.dimdim.com because it was a free web conferencing service that allowed teachers to video chat, share documents such as PowerPoint and Word docs, and share a computer white board and websites. In this manner, the chemistry teacher could teach his class at Sylmar and simultaneously allow Brawley students to view his lecture with the help of a projector, listen to his questions via the speakers, and ask questions utilizing the microphone. During each class, the Brawley science teacher would set up the technology in her classroom and facilitate the class. Our research assistant tested and simulated the web conferencing capabilities at both sites and created a handbook with directions and frequently asked questions for each teacher.

In addition to the administrator support and technological resources needed, the distance learning chemistry course would require a great deal of collaboration between the chemistry teacher of record and the teacher/facilitator who would supervise the students at Brawley. In order to meet the requirements for a college preparatory chemistry course, the distance chemistry course would need to include engaging chemistry labs and rigorous class assignments (in Spanish). Ms. Olivar was excited to supervise students and facilitate the class assignments including labs and, in fact, she agreed to teach the course during her school's tutorial period, which is not technically class time. Similarly, students could sign up take the chemistry course during their tutorial period, which meant they would have an extra course in their load.

A year-long plan for the chemistry class was developed integrating the *Colegio de Bachilleres* curriculum with the school chemistry textbooks/state standards. This

included mapping out the labs for each unit and identifying the resources needed (especially for those more difficult labs that required chemicals), creating assessment and grading policies, and establishing a weekly schedule which included 3 lectures, 1 assessment day, and 1 day of students working with Project SOL *asesores* (tutors from Mexico). The two teachers were encouraged to share emails and phone numbers so they could collaborate during the summer months and check in with the Project SOL research assistant if they needed other support or resources. Finally, Mr. Castro and Ms. Olivar agreed to check in one day a week during the school year during their shared common preparation period to discuss students' progress, assessments, and curriculum.

Unfortunately, the distance learning chemistry class never came to fruition. Just before school was to start, Mr. Castro was offered a job working abroad in the field of medicine and made the difficult decision to leave his teaching position at Sylmar High School and the distance learning chemistry class at Brawley. As noted earlier, it was difficult to find chemistry teachers that were willing or able to teach chemistry in Spanish utilizing the *Colegio de Bachilleres* curriculum, let alone take on the distance learning chemistry course. While Project SOL was able to replace Mr. Castro with Ms. Lopez, a bilingual teacher at Sylmar who would teach the Project SOL chemistry class, she did not feel she could also take on the distance learning chemistry class in her first year with the Project, and at the last moment.

The loss of the chemistry class left 17 students at Brawley without a Spanish speaking chemistry teacher. 14 students opted out of taking chemistry altogether, while three students took the course at their site with an English-only teacher who had a harsh reputation. Ms. Olivar tried to support these three students, but eventually, one student dropped the course early in the year, while the other two struggled to pass. This provides a real-life example of the resource that Spanish language/bilingual courses represented for students.

Overall assessment of the distance learning experiment: While the failure to be able to offer the class was a hard blow to everyone on the project, especially to the researcher who had devoted so much time to negotiating all the details to setting up such a class and even purchasing the equipment (which had to be returned), and to the students left without a class they had hoped to take, we believe that the class would have been successful. Not without challenges, but we had been able to address all of the elements necessary to set up a distance class and had enthusiastic and flexible partners at both schools. We think it is worth considering such collaborations in the future in order to extend the reach of bilingual classes and specialized bilingual teachers.

D. Online Tutors/Asesores

The Mexican Secretary of Education (*Secretaria de Educación Pública*), through its office of preparatory education (*Colegio de Bachilleres*), with whom we were partnering around the *Colegio/SOL* curriculum, offered to provide experienced teachers who could lend Spanish-language support to students using the *Colegio* curriculum online through a chat room once weekly. This service was offered at a very modest price and it seemed to us that it would provide an important complement to our SOL classes and would potentially open the door to using the curriculum with English speaking teachers, if it proved successful with the students. Thus we made various attempts to implement the *asesores* component of Project SOL. During the summer of 2009, the Project SOL staff encouraged the teachers to utilize the option and created a handout that explained how to navigate it. We set up a schedule for use, negotiated this with our Mexican partners, and the schools received a schedule of times when the *asesores* would be available.

Early in the 2009-2010 school year, the Project SOL teachers at Brawley attempted to use the *asesor* program. The counselor, Mr. Frank Felix, assisted teachers, Alvarez and Olivar, to take Project SOL students to their school computer lab in order to chat with *asesores* and receive help during a tutorial period embedded within the school day. Their first attempts were hindered by their lack of familiarity with the *Colegio de Bachilleres* website. For example, neither the students nor the teachers could find the chat room icon and instead utilized the “*preguntale a un profesor*” [“ask a teacher”] option, which allowed them to leave a question that might be answered with one to two days. This was less than satisfying to the students. By the time they got an answer, they were onto another set of lessons.

After the Project SOL research assistants met with the Brawley team to simulate on computers how a student would access the *asesores*, the teachers and counselor were able to do so with ease. However, the *asesores* were not always available to work with students when they checked in. And, the *asesores* complained that there were times they were online that no one showed up. Ms. Olivar’s students utilized the *asesores* a couple of times with success, but it was also discovered that students needed to be carefully supervised during these exchanges as some students took the opportunity to behave badly with the *asesores*, which put a damper on the experience for all involved.

At the Project SOL mid-year check-in meeting, the teachers suggested that the tutoring be moved to afterschool to facilitate more use of the *asesor* option. In

the spring of 2010, the teachers at Brawley High School decided the *asesores* option was not a good one for their students. In particular, the teachers explained that their rural location meant most of their students could not stay afterschool to chat with *asesores*. Additionally, the math teacher already held tutoring sessions for his students once a week to prepare for the high school exit exam (CAHSEE) and was not willing to stay another day afterschool to supervise the Project SOL *asesor* tutoring.

At Franklin High School, the counselor worked with teachers to identify students that needed extra assistance in their studies and require them to attend the *asesor* sessions. Unfortunately, the students were never able to access the *asesores*. At Franklin, there was a lack of access to computers for students to use as well as a lack of trained staff to supervise the students during *asesores* sessions afterschool. Eventually, the counselor took it upon herself to identify the students who would benefit from *asesor* tutoring, pick them up from their last class and take them to tutoring twice a week. However, there were problems with the scheduling of the *asesores*, who were not consistently present, which frustrated the students and the counselor. There were also problems gaining access to the computer room regularly. Eventually, the teachers and counselors at Franklin decided that Ms. Estrada, the Project SOL math teacher, would provide tutoring in her classroom afterschool.

The most successful use of the *asesor* program was with the Algebra 2 class lead by Ms. Donlucas. This was probably due in part to the fact that the *asesores* were effectively built into the course design and both teacher and students relied on this component to achieve their goals for the class. One challenge, nonetheless, was aligning topics in advance, so that *asesores* would be prepared to cover material that the students were studying. This meant that Ms. Donlucas either had to stay very close to her pacing plans or find a flexible way to use the *asesor* when she varied from her pacing plan, which she did. The Algebra 2 class also built more of a relationship with the *asesor* than did the other classes and students took it upon themselves to “friend” the *asesor* on Facebook. Ms. Donlucas saw that this helped students get to know the *asesor* as a person beyond just the chat room, which facilitated their communication. After the first couple months of experimenting with the use of the *asesor*, the class developed a fairly successful rhythm, and the program was deemed quite successful.

Overall assessment of the *asesor* program: One of the themes in the teacher exit interviews was that the teachers really wished the tutors had been available, and when the program worked, they did seem to provide benefit for the students. For example, the Algebra 2 students and teacher gave it relatively high marks, but it had also been somewhat more consistent for them. Consistent availability of the

computer room was one problem. In some schools, there was weekly negotiation over who got to use the room, which made scheduling ahead very challenging. We also found that coordination of dates and times with Mexico was a problem. For example, Thursday afternoons may have been assigned as the day for the *asesores*, but we were not always aware when this was a holiday in Mexico, and vice versa. It was also difficult to notify partners in advance when there was a shortened day, or an afterschool event. The change from Daylight Savings to standard time does not occur at the same time in Mexico and the US; this caused problems more than once. After just a couple of times going online and preparing to participate, but having no one at the other end, both sides got frustrated and teachers especially complained that it was difficult to motivate the students to stay after school when they had experienced this more than once.

Thus, the primary problem with the *asesor* program was scheduling challenges, which could probably be overcome on a school-by-school basis, with a point person in charge. We, however, were trying to schedule for four schools with different schedules and unforeseen events complicating their schedules. In sum, we think the *asesor* program could be an important supplement for students, but it requires careful attention to scheduling, someone who can be in charge of this, and who can communicate with partners in Mexico in a timely fashion, at each site where the program is instituted.

IV. Program Implementation Challenges

Much was accomplished and much was learned in the four-year implementation of Project SOL. On the whole, it was an extraordinary experience with exceptional cooperation from schools, districts, teachers, counselors, and administrators. However, Project SOL also existed in the real world of high schools that serve the most vulnerable and disadvantaged children in our society, often with inadequate resources and extreme challenges. In fact, over the four years, we think we experienced just about every major challenge that our public schools can conceivably face, in addition to challenges experienced by our Mexican partners. Each one of these affected our ability to implement the project as fully and with the integrity we had envisioned. But we also learned a great deal about how to “roll with the punches” and keep on going, and how to manage these challenging situations. It is important to detail these hurdles so that others attempting to implement a program like Project SOL – and we hope that many others will do so – might anticipate some of the potential roadblocks they may encounter and prepare for them.

Severe Economic Downturn & Anti-Immigrant Backlash

The Project SOL team encountered a number of technical challenges in implementing the program, some of which were predictable, others less so, but the economic downturn in the US, which hit California especially hard, and the accompanying anti-immigrant backlash were monumental. The Great Recession that began about the time we were launching the project and that worsened during most of the lifetime of Project SOL had devastating effects on schools in the state, and especially in the schools we collaborated with as they had the fewest reserves to call on. Moreover, as is always the case when the economy turns bad, people are quick to blame immigrants for taking jobs and placing burdens on the schools and other social services, notwithstanding evidence to the contrary. Thus, each year we battled to hold onto teachers and counselors that we had trained, each year we had to ask principals to go out on a limb defending the program, and each year we lost more and more students to the reality that their parents had lost their jobs and had to relocate. The Imperial Valley, where one of our schools was located, was deemed the hardest hit area economically in the entire nation by the national press.

The tangible consequences at the school sites were many: 1) computer technicians were laid off and so broken computing systems remained broken and our students lost access to the promised computers; 2) new computers could not be bought; and 3) class sizes expanded dramatically – up to 45 students in a classroom—and SOL classrooms could no longer be protected from encroachment by students who did not meet the criteria, or even speak Spanish, but needed to be placed in *some* class. This created an impossible situation for many of our teachers, and a vexing problem for data collection. The normal movement of counseling and administrative personnel from one campus to another was accelerated by layoffs, and we had to deal with musical chairs at all levels of the school staffing. School personnel were understandably looking for any program to cut that might be receiving favored treatment, like protection of teachers or counselors, or access to computers.

One of our key teachers, a young Latino biology/chemistry teacher at Sylmar High School, after having experienced two consecutive years of “pink slips” indicating he was on the list to be laid off, decided to take a better paying, more stable job in the medical industry. This meant that we lost the teacher who was going to provide SOL chemistry to two of our schools. He was not replaceable.

On one visit to Chula Vista High School we had to walk around the border patrol truck parked on the front steps of the school – a chilling vision for parents who might have someone in the family without proper papers, even if the student was

born in the U.S. And, coming and going to Brawley High School meant enduring long lines of multiple border control checks in the area, signaling the near hysteria about “illegal immigrants.” This, on top of a failing economy, had to affect the local immigrant population. Immigration pretty much stopped to the area in Los Angeles where Franklin High School is located, and we had precipitously declining numbers of students to fill the SOL classrooms.

Our project took place in the worst economic times in 70 years, and it hit hardest the communities that we were trying to serve. Hopefully, the nation will not experience such an economic crisis again, at least not for a long time, because there is little that can be done in the face of such a calamity. However, migration is cyclical, it is international in scope, and it is a phenomenon that will not disappear as long as there are better opportunities in some places than in others, and as long as workers are needed to keep the economy strong. As a nation, we will continue to need better ways to educate the children of immigration, and so programs such as Project SOL and the collaborative ties that they engender should continue to be a feature on the educational landscape. We argue that, for this reason, they need to be supported even through periods of lower demand.

Life Transitions of Faculty

In addition to the external context in which the project was implemented, we lost many faculty, at least for periods of time, to a perhaps predictable situation (that we had not initially considered): several of our teachers and counselors had babies! This meant that they needed to be replaced, usually for one semester or less, but since they were highly trained to deliver a particular curriculum, in Spanish, we could not just insert a substitute. This resulted in uneven implementation in some classrooms and loss of critical counseling staff in some cases.

Selecting Partner Schools

We have described above the process we used to select schools to participate in Project SOL. In each case, it required that we follow up with nominations, meet with superintendents, school board members, and principals to gain their interest and approval, and in all cases this was a time-consuming, and often delicate, process. Even after having secured the cooperation of all levels of administration, key to making the project work was gaining the cooperation of teachers and counselors. This could not be assured just because the principal said it would be so. Because we were asking teachers to do something they had never done, with people they did not know, in a language most had not formerly used in the classroom except very informally and occasionally, it was critical that teachers and counselors understand the commitment and agree to it without reservation.

One school, Baldwin Park High School, proved to be a costly mistake. Although the principal expressed a strong desire to participate and ensured us that he could meet all of the criteria for participation, shortly after signing on to the project, he changed SOL teachers and appointed a new counselor, all of whom were brand new to the school and to their positions. We worried a great deal about this, but we were weeks from launching the project and it was too late to seek out another site. We hoped for the best. Despite our best efforts, the teachers at this site were actually very resistant to implementing the curriculum and avoided our researchers when they came to observe. Over and over the researchers were told “students were having a test today,” so it wasn’t convenient to observe in spite of the fact that prior to each visit, our researchers had contacted the teachers to ensure they could visit the classroom. By mid-year neither of these teachers had attempted to implement the curriculum more than once or twice. Each time we contacted the counselor about monitoring students, she contended that she did not have time to follow up on students who were failing because of her other duties. By spring of 2009 it was clear that our efforts and expenditures had been wasted and we had to withdraw from the school.

A second school, Chula Vista High School, proved not as disastrous, but nonetheless disappointing. Similar to Baldwin Park, the principal exhibited enthusiasm for the project, promised to meet all criteria for participation and immediately identified key teachers to teach in the program. However, the biology teacher very reluctantly attended some professional development sessions, but missed most, and had not used the curriculum when our researchers visited to check on progress. After two years of promises to implement, but with no apparent progress toward that goal, it became clear that the teacher was not ever going to implement. The principal could not find an adequate replacement, and so we had to conclude that SOL biology, and other sciences, would not be taught at Chula Vista. Similarly, when the principal assigned a second math teacher to take over the Geometry class, the teacher dragged his feet and found excuses not to attend professional development sessions, and never used the curriculum. The principal was similarly frustrated, but unable to identify a replacement. This school also experienced a new counselor every year, and sometimes replacements at mid-year, so that selection and scheduling of students was an ongoing problem. In the end, Mr. DeJesus taught SOL algebra every year and was an outstanding teacher, with adept use of technology and a growing confidence in his own use of Spanish. The curriculum, in his hands, was well executed and Chula Vista students were able to count on having at least one college preparatory math class for its Spanish-dominant students.

Probably being able to spend more time with teachers and counselors in these schools, one-on-one, away from the principal, and in a comfortable and informal setting would have allowed us to discern that these teachers and counselors did not really want to participate in the project, for whatever reasons. We were very clear with principals that we only wanted teachers who actively volunteered to participate—not those who could be drafted—because we knew it would require a commitment on their part that went well beyond the norm. But, either the faculty did not feel they could tell the principal they didn't want to participate, or the principal did not hear them. In recruiting teachers and counselors in a future experiment, we would take much more time to really ensure that the faculty were willing and enthusiastic partners, and we would not bring a site on until this was very clear. Of course this also means that there has to be much more lead time to identify partner schools and partner faculty than is normally available on a grant's timeline.

Challenges with our Mexican partners

Coordinating a bi-national project with so many components and participants, such as Project SOL, requires an extremely high level of coordination and flexibility. We relied on strong working relationships with our partners in Mexico to be able to provide the *Colegio de Bachilleres* curriculum, and to facilitate other aspects of the program, such as the online tutors. When communication faltered, we had breakdowns in the access to the curriculum through missing or incorrect passwords, breakdowns in scheduling tutors, and problems of inaccurate accounting of services provided. At one point we had a several months' stalemate because the *Colegio* refused to accept payment in any form that we could reasonably make it from abroad. They had insisted on a type of bank transfer that the University was unable to do.

Although the *Colegio de Bachilleres* was seemingly a willing partner in the project, and the Secretary of Foreign Relations (SRE) saw this as a very important binational project, for internal reasons the *Colegio* did not always place a high priority on the project. Every time we needed to discuss an issue related to communication breakdowns there seemed to be a different person in charge. Many of the positions within the Secretaría de Educación Pública (SEP) are political appointments, and as such, can change rapidly with consequences all the way down the line.

In 2011 *Colegio de Bachilleres* experienced extensive budget cuts and subsequent internal changes, including organizational restructuring, personnel turnover, the loss of about 50% of their staff, and programmatic overhauls. A new director was installed effective February 1, 2011, and she brought with her new staff, including

a new director for the unit that was our primary contact at the *Colegio*. In September our primary contact was laid off. Two of the *Colegio* offices converged, and in the process the size was reduced to about half of what it previously was. At the same time, the online curriculum provider was being replaced and future online access to the curriculum was unclear (though it did ultimately remain available).

Project SOL was operating in cooperation with the SRE, which has significant political weight, and the SRE would set up appointments and help us to negotiate the bureaucracy of the SEP, but this also created a layered relationship that did not necessarily forge close bonds between us and the *Colegio*, especially given the shifting nature of the *Colegio* personnel. The fact that the Project SOL staff is all bilingual, the PI holds dual citizenship (US/Mexico) and maintains a presence in Mexico should have helped to smooth relationships, but it is difficult to know to what extent it did.

In sum, cross-national and cross-institutional business relationships are even more complex than we had envisioned at the outset. Simply understanding the national culture and language may not be sufficient. The interests of the academy and the US policy world to better understand how to serve the immigrant population in the U.S. are not necessarily the same as those of a large (mammoth) bureaucracy in another country. Recent experiences with university-based partners in Mexico around a similar project have brought into sharp focus the differences in cultures between the Mexican academy and Mexican bureaucracies (just as they are similarly different in the US). This relationship has been much easier to navigate with no evident stumbling blocks. Perhaps the lesson is that relations between institutions across borders are best forged between institutions with similar internal cultures.

Technology Issues

Implementing an online curriculum in U.S. schools via a Mexican provider has presented us with a number of ongoing technological issues that we have had to address. While a requirement for participating in Project SOL was that the schools have adequate technology infrastructure, we nonetheless found that at times teachers had difficulty gaining access to the computer labs at the desired times, that district internet controls and pop-up blockers complicated accessing the course materials online, and that server problems occurred periodically for which nothing could be done in the short term. Layoffs at the school sites reduced the working hours available to maintain computers, and we had problems of computer breakdowns and inability to access personnel to help with these. We were able to mitigate these issues to some extent by making sure that as complications arose and were resolved at one school, these solutions were shared with our teachers and counselors at the other schools. We developed a tips and trouble-shooting guidelines document for all of our teachers that helped to increase teachers' ability to prevent and troubleshoot technological issues. Nonetheless, issues with technology at the schools were ongoing and resulted in at least one science class not being offered because of a lack of operating computers.

At one high school we were promised laptop computers for each *Colegio* biology student beginning with the first day of the project launch at the school. Two years later, we were still looking for the laptops and the district was unable to account for them, although they showed receipts that they had been purchased. Access to sufficient, working computers was an issue in every school. Our experience has taught us that a technology-based program offered in low-income schools must have back up plans for when the technology is either unavailable or not working. Some of our teachers began to gravitate toward using projectors to display the curriculum to the whole class from one laptop. This, of course, limits the usability of the curriculum in one-on-one or out-of-class contexts, but did still make it possible for students to participate in Project SOL.

Firewalls and other Internet problems were also a frequent issue with the technology infrastructure in the schools. These problems might have been minor if we had had good technical support at the school sites, but as noted above, schools were in the process of cutting back and laying off their technical support staff in the face of budget cuts, so these problems were sometimes virtually insurmountable. Teachers sometimes became so frustrated with the technology problems that it was difficult to sell them on the idea of using online curricula. Our experience certainly has notable implications for a state that is readying itself to go to completely online assessment in the next couple of years.

Online Tutoring

We have discussed the online tutoring above in the context of the Algebra 2 class, and it was considered to be generally very successful. However, a good part of its success, we believe, was due to the fact that the Algebra 2 teacher carefully scheduled and monitored the use of the tutor, and it was a regular feature of the class. Attempting to schedule across schools, times, days, with changing calendars proved daunting, and it was much less successful in other contexts. Due to a number of internal changes at the *Colegio de Bachilleres* described above, online tutoring was not available for the 2011-12 school year.

We concluded that the online tutoring is a feature with considerable potential, and our Algebra 2 experiment showed that it could be used effectively to supplement Spanish instruction where a faculty member may not be always available, or may not be strong in Spanish. Such an innovation should definitely be considered as an option in specific cases, and modifications could be envisioned that would make this a viable option in other contexts. It may be one way to at least partially address the critical shortage of bilingual teachers.

Student Attrition and Academic Performance

We anticipated substantial student attrition in the design of the project and evaluation, and for this reason we focused on this issue in professional development sessions, included a strong parent component, a dedicated counselor, and close monitoring of students. The economic downturn and reverse migration that accompanied it could not have been predicted. However, even beyond this, attrition plagued us in other ways. Some were related to students failing classes and therefore not being eligible to continue taking the SOL courses. This was often associated with counselors placing students in SOL classes inappropriately. Our original agreements with the schools specified very clear requirements for eligibility to participate in the program, among the most important of these was that students be at or near grade level. However, counselors not infrequently placed students in SOL classes who were actually well below grade level and who brought with them a host of academic challenges the project was not designed to address. Once assigned to the class, because of constraints of school schedules, it was impossible to have them re-assigned.

We also encountered a problem in two schools with students who were doing fine in SOL classes but were failing English Language Development (ELD). Their failure in these English development classes put them behind in credits and demoralized them, with domino effects on other classes. We asked how it was possible for perfectly bright students with good attendance and no real behavior problems to fail ELD? After investigating the situation we found that “troubled” teachers are

sometimes put into ELD 1 and 2 because these are courses “no one wants to teach.” Evidently students were receiving failing grades for not turning in some homework assignments and were not given any opportunity to turn in late work. The ELD teachers apparently thought they were upholding standards and teaching students good discipline. However, it came at the expense of setting students up to drop out of school! And, unfortunately these teachers did not seem to have any idea of the kinds of challenges these students face, many working until very late hours or “sofa surfing” from one house to another because they had no permanent residence. Principals explained that they are over a barrel with these teachers because there is no place else to put them!

The cumulative breakdown of the cohort model and the evaluation of the project – students not passing classes and therefore not moving on, insufficient numbers of students to provide whole classes, schools finding it impossible to schedule students who were eligible for the classes because of master schedule problems— resulted in a hybrid evaluation model and a “services as needed” delivery model. This was a big blow to the evaluation because it made most comparisons impossible. With respect to the delivery model, the impact is not as clear. In the end, we served more students than we initially planned, and we provided more course taking-opportunities than we had thought possible.

Non-SOL Teachers in the Schools

We had not fully anticipated the degree to which non-SOL teachers would affect student outcomes. Because we were not offering an entire high school curriculum or training all of the teachers that the SOL students would be assigned to, it had not occurred to us that we might need to intervene at some level with these non-SOL teachers. We had an inkling of this when some principals openly admitted there were teachers they did not think were “good for these kids” and when we determined that some of the SOL students were passing difficult classes like chemistry but failing much less demanding classes like ESL. SOL teachers helped us to understand this seemingly inexplicable situation. Over and over the SOL teachers expressed their frustration that some of the other teachers on the campus were either racist, or had no idea about the circumstances of the immigrant students’ home lives. They did not know that some of these students had no real home, were couch surfing, or had to work until midnight and had no time to do homework, for which they were penalized, and ultimately failed. Thus, in spite of great efforts by SOL teachers, some students were held back, lost hope, and ultimately dropped out as the result of failing grades.

Logistical Issues

Although we knew going into the study that working with schools located 2½ and 3 ½ hours apart from each other could present logistical challenges, especially since the evaluation design called for visits to be at least every other week, we did not anticipate just how difficult this would be, traveling the Southern California highways at all hours. Moreover, it was not infrequent that our researchers would make the lengthy trip to just find that there was an unscheduled assembly or shortened day, or a teacher was sick, or that the teacher could not be available to talk that day for some other reason, and the trip was made for naught. Observing classes and talking with teachers was a key part of the evaluation component, and so these incidents were not only personally frustrating, they had negative implications for data collection. This is one of the issues that we brought to our Critical Friend, David Goldstein. David convinced us that we could buy videotaping equipment for each school for about the price of a failed trip, and we could have teachers videotape themselves giving lessons. This would provide even better content for professional development sessions, help teachers to keep to their scheduled use of the curriculum, and reduce the numbers of trips that researchers needed to make. It did not completely solve the problem of getting teachers to mail their tapes in a timely fashion, but it was a significant improvement in the evaluation design.

V. Modifications to the Evaluation Design

Some changes were made in the evaluation design as the study evolved, in part a response to the realities of collecting data in schools that were seriously challenged by loss of personnel and turnover in office and administrative staff, and in part as a result of having a better understanding of what made sense for immigrant students. Below, we list the modifications that we made and the reasoning behind these modifications:

- A. **We initially proposed collecting pre- and post-California Standards Test (CST) data for SOL and non-SOL comparison students.** After reviewing these data we came to see that they were simply not meaningful. The students – recent immigrants with very low English skills—predictably performed terribly on these tests and most were in the category of “far below basic.” Of course, there is no way to know if this reflected actual academic competencies or simply a lack of understanding English. Some students made progress over time to score at “below basic,” but with such unreliable baseline data, it is impossible to know if this very modest growth was due to an increase in academic skill or growth in understanding English, or just unreliable results. Comparison students looked just as bad as SOL students, so there was no way

to discern any treatment effects with these data. We decided against reporting data that we considered meaningless.

- B. **We initially proposed to collect and analyze pre- and post-test data on the MDTP (algebra readiness) test.** The MDTP was used in most algebra classrooms to assess algebra readiness, as we had intended, but because students were often placed in the classes, “ready or not” due to exigencies of the schools, which we noted above, pre- and post-test scores with these students lacked reliability and were of limited usefulness to the teachers. Therefore teachers were not anxious to spend their precious class time doing tests that didn’t yield any important information for them. Some of the teachers were very slow to do the pre-test and resisted doing the post-test so that these data were uneven across classes and schools. We decided, again, that the data analyses did not yield any reliable or important findings.
- C. **We initially proposed to collect and analyze pre and post WRITE rubric scores.** We had worried that there might be some concern that since we were offering select classes in Spanish, the students would not be adequately developing their English skills. In an effort to address this, we trained all of our teachers to incorporate the WRITE Institute’s writing pedagogy into their content lessons. Teachers enjoyed this training very much and the professional development was excellent, but we quickly found that it was simply too much to expect of teachers to adopt new curriculum, integrate it into their existing lesson plans, teach in two languages, AND incorporate a whole new writing curriculum at the same time. What were we thinking? While we assessed the experience as useful for teachers, we abandoned the idea of adding this component to the project mid-way through the first year, and abandoned the assessment component as well.
- D. **We incorporated students’ own assessment of their English growth as another measure of English language acquisition.** Together with classroom observations and discussions with teachers, the student surveys showed a strong interest in speaking English and strong growth in confidence and use of the language. In fact, we experienced some students wanting to move to English too rapidly even when it was clear that they were not understanding explanations in English. We report on students’ assessment of their English growth in the section on Student Outcomes.
- E. **We had initially intended to track attendance for both comparison and SOL students.** However, while we were able to gather data on attendance of the SOL students, the comparison groups’ attendance data were unevenly entered in the records, sometimes impossible to obtain, and unreliable. This is due, in part, to the fact that we were working with immigrant students who entered at different times of the year and would sometimes be absent for significant

periods of time, appeared to have moved or transferred, and later reappeared at the school. We also found that schools collected these data differently, sometimes by periods, sometimes by days. This made it difficult to compare on the same metric. We decided that we could not provide meaningful comparative analyses of these data.

- F. **We initially intended to report comparison data on graduation and drop out rates. We changed this to report on “persistence,” as this was a more accurate way to describe the students’ trajectories.** Because immigrant students with low English skills rarely graduate on time with their class due to the need to take additional English courses, and sometimes humanities or civics classes offered only in English, they often transfer to a continuation school or adult school, or delay their graduation. Moreover, schools were cooperating in holding some of these students beyond their normal graduation time in order to help them qualify for AB540 (resident tuition) status. Thus, we concluded that tracking *persistence* (i.e., NOT dropping out) was a better way to measure program impact.
- G. **Finally, we initially intended to utilize two sets of comparisons – a prior year’s cohort and a comparison school – but we were forced to modify this in some cases.** Two of our schools (Brawley and Franklin) were unable to help us enlist a comparison school (in spite of the fact that they had initially promised to do this). In the case of Brawley, it was the only comprehensive high school in the district and so the principal had to try to enlist a comparable school outside his district, which proved impossible for him; for Franklin repeated promises to enlist another school never materialized. Hence, we assigned two SOL schools to one of two comparison schools we had been able to recruit and that appeared to be reasonably similar. However, we discovered somewhat inadvertently that these two schools were offering bilingual classes in some of the same subjects as Project SOL and so the “treatment/no treatment” design was called into question. Because the schools did not always indicate (or seemingly know) which classes these were, it was impossible for us to know which of the comparison students might have taken a Spanish language or bilingual class.

VI. Student Outcomes

Primary Student Goals: A-G Math and Science Course Enrollment, Access, and Performance

Course Enrollment

Given that our original goal in this study was to serve a maximum of 240 students, the cumulative numbers of students served, 451 (as shown in Table 8), represents an almost doubling of that goal. Of course, most did not take the entire series of courses that Project SOL offered, but the shift to a “services as needed” model allowed the project to provide needed courses for more students. The number of students served varied greatly by school, largely dependent on the available teachers to teach the courses. Sylmar High School, even though it was only with the project for 3 years, provided more courses for more students than any other school because of the greater availability of willing and well-prepared bilingual teachers.

Table 8. Number of Students Served by Project SOL, 2008-2012

Year	School				All Schools	
	Brawley	Chula Vista	Franklin	Sylmar	New Students	Cumulative Enrollment
2008-09	34	26	37	--	97	97
2009-10	33	15	32	36	116	213
2010-11	1	30	12	58	101	314
2011-12	56	30	15	36	137	451
All Years	124	101	96	130	--	451

Table 9 below shows the total number of students who took each course offered across school sites. In all, 934 course enrollments were registered. As described earlier in this report, each school offered different courses over the four years of the project.

Table 9. Total Course Enrollments, 2008-2012

	2008-09	2009-10	2010-11	2011-12	Total
Algebra	90	79	56	80	305
Biology	80	71	67	49	267
Geometry	0	63	58	61	182
Chemistry	0	0	31	20	51
Environmental Science	0	38	14	20	72
Algebra II	0	0	20	20	40
Physics	0	0	0	17	17
Total	170	251	246	267	934

Due to variations in course offerings across the four schools, as well as students' readiness to take specific math and science courses, Project SOL students varied in the extent to which they were exposed to Project classes (i.e., the study "treatment"). To understand differences in students' experiences and outcomes in terms of "dosage of treatment," we classified students into three groups by their level of exposure to SOL classes (see Table 10). Low dosage meant that students took only one SOL course, medium dosage meant that they took two or three courses, and high dosage meant they took four, five, or six classes. To calculate a student's dosage of SOL, we included course repeats. For example, if a student took SOL Algebra I twice (due to failure on the first attempt), and took SOL biology once, his or her dosage would equal three courses.

Table 10. Project SOL Dosage by School

	Low (1 class)	Medium (2-3 classes)	High (4-6 classes)
Brawley	19	69	36
Chula Vista	92	7	1
Franklin	23	49	24
Sylmar	24	62	24
Total	158	187	85

Course Access and Performance

As expected, one of the project's primary positive outcomes was providing Spanish dominant recent immigrant students with rigorous coursework to which they would not ordinarily have access. All four SOL counselors described this benefit. When asked about the greatest impact Project SOL had on students academically, Mr. Felix said, "The academic support they received in Math and Science allows the students to also do well in other content areas. Students have the opportunity to learn in their native language with resources that they can master." Similarly, Ms. Bobadilla stated, "They have had the opportunity to take and pass A-G requirements as they learn English," and Ms. Garcia told us, "Academically, they have been able to succeed in content subjects at a level that is equal or higher than the education that 'regular students' get. Before Project SOL, the lower level ESL students were either unable to be successful in those classes until much later or they were getting extremely watered down versions of the content. Project SOL students have been able to access content area subject classes a lot sooner than it would have been possible in earlier years."

The project students also described this increased course access. Of the 226 students who were asked what would have happened if SOL were not at their schools, 34% reported that without the presence of Project SOL, they wouldn't have been able to take the classes they needed to graduate high school. Additionally, 43% reported that they wouldn't have had access to math and science courses in a language they could understand. As one student put it, "*Con el Proyecto SOL tengo química y matemáticas. Son clases que se necesitan para graduarse y si no las hubiera tenido el Proyecto SOL estuvieran en inglés y tal vez no las estuviera pasando ahorita*" [With Project SOL I have chemistry and mathematics. These are classes that are needed to graduate and if I had not had Project SOL, those classes would have been in English and I probably would not be passing them now]. Before SOL, a common school response was to wait until students gained proficiency in English before placing them in advanced math and science classes: "They kept us separate. We couldn't take some classes until we could do more in English. My first semester, all of the courses I took were electives. I was not advancing."

In addition to course access, SOL classes allowed students to access rigorous content in a language they could understand. In other non-SOL courses, students experienced a double cognitive load as they worked to translate course content and understand the material. Many students described this process as "*doble trabajo*" [double work]: "First you have to think about the language. You are translating and doing the problem. It's double work." In Project SOL courses, on the other hand, students were able to access course material, and pass their math

and science classes: “I think that if it hadn’t been for Mr. Calderon, I wouldn’t have passed [biology]. It helped me because he spoke in two languages, and I passed easily.” Additionally, students felt that, because they could draw on their primary language in the classroom, they could more actively participate and express themselves: “When I started Project SOL, I felt more free to express myself because when I came, there weren’t any [SOL classes]. All my teachers spoke English. You felt like it’s difficult to talk to them, because you’re always thinking they won’t understand you or won’t listen to you. But when I entered SOL, it was more like, ‘Okay, I can express myself well.’”

Pass Rates for SOL Courses

We have noted the problems with comparison students at the non-SOL schools. As we analyzed the same-school prior year cohorts compared to the SOL cohorts, we found an additional problem: pass rates for individual teachers within the same school varied wildly. In one case, one algebra teacher failed almost 80 percent of her students, while the other algebra teacher passed almost all, and there was no evidence that the teachers had been assigned very different students. One way to address our uneasiness with the problems of comparisons was to aggregate all comparison students (both same school and non-SOL comparison school), to increase the numbers and reduce the effects of individual teachers or individual students. Table 11 combines all comparison non-SOL students with all SOL students who took the same classes. We fully acknowledge that this does not solve the problems of comparability but it does provide some perspective on the pass rates for the courses offered by SOL. In all cases the SOL pass rates are either very comparable or substantially better than those of the comparison students.

The course pass rates still leave open the questions of whether the comparison students were indeed comparable to the SOL students, and if they were, why were they getting access to these courses that are so frequently off limits to EL students? It seems that the best we can say from these data is that many SOL students were gaining access in their schools to courses they would not have otherwise had (because these schools had joined the project in order to be able to offer the courses) and that their outcomes compared well to other EL students, who *probably* were more advanced in English than they were, or who also had access to a bilingual class.

Table 11. Summary of SOL and Comparison Student Pass Rates by Course

	Group	Took (n)	C or better	D or better
Algebra	SOL Students	262	49.2% (129)	64.5% (169)
	Comparison Students	281	43.4 (122)	67.6 (190)
Geometry	SOL Students	114	48.2 (55)	81.6 (93)
	Comparison Students	185	46.5 (86)	76.2 (141)
Algebra II	SOL Students	44	77.3 (34)	88.6 (39)
	Comparison Students	98	45.9 (45)	67.3 (66)
Biology	SOL Students	222	48.6 (108)	80.6 (179)
	Comparison Students	197	49.2 (97)	67.0 (132)
Environmental Science	Comparison Students	17	58.8 (10)	88.2 (15)
	SOL Students	45	66.7 (30)	86.7 (39)
Chemistry	SOL Students	46	80.4 (37)	84.8 (39)
	Comparison Students	60	66.7 (40)	85.0 (51)
Physics	SOL Students	14	57.1 (8)	71.4 (10)
	Comparison Students	21	76.2 (16)	85.7 (18)

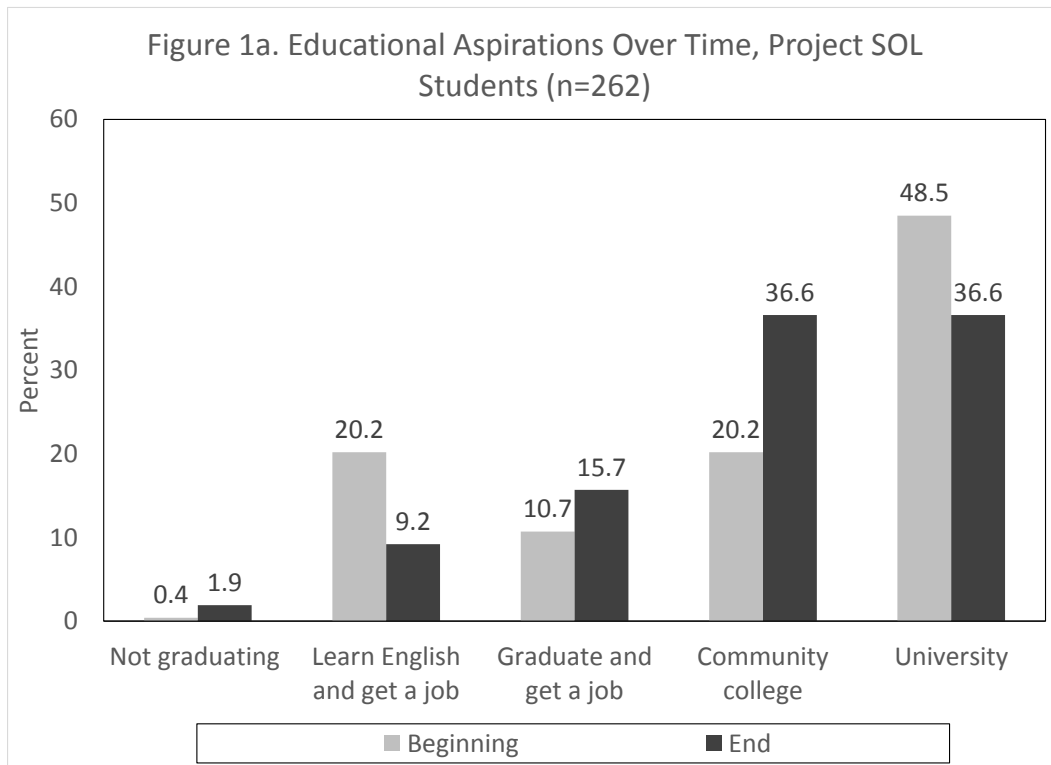
Note: The yellow highlight is for areas where SOL students outperformed non-SOL students.

Additional Goals Associated with Student Objectives: Aspirations, Academic Self-Concept, Computer Environment, Engagement, and Persistence in School

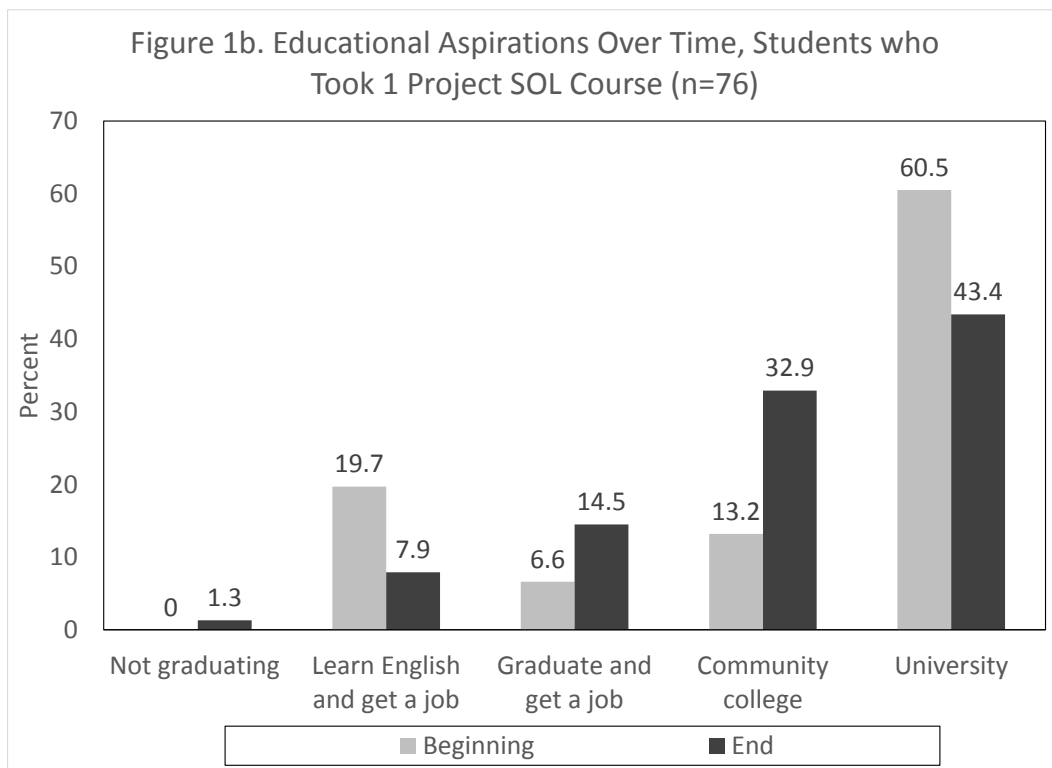
Through providing access to rigorous coursework and supporting students in completing their courses, another goal of the project was to increase students' educational aspirations, facility in a computer environment, and engagement in school.

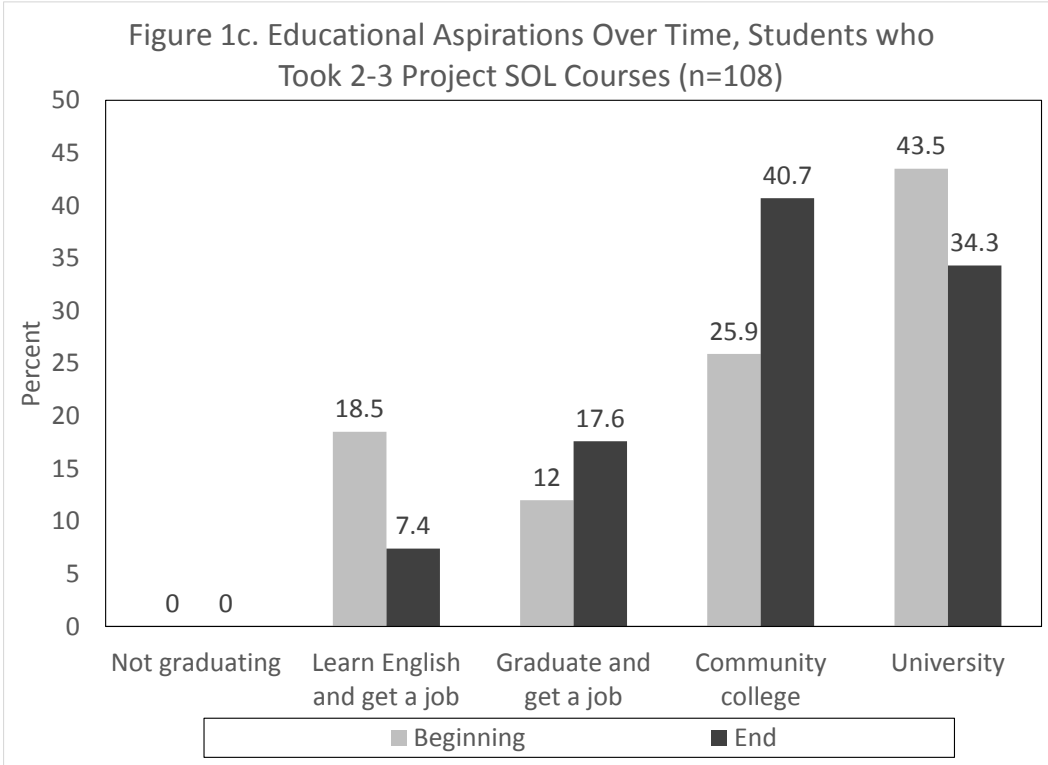
Educational Aspirations

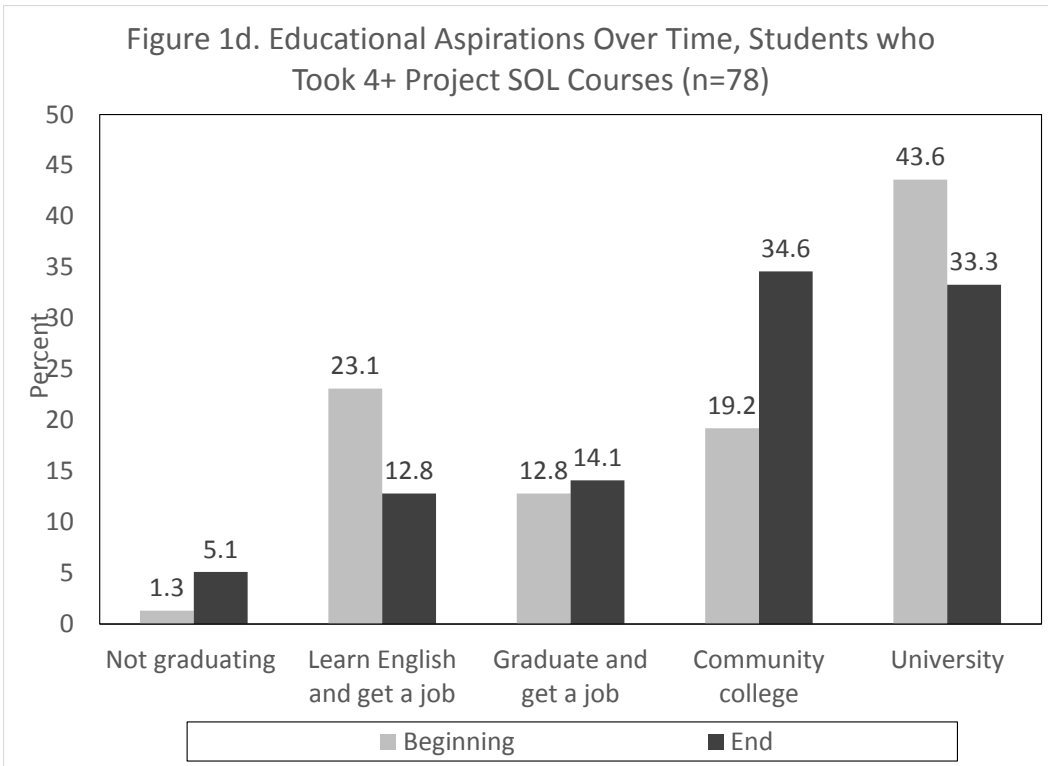
Project SOL students developed higher aspirations for completing high school after they had been in the program. Among the 262 student survey respondents, 20% indicated when they first enrolled in the project that they planned to stay in high school until they learned enough English to get a job (see Figure 1a). By the time these students had exited the program, this decreased to 9%. The number of students who aspired to graduate high school at all increased 10% over the course of the study, from 80 to 90%. Within that group, the number of students who aspired to graduate high school and get a job increased by about 5%, the number of students aspiring to go to community college increased 17% , and the number of students aspiring to attend a four-year university decreased 12%.



To some degree, we attribute the increase in community college aspirations and corresponding decrease in four-year university aspirations to students' enhanced awareness of the educational options available and accessible to them. For example, a larger proportion of students who took only one SOL course reported that they aspired to go to the university than students who took more than one course, both at the beginning and at the end of their time with the project (see Figures 1b-d). We interpret this to mean that these students lacked accurate information about the requirements for acceptance to 4-year colleges. While it is important to help students develop high educational aspirations, we believe it is also important to guide students along pathways that will logically lead them to successful outcomes. Since very few SOL students could qualify for 4-year university admission because of still-developing English skills, the need to complete credit courses in English and sometimes other required subjects, and because of financial constraints, it was critical that students have a realistic plan to complete their requirements and enroll in college. This almost always meant that they would need to begin at community college. But the project also exposed students to 4-year colleges and to the pathway to get there.

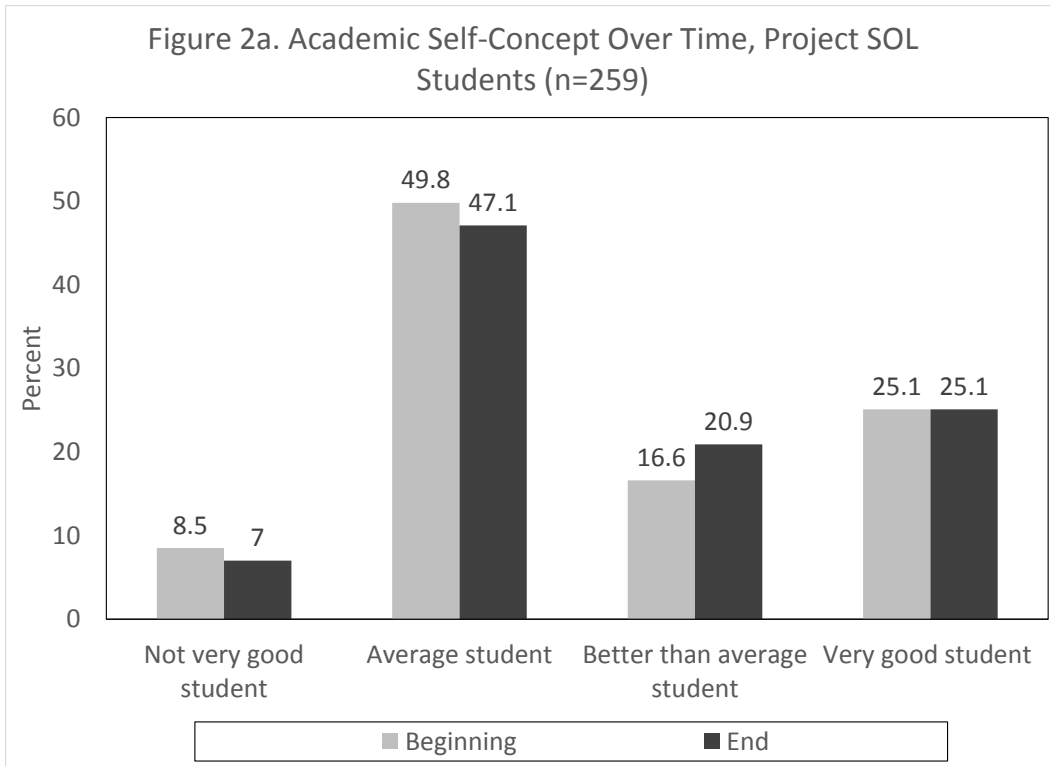




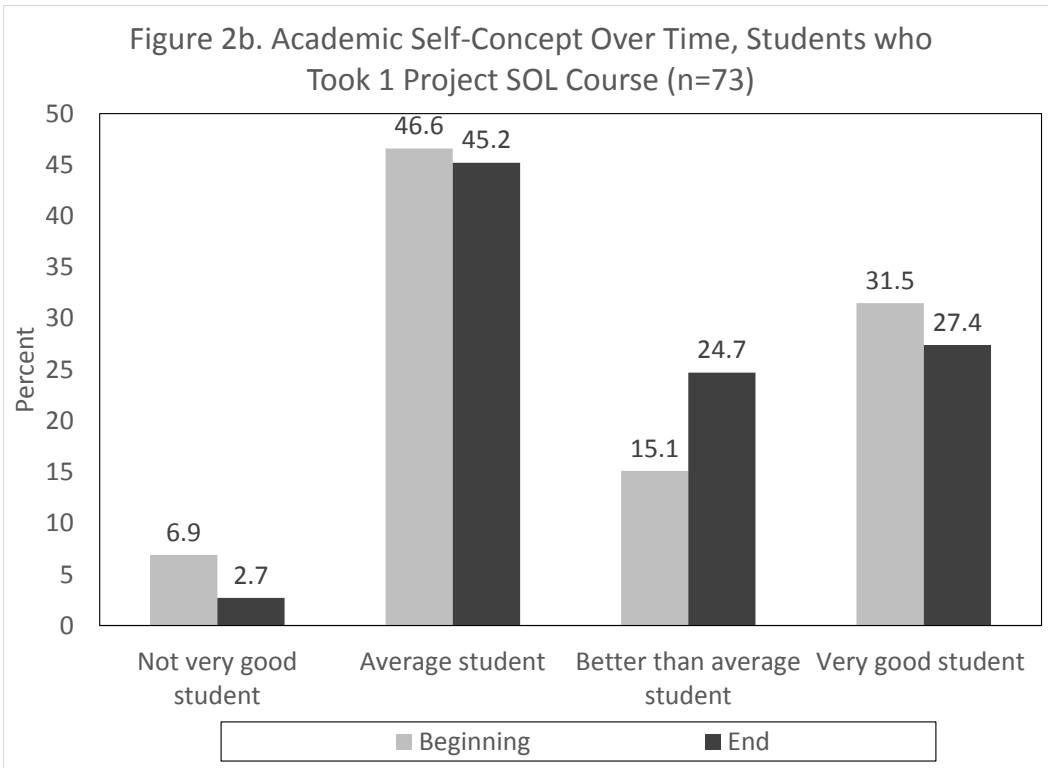


Academic Self-Concept

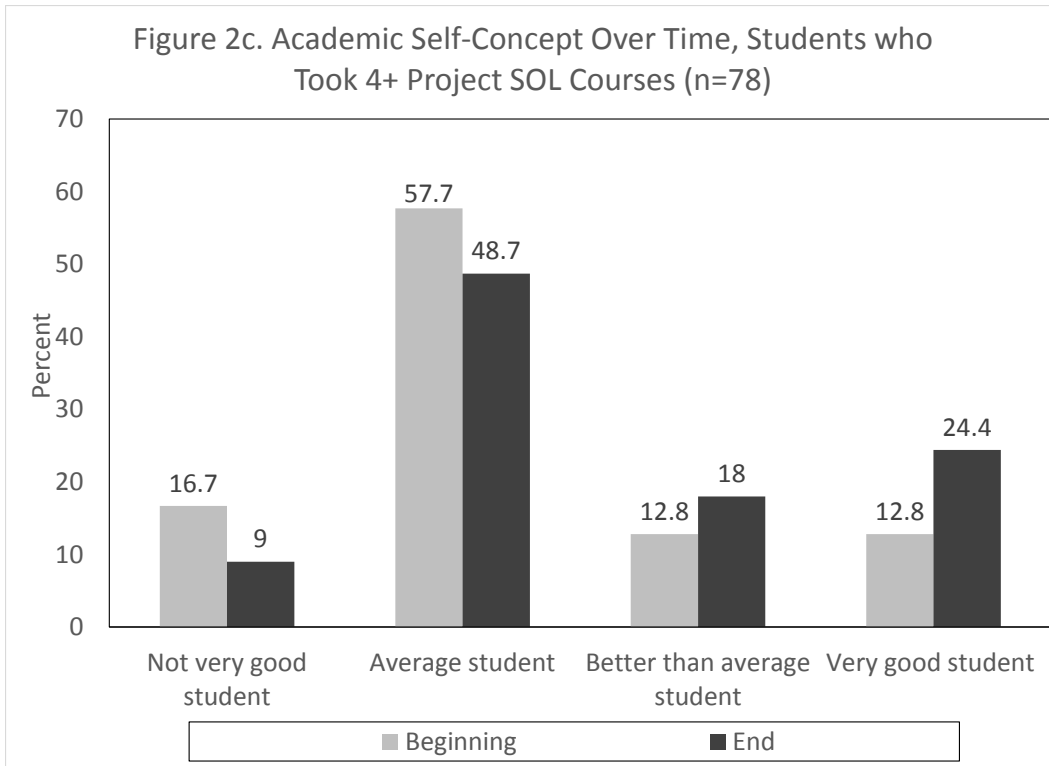
Over time, Project SOL students also began to see themselves as marginally better students. Overall, the number of students who perceived themselves as better than average students increased about 4% over the course of their time in the study, and the number of students who felt that they were very good students stayed the same (see Figure 2a).



Yet, if we consider students by their exposure to SOL courses, we see that more students who took four or more classes saw themselves as very good students; at the beginning of their time in the study, 13% indicated that they felt like very good students, and by the end of the study, 24% described themselves in this way (see Figure 2c). In contrast, students with less exposure to SOL courses reported decreases in their views of themselves as very good students.



SOL students who took only one course also declined in percentages perceiving themselves as “not very good students” and increased substantially in their perceptions of themselves as “better than average” which is a generally positive outcome. These students, however, also reduced their opinion of themselves as “very good students,” which may have been a more accurate reading since there was a correlation between passing courses and taking more SOL courses.



Computer Usage

Students reported overwhelmingly positive attitudes about using computers, with 76% reporting they loved computers, and 22% reporting that they liked computers on the student survey. About 68% of students indicated that they spent between one and three hours on a computer each day, and about 20% indicated spending four or more hours on a computer each day. While a vast majority (over 60%) of students reported using computers for social purposes at the beginning and the end of the study, students increased their reported use of computers for academic purposes. Of the 262 students with longitudinal survey data, 32% reported using computers to learn something related to school when they first began SOL, compared to 46% at the end of their time with the project. This represents an increase of 14%, a difference in proportion that is statistically significant ($p < .05$).

Engagement in School

In addition to supporting students in the classroom, Project SOL worked to create spaces for students outside of the classroom. Club SOL was developed in the second year of the study when team members realized that students needed a place to build relationships with one another and to access important information

related to high school graduation and college. Moreover, research has shown that high school students who are involved in extracurricular activities are more likely to remain in school (Davalos, Chavez, & Guardiola, 1999; Mahoney & Cairns, 1997), develop stronger bonds with their teachers (Fletcher & Brown, 1988), identify with school (Marsh & Kleitman, 2002), and have more positive academic trajectories (Brown & Theobald, 1998; Eccles & Barber, 1999). Additionally, participation in sports and clubs is correlated positively with higher grades, higher aspirations, higher levels of self-esteem, and improved race relations (Brown & Theobald, 1998; Holland & Andre, 1987; O'Brien & Rollefson, 1995). Low-income students appear to benefit from these activities even more than their middle class peers (Marsh & Kleitman, 2002). But there is also evidence that low-income students (Eckart, 1989; McNeal, 1998), as well as Latinos (Ream & Rumberger, 2008) are less likely to participate in such activities. While we know of no studies of immigrant high school students and extracurricular activities, it is reasonable to conclude that they are even less involved in such activities because of the general sense of exclusion that they often feel in U.S. schools (Olsen, 2000). Given the importance of extracurricular activities for positive student outcomes and that many project students were not involved in other activities, the Club offered an important space for such involvement. In fall 2011, we asked students about their extracurricular involvement (see Table 12). While 71% of students reported involvement with Club SOL, only 2% reported involvement in other clubs or groups, 11% in sports, and 6% in student government.

Table 12. Percentage (n) of Project Students Reporting Extracurricular Involvement, Fall 2011 (n=126)

Student Government	Sports	Club SOL	Other Club	None
6% (7)	11% (14)	71% (90)	2% (2)	20% (25)

When asked about the benefits of Club SOL (asked in Fall 2010, Spring 2011, and Spring 2012), 60% of students indicated that the Club at their school was important for providing access to information about the classes they would need to graduate, and 50% reported it was important for information related to college. Additionally, 42% reported they made friends through the Club, and 43% indicated that they enjoyed the college field trips that were a part of the Club experience.

Table 13. Percentage (n) of Students Reporting Specific Benefits of Club SOL (n=224)

I made friends through the Club.	42.4% (95)
I got information on the classes I need to graduate.	59.8% (134)
I got information about the tests I need to take to go to college.	38.8% (87)
I got information about the colleges and universities I can attend.	50.0% (112)
I got help with my homework.	31.7% (71)
I learned about the schooling experiences of other immigrant students.	25.0% (56)
I enjoyed participating in college field trips.	42.9% (96)

Club SOL, and the project overall, were important for students in developing a sense of belonging at school. Reviewing the research on school belonging, Gibson, Gándara, and Koyama (2004) concluded that any kind of extracurricular activity that served to integrate students in school and connect them to other students was likely to support high school persistence and graduation. Furthermore, our analyses of a major national database (Educational Longitudinal Study of 1988 found that the more time spent in extracurricular activities of whatever kind led to increased chances of going to college for Latino students (Gándara, et al., 2013). As Mr. Felix described, “The Project has provided a sense of belonging and pride. The interaction among the students has also contributed to their well-being. Students feel that they belong to something thus enabling them to feel important and be part of the school.” Similarly, Ms. Garcia stated, “I think students have formed a solid group. They know each other well. They have been able to work together as a group to fundraise and they have been able to spend time together outside of school as part of Project SOL.”

In terms of advice and information related to graduating high school and going to college, Project SOL students indicated that other SOL students and their SOL teachers were important. In Fall 2011, students reported that they sought advice from other SOL students about once a week and from SOL teachers a few times per month. These averages were higher than for non-SOL students and students at other schools, as well as for non-SOL teachers and family members (see Table 14).

Table 14. Mean (Standard Deviation) of Responses to the Question, “How often do you go to the following people for advice or information about graduating high school and/or going to college?” (Scale of 1 to 6; 1=never, 2=less than once per month, 3=a few times per month, 4=once a week, 5=a few times per week, and 6=daily)

Students (n=106)			Adults (n=102)		
SOL	Non-SOL	Other School	SOL Teachers	Non-SOL Teachers	Family
4.25 (1.89)	3.70 (1.99)	3.97 (1.95)	3.13 (1.94)	2.61 (1.80)	2.84 (1.90)

Students' responses to the question about who they went to for advice were important indicators of the extent to which Project SOL and the SOL Club had created a support system for the SOL students. They sought advice from other SOL students significantly more than from other non-SOL students ($p < .01$), either at school or outside school, and they went to SOL teachers for advice significantly more than other teachers ($p < .001$), even though they had more non-SOL teachers than SOL teachers. They also sought advice from SOL teachers more, but not significantly more, than from family.

Persistence

Student persistence data, while suffering from the same problems as all of our comparison data, are presented first in the aggregate, since by increasing the numbers we are able to reduce—to some small extent—the impact of particular cases of unreliable data.

Table 15. Percentage (n) of Students Who Persisted or Left School, SOL and Comparison Schools, Classes of 2011 and 2012

	Graduated/On Track to Graduate	Left School	Total
SOL Students	38.3% (70)	61.7% (113)	100% (183)
Comparison Students	27.9 (103)	72.1 (266)	100 (369)

Perhaps nothing speaks more clearly to the challenges faced by the schools, and to a program such as Project SOL, as the figures in Table 15. It must be borne in mind that these represent only a portion of the students who participated in SOL—those that were due to graduate in 2011 and 2012. Within the SOL student group overall there are subgroups of students who had only one class and those who had many, those who were very attached to the program and those who had little attachment, those who actually met the criteria to be included and those who did not. Students in the graduating classes of 2013 or 2014, who may have had the opportunity to take more classes (Sylmar was not in the program at the beginning and Chula Vista contributed few students overall) and who entered a more established program are not included here. Thus, these numbers represent the “worst case scenario” in many ways. Nonetheless, school leaving is a very serious problem, even for those students enrolled in a supportive program. SOL students

appeared to persist at a somewhat higher rate than the aggregate of comparison students across comparison schools and cohorts; but the level of student loss is so high, it is impossible to claim any kind of victory, even if the data could be shown to be reliable. We reiterate that some significant portion of the loss was attributable to the downturn in the economy, parents' loss of jobs, repatriation of families to Mexico in the face of virulent anti-immigrant activities, and the severe disruptions in the schools from massive budget cuts. But loss of students is clearly chronic. Because there were, however, different circumstances and differing levels of confidence in the data at each of the project schools, we also present the persistence data by school, with accompanying explanations.

Table 16. Percentage (n) of Brawley High School and Comparison Students Who Persisted or Left School, Classes of 2011 and 2012

	Graduated/On Track to Graduate	Left School	Total
SOL	54.0% (34)	46.0% (29)	100% (63)
Comparison Cohort	60.7 (17)	39.3 (1)	100 (28)
Comparison School	46.2 (24)	53.8 (28)	100 (52)

Perhaps the “cleanest” data were collected at Brawley and its comparison school in the Chula Vista High School District because this is where we had the most consistent counselor. SOL students at Brawley had a somewhat lower rate of persistence than the same school prior cohort, but this difference can be almost wholly attributed to the economic disaster that befell the area and the repatriation of Mexican citizens. This area of the Imperial Valley was deemed the hardest hit economically in the nation, and the school was very aware of large numbers of families leaving the area. The prior cohort had gone through the school just before the economy tanked and anti-immigrant sentiment hit its peak. Of course, there is also a problem that the prior cohort numbers were small. Brawley SOL students did, however, persist at a somewhat higher rate than those similar students at its comparison school, though given the small numbers this is probably not statistically significant.

Table 17. Percentage (n) of Chula Vista High School and Comparison Students Who Persisted or Left School, Classes of 2011 and 2012

	Graduated/On Track to Graduate	Left School	Total
SOL	37.5% (12)	62.5% (20)	100% (32)
Comparison School	46.2 (24)	53.8 (28)	100 (52)

We include Table 17 for Chula Vista although the prior cohort data cannot be used. We discovered well into the study that the counselors had only selected students for comparison who had already persisted to the 12th grade, eliminating all students who had dropped out. By the time we were able to discern this, prior students who had left the school were no longer in their computers (after two years they are purged). The comparison school for Chula Vista is the same as for Brawley and here we see a difference in favor in the comparison school. However, even if SOL students had wildly outperformed their comparisons, we could have taken little credit for this, as the school ultimately only implemented Algebra I and while we included those SOL students in field trips and provided the parent intervention, we believe the program “dosage” was simply too limited to make any claims about student performance.

Table 18. Percentage (n) of Franklin High School and Comparison Students Who Persisted or Left School, Classes of 2011 and 2012

	Graduated/On Track to Graduate	Left School	Total
SOL Students	22.0% (9)	78.0% (32)	100% (41)
Comparison Cohort	24.2 (15)	75.8 (47)	100 (62)
Comparison School	16 (12)	84 (63)	100 (75)

The persistence rates at Franklin High School were and are abysmal. And so were the persistence rates at the comparison school, located in the same district.

Because the school records are so poorly kept, it is not possible to know how many of the school leavers actually ended up going to a continuation or alternative school and graduating, or returning to Franklin (a not uncommon occurrence). We observed the practice of moving most students over 18 to alternative sites, and many immigrant students are older than their peers. However the records did not allow us to know this with any consistency. Most transcripts were simply marked “gone.”

Table 19. Percentage (n) of Sylmar High School and Comparison Students Who Persisted or Left School, Classes of 2011 and 2012

	Graduated/On Track to Graduate	Left School	Total
SOL SHS	31.9% (15)	68.1% (32)	100% (47)
Comparison Cohort	23.0 (35)	77.0 (117)	100 (152)
Comparison School	16 (12)	84 (63)	100 (75)

Sylmar High School was probably the most successful implementation of Project SOL in the sense that at Sylmar the program was built from the ground up. Project SOL offered more courses at this campus and involved more teachers than any other school. None of the teachers had been teaching in Spanish nor did they have a parent program or support group of any sort. And here, the comments of teachers are more compelling than the numbers in Table 19, which do not capture the trajectories of students who came into the program in the classes of 2013 and 2014. So, while the initial numbers do not look good, there is reason to believe that Project SOL was moving students forward. As Mr. Fuentes, who taught Algebra 1, Geometry, and Algebra 2 and thus came to know the students well over time reflected, “. . . the students from Proyecto SOL . . . for the most part, all of them are on track to graduate . . . My 17 students that I had in algebra 2, which are 11th and 12th graders [classes of 2013 and 2014], they’re all on track to graduate, and they all know the importance of graduating . . . this year [2012] we had four or five students graduate, and I think next year there’s going to be a lot more.”

VII. Teacher Outcomes

Changes in Expectations for Spanish-Dominant Students

Table 20 displays changes in teachers' and counselors' expectations for their Spanish-dominant students over the course of the study. Overall, the results are somewhat mixed. In some cases, teachers entered the project with high expectations for their Spanish-dominant students, and these expectations remained relatively constant over time (e.g., Mr. Alvarez, Ms. Donlucas). In other cases, teacher expectations increased over time. For example, Mr. DeJesus expected that 50% of his Spanish-dominant students would go on to community college in 2008, which increased to 70% in 2012. Similarly, Mr. Calderón expected 50% of his Spanish-dominant students to go to community college in 2008, compared to 80% in 2012. As Mr. Alvarez put it: "I think that Project SOL helped me to keep in mind that my objective is to prepare my students to go straight to college." Mr. Fuentes expressed,

"[I]t isn't until now that I realized what was really happening, and what were some of the true outcomes that were possible . . . some of these seniors graduating and applying to colleges, seniors graduating with honors, you know? And these are students that three years ago, they were in my Algebra 1 class and they had just come from Mexico or Central America or South America . . . No one told me what were the possibilities or the outcomes. And now I see what it is, and now I could visualize like, you know, starting another cohort, where I want to take them, and where they're going to end up, you know?"

Ms. Estrada also noted,

"I have seen an increase. I mean, it's not 100%, but then it's not 100% of any of the groups, the sub-groups. But I think these last four years where Project SOL was in existence, I saw more English learners actually taking higher math classes, and applying to college, and going to college, not just applying but actually going. A lot of them are going to junior colleges, community colleges, because of their financial situation or immigrant situation, but they're going!"

In one case, the teacher's expectations decreased over the course of the project. Ms. A. Lopez, the biology teacher at Sylmar, reported decreases in each category for her Spanish-dominant students. However, based on interviews with this

teacher, it was clear that Project SOL was the first teaching experience the teacher had with Spanish-dominant students. Ms. López talked about how she had not realized the many challenges these students face in their daily lives. This knowledge caused her to re-evaluate the options available to these students based on what she viewed as a more realistic understanding of their circumstances.

Table 20. Changes over Time (at Project Entry and Exit) in Teacher Expectations for Spanish Dominant Students (n=10)

<i>What percent of your Spanish dominant students do you think will...</i>								
	Graduate High School		Leave Prepared for College		Go to Community College		Go to 4-Year University	
	Entry	Exit	Entry	Exit	Entry	Exit	Entry	Exit
Brawley								
Alvarez (2008-12)	90	80	80	80	80	80	70	50
Olivar (2008-12)	80	80	70	90	70	80	70	60
Chula Vista								
De Jesus (2008-12)	60	80	60	70	50	70	35	5
Franklin								
Estrada (2008-12)	20	40	20	20	10	15	5	5
Calderon (2008-12)	100	70	50	40	50	80	50	50
Donlucas (2010-11)	50	70	60	50	60	50	10	10
Sylmar								
Fuentes (2009-12)	60	70	50	55	40	25	10	25
A. Lopez (2009-12)	50	10	50	5	30	4	10	1
V. Lopez (2010-12)	40	50	20	15	10	5	5	2
Campbell (2011-12)	80	--	20	--	20	--	5	--

Use and Comfort Teaching in Spanish

Over the course of the project, most SOL teachers reported more frequent use of Spanish for instructional purposes, which would be expected. When asked how their use of Spanish in the classroom changed since the beginning of Project SOL, 60% of teachers (n=6) reported they used Spanish much more, 10% (n=1) a little more, and 20% (n=2) reported no change. Those that reported no change were

already using Spanish in their classrooms (mostly under the radar screen), but had previously not had a Spanish curriculum or online materials to follow. Importantly, most teachers not only reported using Spanish more in their instruction, but most also reported strengthening their skills in Spanish. By the end of the demonstration period, all teachers rated themselves at least average in their ability to teach in Spanish and 7 of 9 teachers rated themselves as “above average” or “excellent.” Teachers talked about how the project had challenged their Spanish-speaking ability and had caused them to strengthen their language and pedagogical skills. Project SOL had a clear effect of helping these teachers develop as excellent bilingual instructors—a critically needed capacity in a state like California.

Table 21. Teachers’ Ratings of Spanish Instructional Abilities at Program Entry and Exit (*Responses to the question: How would you rate your ability to use Spanish and/or content in Spanish for instruction?*)

	Entry	Exit
Brawley		
Alvarez	Above average	Excellent
Olivar	Above average	Excellent
Chula Vista		
de Jesus	Average	Above average
Franklin		
Estrada	Above average	Above average
Calderon	Above average	Excellent
Don Lucas	Above average	Above average
Sylmar		
Fuentes	Average	Above average
A. Lopez	Average	Average
V. Lopez	Need to improve	Average

Computer Use

All SOL teachers reported an increased use of computers over the course of the project. When asked how their use of computers for teaching purposes changed from the beginning to the end of the project, six teachers (60%) reported using computers much more, three teachers (30%) reported slightly more use of computers, and one teacher (10%) reported no change in her computer use. With respect to teachers' perceived abilities using technology for instructional purposes, six teachers reported improvements over the course of the study. Four teachers rated themselves as average in their ability to use technology in their teaching at the beginning of the project; by the end of the project, they rated themselves as above average users of technology. Similarly, Ms. Estrada rated herself as a little below average at the beginning of the project, but increased to an average user by the end of the project. Mr. Calderón rated himself above average at the start of the project, yet felt that he was an excellent user of technology for instruction by the end of the project. Increasing teachers' skill and comfort in the use of technology in the classroom is a major goal for California schools. As Mr. Calderón noted, "Technology-wise, the support was there. I had support from the technology department and then support from you guys."

Overall Benefits of Project SOL for Teachers

All teachers reported that Project SOL had a positive effect on their skills as teachers generally. Specifically, 70% of teachers (n=7) reported the project had a significant effect on their skills, and 30% (n=3) reported a moderate effect. With respect to how Project SOL helped to strengthen their skills, teachers reported several components, including increased knowledge of academic Spanish, awareness of different teaching strategies for English language learners, and comfort with trying new techniques in the classroom. With respect to academic Spanish, Mr. Fuentes reported, "The project has developed my vocabulary with mathematical terms, there were many terms I was not familiar with in Spanish and now I am." Ms. Arleni Lopez stated, "My science vocabulary in Spanish has improved. Overall, my academic Spanish has improved which makes me sound much more professional when speaking to parents." Mr. Calderón, who did his undergraduate work in Spanish, thought it funny that other teachers were so excited about learning new vocabulary. For him, the use of Spanish was about "making things easier for the kids." He was excited by the idea that he could actually be the critical link of understanding for the students. Ms. V. Lopez, the chemistry teacher, who had needed to brush up her Spanish and learn new terms, jumped at the chance to respond to the question, "would you want to teach in Spanish again?" "I'd definitely want to do it again. I think it just makes you really grateful." In interviews, most teachers also talked about the way that using

Spanish in the classroom caused them to focus more on academic language. Either because they were re-learning academic language or because they were now free to openly focus on language issues, academic language became a central piece of their teaching.

In terms of instruction for ELs, Mr. de Jesus said, “Project SOL has given me the opportunity to differentiate my lessons,” and Ms. Veronica Lopez reported, “Project SOL has strengthened my skills because I had to use different methods of teaching to help Spanish-dominant students.” Most of the teachers also reported using technology more and feeling more comfortable with it. Ms. Estrada also shared,

“I thought I was pretty humane about my students, and then I realized I wasn’t. I wasn’t in touch with their reality until I started teaching them and getting to know them better, and realizing that they don’t go home sometimes to a parent or two parents. They live with other people, their life is very different from what we’re used to. Their responsibilities are different, so most of them have to work to help the householdNot everybody else lives the same way you do.”

Ms. A. Lopez also reported that Project SOL made her more aware of the needs of her ELs: “It has helped me become more culturally aware of my students and their lives, how they see school, the everyday problems they face, their interest as immigrant students.” Finally, teachers reported a willingness to try new teaching techniques through their involvement with SOL. Ms. Estrada shared,

“I feel more comfortable trying new techniques, and supplementing my instruction with different things, and activities. I’m not all by the book anymore! I do more group stuff. . . . like partner things, strategies, learning strategies . . . pair share, mix pair share, you know things that . . . I do that more now, I find it works better.”

In addition to the new energy that teachers felt in their teaching and their relationship to their students, their teaching was affected by being recognized for their extraordinary efforts. We endeavored to spotlight their contributions. The SOL teachers were honored with a “teacher of the year” award from the California Association for Bilingual Education (CABE) in Sacramento in 2012. The California Legislature in the State Capitol also presented them with beautiful framed commendations that related the personal history of each teacher. One of our teachers, Mr. Alvarez, was selected as a “Latino Teacher of the Year” and honored at the White House in August of 2012. Virtually all of the teachers were moved to

tears at the recognition they received. Mr. Calderon noted that the reason he remained in teaching after having received a pink slip for two consecutive years (the notification that he could be laid off) was because of his participation in Project SOL.

Professional Support

Overall, teachers were quite satisfied with the professional support they received from the Project SOL team. Eight teachers reported that they were very satisfied, and two teachers reported that they were somewhat satisfied. Teachers indicated that consistent and timely communication with SOL staff members was helpful, and that they felt valued as project teachers. Ms. Olivar explained, “I always receive a fast and accurate response whenever I ask something, and I feel valued as a Project SOL teacher.” Mr. Fuentes reported, “I was in constant contact with SOL staff members; they were always helpful and supported us with technology and strategies, and even pacing.” Some teachers commented that they would have liked to have professional development sessions as a group more often (although it was nightmarish trying to convene all together twice a year because of different schedules), and they mentioned how much they were able to learn from each other about different teaching techniques, especially in the Spanish-language classroom. For example, Mr. Calderon lamented,

“I wish we could have had more professional development . . . because it’s good to discuss, see data, you know every time I had a meeting with all the colleagues, it was pretty good. I felt good. I came away with new ideas, I came away with more *ganas*, which means more willingness to work, because I wasn’t the only one, you know, having those results or making the same mistakes, so that helped me a lot.”

VIII. Counselor Outcomes

The same kind of increases in expectations for students that were noted for teachers were also evident for counselors. Mr. Felix, the counselor at Brawley, and Ms. Bobadilla, the counselor at Sylmar both increased their expectations for their Spanish-dominant students, while one counselor, Ms. Garcia saw a decline in expectations. As was the case with the teacher, Ms. López, this was explained by the fact that Ms. Garcia had never counseled Spanish-dominant students before and she, like Ms. López, professed to be surprised by the daily challenges these students faced once she became more familiar with their out-of-school lives.

Counseling Spanish Dominant Students

All project counselors reported an increase in their effectiveness with respect to working with Spanish-dominant students. Two counselors reported that they felt much more effective, and two counselors reported feeling a little more effective. Mr. Felix felt that the project allowed him to develop strong relationships with project students:

“The project has allowed me the opportunity to be more personable with SOL participants due to the relationship we have established during the years. By doing so, it has also allowed the SOL participants to be more receptive to me and my advice. I've noticed that I'm more visible on campus. I try to be visible before and after school, during breaks and lunch. I greet all of my students with a handshake and a smile. I'm more open and understanding with all of my students.”

Ms. Garcia shared similar sentiments, and described enhanced relationships with parents as well:

“It's gotten a lot more personal as I've gotten to know the students better and better. Many of their parents have my personal cell number and will call me on my cell to talk to me about their children. Likewise, many of my students have my number and will text me if they are absent to ask for homework or for me to talk to their teachers on their behalf.”

Table 22. Changes over Time (at Project Entry and Exit) in Counselor Expectations for Spanish Dominant Students (n=4)

<i>“What percent of your Spanish dominant students do you think will....”</i>								
	Graduate High School		Leave Prepared for College		Go to Community College		Go to 4-Year University	
	Entry	Exit	Entry	Exit	Entry	Exit	Entry	Exit
Brawley								
Felix (2008-12)	80	95	70	92	50	90	2	0
Chula Vista								
Padilla (2010-12)	96	97	88	30	99	30	3	20
Franklin								
Garcia (2009-12)	90	50	50	30	50	30	30	10
Sylmar								
Bobadilla (2009-11)	70	80	25	90	18	30	8	10

IX. What did we learn from Project SOL?

If we had found that everything worked exactly as we had hoped and that all students got the maximum benefit from our intervention, this would have been heartening, but less interesting, and perhaps not even as worthwhile as the lessons that we have taken away from this demonstration project. It is clear from the discussion of challenges the project faced and the modifications that we needed to make to the evaluation design that everything did not work as we hoped and that all students did not get maximum benefit from the intervention. We do believe, however, that we changed the lives of some students, opened the eyes of others, and had a modest but positive impact on many, and had a dramatic impact on the teachers with whom we worked. We also believe that the schools we worked in found new and better ways to meet the needs of immigrant students and that as long as the same personnel are in place the lessons learned will be carried forward. In terms of lessons learned that we think are especially important to share with the field are the following:

- (1) While we had hoped to address a single critical need of immigrant students in the high schools—access to an appropriate and rigorous curriculum that would help them stay in high school, graduate, and prepare for postsecondary education— we found that a single intervention – a slice into the school and the lives of the

students—is insufficient to fundamentally change the trajectories of most of these students. We would argue that all of the students who participated in Project SOL received benefit, and for some the benefit was very significant. But changing students’ academic and life trajectories requires a more comprehensive approach. We quickly realized that we would need peer support, and we added the SOL Club and some important activities with it, and we knew that parents needed information about how to advocate for their children and to monitor their progress, and we added a parent component through PIQE (Parent Institute for Quality Education). We also came to realize that the students needed to see college campuses to know what college is, and they would need college counseling to learn how to apply, especially those who were undocumented. From the beginning we insisted on an assigned counselor to advocate for the students and provide them with some of this information.

Immigrant and English learner students, like other vulnerable students, must cope with a myriad of problems both at school and in their homes and communities, and Project SOL did not have the resources to address all or even most of these. Perhaps the real epiphany came when we looked at grades in the first year of the project and saw that students who were passing our rigorous college preparatory classes were failing English Language Development – a class in which the cognitive demands are relatively low. So it clearly wasn’t that they weren’t capable of doing the work. And then we began to see that some of our students did not have any parents living with them, or a steady place to live. Some worked long hours and came to school tired and hungry. Immigrant students also felt isolated much of the time and often unwelcome by other students. They could not communicate with most of their teachers, and they knew that those teachers often thought of them as bad students or not smart, a waste of the teacher’s time. Some teachers actually resented them and harassed them. Some principals told us there were teachers that they could not place these students with for fear of how they would be treated by the teacher.

Any intervention that hopes to truly make a difference in the lives – and not just in particular classrooms—of these students needs to reach into the whole school, and involve all the students’ teachers, who need to meet regularly with the counselor to understand the students’ circumstances. Classes should be integrated, so that math and English and science and history are linked in meaningful ways for the students, so they can borrow learning from one class and apply it to another, reinforcing what has been learned and helping to build contexts to fit the new knowledge into. They need bilingual teachers who can communicate with them and their families, and these teachers need to be able to take the time to communicate with their students, and with their parents. They also need regular contact with mainstream peers and they need to feel accepted

and to feel that they belong. They need friends who speak English. It would also help if there were a social service office that could provide emergency assistance for basic expenses like food, or a place to sleep, and be able to help families find such resources in their community.

These students also need extra time – after school, weekends, summers, however possible, to catch up with other students and to be able to take the critical English classes they need but cannot get, especially while their English is still weak and they are assigned to ESL or ELD. They need credit recovery courses, preferably online and *in vivo*, so that they can make up courses that they have not been able to take. They need opportunities to connect with the wider world, to see the possibilities that exist outside their communities, and to meet people who hold jobs that offer promise and satisfaction and intellectual stimulation. We are reminded of a field trip that we planned for students from Brawley to travel the three hours to the University of California at San Diego to experience for a day a real college campus, to see the dorm rooms, and to get a taste of what college life might be like. The students were thrilled and somewhat awestruck, as most had never been this far from home in the U.S. But, the principal asked one more thing of us: “Take my kids to the ocean. Most have never seen the ocean.” He knew how constricted their lives were and how little they knew of the world outside of their rural community. And it’s hard to imagine a different life, one that depends on doing well in school and going on to college, if you have never seen it or known anyone who has experienced it.

The Project SOL students need all of these things, *in addition to* the courses we could offer, the club we helped to establish, the parent program, and the counseling.

(2) At a point about two years into the project, we began to see that the greatest impact of Project SOL may have been on the teachers. Students were receiving something that was useful to them while in high school, but teachers were clearly developing in ways that were going to stay with them for a lifetime, or at least for the time that they continued to teach. Teachers were re-energized in their teaching, they were excited about learning new ways to teach, they were using technology more and looking for things on the web to supplement their classes, and they were beginning to see that they had a true calling in working with immigrant students. Much of this was related to the sense of empowerment that teaching in Spanish gave them. Those teachers whose Spanish was less than perfect began studying to bring up their skills, those for whom Spanish was their first language felt not just a freedom to use the language, but a mandate, and they saw how their students responded. Both teachers and students felt empowered by the ability to communicate in a common language that promoted better

understanding, and that also forged deeper ties between students and teachers, and between teachers and parents. In a state in which the use of students' primary language in the classroom has been all but forbidden, being given license to teach their students in a language they could understand was a revelation. Students understood, teachers felt gratified, and the bonds between the two grew.

Most teachers talked about helping their students feel a sense of belonging, which they considered to be critical to their learning. Mr. Calderon was eloquent in his description of how he spoke to his students about belonging:

“I tell my students, ‘What is the first thing you do when you go camping? . . . build a tent, right?’ Well, why do you build a tent? How come you don’t just start cooking? Sometimes you’re hungry, right? But first we have to have the place where we are going to stay. So that’s the main idea of Project SOL. It gives students a place, the sense of belonging. So, if they know they have a place to go in school . . . somewhere they can feel comfortable . . . and they have someone that is going to be there for them. . . .It’s a sense of security, so we build security in the students, so they can start exploring other areas. For example, participating in leadership, forming part of a school team, like their soccer team or basketball team, being service students we build security, and that’s one of the things that made me love Project SOL, because we were going beyond the academic situation.”

Teacher after teacher also talked about being a role model for the students. Mr. Alvarez mused about how he was just like the students he teaches, trying to find his way without being able to speak the language. “That is why I give everything I have to them. I was one of them.” And as Mr. Calderon confided, “I think we come from the same background [as the kids] . . . I really have to be careful of what I do and what I say, even the way I joke . . . because now I know that I have some influence on these kids, and hopefully it’s, you know, everything that they’ve learned from me is positive.” The knowledge that they could build a special relationship with the students confirmed for them the importance of what they were doing in the SOL classroom.

(3) We thought at the beginning that we might be able to use monolingual English-speaking teachers, with support from Mexican online teachers, to deliver the curriculum to students. This was one objective of the experiment – to test out this model so that we might be able to extend these courses beyond the few schools that were fortunate to have bilingual teachers. But we quickly found that we had

no takers among monolingual English-speaking teachers, and that if we had, it probably would not have gone well. We found that even among our bilingual teachers, those who spoke Spanish the most fluently were the ones who most adhered to the design of the program initially. What this taught us is that there is no substitute for bilingual teachers.

Later we found that the schools serving these students know this. Comparison schools that we had been told were not providing Spanish- language classes in math and science (and other subjects) were, in fact, doing so, but this was not well documented. “Bilingual” is the word that no one dares utter, and many principals labor under the misimpression that they are not supposed to provide bilingual classes (because of the restrictions imposed by Proposition 227, which in actuality only really pertain to elementary schools). It turns out that some high schools with students whose English is very weak are offering these courses where they can, but they don’t advertise it and they often do not show up as such on master schedules. Unfortunately, few high school teachers have had training in bilingual education because the state of California has largely ignored this need. But the schools struggle to find competent individuals to provide the instruction. It would be so much better for the schools and the teachers, and the teacher force in general, if we owned up to the need for these teachers and provided the proper training, and incentives, for them to pursue a career as a certified bilingual teacher.

(4) We were told many times by our principals that one of the primary benefits of Project SOL was calling attention to the special needs, and strengths, of these students. Even at very caring schools where we collaborated, principals mentioned that they simply had not thought about how schooling and instruction needed to be organized differently for these students, and that they had special needs that were not being recognized. Project SOL brought into focus the particular needs of immigrant English learners and mobilized schools to treat them differently. School personnel came to see that they could not simply be part of the master schedule, but needed to be scheduled in a way that allowed them to take advantage of particular resources and to connect with teachers who understood their circumstances. Our teachers routinely mentioned that other teachers in the school did not understand the kids, and blamed them for things that were simply beyond their control, or did not realize the students’ potential. It was clear that the SOL teachers wanted to work with these students and wished for a schedule that would allow them keep the students in their classes over time. As several teachers pointed out, those students who were able to take two or more consecutive courses with a SOL teacher were thriving. The SOL teachers were able to motivate and support them, and, knowing the students, were able to gear their instruction to them.

The SOL students needed counseling that spoke to their particular circumstances, but that also recognized the potential in the students. They needed opportunities to be integrated with non-immigrant students and they needed to be encouraged to participate in extracurricular activities at school and to develop a sense of belonging at the school. As Mr. Fuentes shared, they need to be “inside that circle of comfort” to feel secure and to be motivated. Sometimes, they also needed to be linked to social services, but someone had to be paying attention to all of these things, and before Project SOL it was no one’s responsibility. All the schools noted that they were much more aware of these students’ needs as a result of Project SOL, and as a result had mobilized resources for them.

(5) In spite of the shortcomings of a project that only intervened in one slice of the students’ lives, we were reaffirmed in our belief that a binational—or multinational—curriculum that students and teachers can easily access is not just a good idea, it is a growing necessity in a world in which migration will continue to play an important role in the lives of nations. Our globalizing world cries out for educational solutions for students who move back and forth across borders, and for those who would like to be able to access a rigorous bilingual curriculum in their home countries so that they might more easily live and work across linguistic, cultural, and physical borders. We knew going in to the project that others had tried such curricular innovations online, but without the benefit of a trained teacher in the classroom to guide the students. These other experiments have predictably failed. By the standards of these other efforts, our project was an enormous success. And we are moving on to refine the curricular offerings, align them with common core standards, get them into open access, offer them bilingually (not just in Spanish), and to build a manual to train teachers in best practices for using such curricula.

We had also worried along the way about the appropriate time to move students into English curriculum and we discussed this openly with the teachers. We found that this was a decision best made by teachers and students together. As Ms. V. Lopez noted, sometimes her students asked for English, but weren’t really ready to understand concepts in English without Spanish support. So, she noted, “They were replying in Spanish and I’d tell them the words in English, so things like that worked really well.” This led us to the conclusion that the curriculum needs to be completely bilingual, so that teachers and students together can decide how and when to use which language. Ms. Lopez had sage advice to those who would complain about the Spanish instruction:

“Yes, there’s concerns for people saying ‘Oh, they’re not speaking English. It’s all in Spanish.’ But what do you want? Do you want an

uneducated student that knows minimal English or do you want somebody that's educated?These students weren't [before the program] educated overall. I mean, education, whatever language, is going to make a better person!"

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APPENDIX A
Comments on the Project SOL Final Report
by David Goldstein³

Introduction

As was noted in *Preparing Secondary English Learners for Graduation and College, the Project SOL Final Report* by Principal Investigator, Patricia Gándara, with Ursula Aldana, Marco Diaz, Megan Hopkins, Danny Martinez and Mary Martinez-Wenzl of the UCLA Civil Rights Project/Proyecto Derechos Civiles, I served as a “critical friend” for the evaluation team of the SOL pilot. In that role, I observed most aspects of the first three years of the pilot implementation from the perspective of a colleague with knowledge and experience working with the program’s target population, but not directly affiliated with the program staff at the UCLA Civil Rights Project/El Proyecto de Derechos Civiles or with Project SOL. My independence and autonomy permitted me a level of objectivity because, as an observer rather than a staff member or even a contract- evaluator, I could reflect on the project’s strengths and challenges, contextualize issues that impacted its interventions, inquire about decisions, and make recommendations that the SOL team could consider as they tried to document the impacts and address obstacles.

The primary purpose of the observations and recommendations in my previous reports to the evaluation team was to suggest how the team might improve efforts to document findings and collect information about program implementation and the impacts of program interventions. The intent of this brief report is to complement the *Project SOL Final Report* (Gándara, et al., 2013, hereafter) by adding observations to the complete summary of the pilot’s objectives, challenges, successes and findings. Rather than present observations of a researcher working in the trenches, my comments are the observations and recommendations from 40,000 feet above. I take the long view and try to identify possible next steps that build on the findings and experiences of the pilot to address the increasingly critical goal that the SOL project was conceived to address: “The overall program objective was to increase the capacity of school personnel to meet the academic needs of Spanish-dominant students in preparing them for high school graduation and postsecondary education.” (Gándara, et al., 2013, p. 14

³ David Goldstein was “critical friend” and outside observer during the Pilot Phase of Project SOL

Context

Per the *Final Report*, over the four years of the Project SOL pilot, many of the findings have remained relatively consistent from year-to-year based on all of the usable data that were collected and analyzed.⁴ For example, from the beginning the SOL team worked closely with the schools and the teachers to address obstacles and overcome setbacks. Throughout the SOL pilot period “While the evaluations *by teachers* of use and utility of the *Colegio* online curriculum are mixed and by no means overwhelming endorsements of the curriculum ‘as is,’ it is important to bear in mind that the curriculum was a vehicle for creating a program of services—academic, personal, social, and familial—that were aimed at supporting the students through successful completion of high school and creating a pathway to college” (Gándara, et al., 2013, p. 30). Across the pilot phase, the observers and analysis of data indicated that providing just one element—the *Colegio* online curriculum (referred to as *Colegio* hereafter)—was unlikely to produce the desired outcomes or meet the needs of the target population. The SOL model is just that, a model with multiple elements that this pilot has shown has great potential to address a growing problem with few other solutions if deployed as part of a framework to address a variety of risk factors present in the lives of the target population.

From my perspective as an observer, it is apparent that the *Colegio* online curriculum centerpiece of this pilot was a necessary, but insufficient tool to address the educational and public policy problem of what we as a society risk if we fail to provide a minimum threshold of service that permits this group of capable high school immigrant students to advance beyond high school. As summarized on p. 7 of the Gándara, *et al.* report, the unique value proposition of the *Colegio* online materials was that they were a California standards and A-G requirements-aligned, college preparatory, Mexican online curriculum that provided access to EL students. Absent *Colegio*, this large student population had no realistic access to advanced curricula in math or science because they did not have sufficient command of English to take and pass rigorous courses designed for fluent English speakers. Further, the SOL Project targeted those secondary English Learners (ELs) who had sufficient prior schooling to be “within striking distance” of

⁴ From the first pilot semester, the evaluator faced consistent barriers to data collection efforts. Obtaining comparison group data, within schools for previous years or from similar students at neighboring schools met with delays, resistance, and institutional barriers. Counselors who tried to provide agreed-upon datasets were forced to do so manually and rarely met deadlines. State records offer little help as the CA Data Quest online system lacks nimble analysis tools making clean statewide data for this target population (hs, EL students) difficult to obtain.

taking and passing Algebra 1 and/or Biology as it is offered in the California high school curriculum. (By “striking distance” we meant to provide some flexibility for counselors to select students who they thought could do the work, perhaps with some special support, independent of their school records, which may or may not have accurately reflected their abilities and drive). It is worth noting that the schools themselves, and the state, in general, do not seem to identify or recognize that there are EL high school students with the capacity to take and pass advanced courses. This failure to provide, or acknowledge if they are providing, any services to these students while they acquire English proficiency may be a legacy of the 1998 Proposition 227 that required English-only for CA students, but the SOL evaluation underscores the fact that with adequate support, students from this target population can make academic progress, graduate, and pursue postsecondary credentials that we know result in greater productivity.

The Fundamental Features of the SOL Pilot

Over the course of the pilot, the lead team faced numerous challenges, learned many lessons, and made adjustments to aspects of the model as they observed the patterns of implementation, use, and impacts on students. The strongest indicator of success that emerged as affecting SOL’s impact on students at the pilot schools was the presence of a teacher who could speak to the students (and parents) in their primary language (Spanish), knew the discipline and specific course subject, was trained to teach EL students (to some degree, though this varied) and expressed a personal interest in helping these students succeed. Such a teacher was found to be the crucial variable in an otherwise somewhat chaotic puzzle of the school lives of students in the target population. The way that an effective bilingual teacher with deep content knowledge and an interest in helping EL students use the online resource to scaffold (in this case) math and science content has a profound impact on how much the students take away from the experience of using the curriculum. In addition to the importance of teaching and instruction that an expert teacher brings, the capacity to read and speak about what is addressed in the online materials seems to close the loop, both on the level of communicating the content and in addressing the social-emotional needs of these vulnerable students. This finding aligns with the research of Carol Dweck who has written about the power a student’s mindset has over whether that student believes improved performance is possible or whether s/he settles for poor performance and folds under pressure due to the belief that effort doesn’t really matter.⁵

⁵ Dweck, Carol S. (2008). *Mindset: The new psychology of success*. New York: Ballantine Books.

A second consistent finding from the SOL pilot is that the online curriculum must offer teachers and students the flexibility due to the consistent pattern of unanticipated and unknown obstacles that inevitably pop up in their schools. A constant in the lives of the student population that SOL serves is that most of these students live in a world that is somewhat precarious. If the access to online curriculum or delivery was inflexible or did not allow them to get help when they needed it, they were unlikely to be able to persist (during the pilot phase).

The students themselves are third critical piece of this effort. This target population faces much uncertainty, pressure to focus on other aspects of their lives besides school, and competing obligations and responsibilities. Spanish language online content support helps to alleviate the “double work” that is required when they attempt to enroll in demanding content (like algebra and biology) while still not able to completely understand the content-based academic language. The pilot was designed to serve a specific segment of the high school EL population that is identified as being within “striking distance” of taking and passing Algebra and Biology and similar courses (Gándara, et al., 2013, p. 7). The SOL pilot demonstrated that access to lessons in Spanish was helpful, but unlikely to be enough if offered without other SOL elements. Maximum impact occurs in cases where effective, Spanish-proficient instructors who also know the course content well and are able and willing to navigate the software and invest in understanding how it compares to their own course syllabus support the students. The pilot evaluation team used surveys and data on student persistence to conclude that when students felt a part of a supportive classroom and/or SOL club community, had at least fairly reliable access to the online curriculum, and got a glimpse of how success in high school and postsecondary educational opportunities can put them on a pathway to a better job or life, they were more likely to continue to make progress towards graduation. In some sense the finding on ‘belongingness’ confirms the obvious: if there is some hope that effort leads to results, students are more likely to engage.

Key Features of an Effective *Colegio* (or similar) Online Spanish Program

1. As noted consistently since Yr. 1 of the pilot, teachers who combine strong content knowledge with fluency in Spanish, mastery of course and discipline content, applicable academic language in English and Spanish and content, and convey deep personal interest in supporting immigrant EL students;
2. Support for teachers implementing SOL classes as evidenced by professional development, facilitated sharing with colleagues (from their own and other participating schools), and outside coaches who can provide guidance when issues/questions arise;
3. Students who meet the criteria for participation, understand the scope of what they will do and gain from SOL participation and want to commit to SOL;
4. A site-based extra-curricular support structure (Club SOL) and the presence of supportive adults who form a learning community, share best practices among instructors, and help participating students, encourage peer support, create a space where participants can go with questions about their educational trajectory and explore postsecondary opportunities (such as college field trips and guidance about admission requirements, tests they must take, and deadlines);
5. Reliable access to e-curricula;
6. Unambiguous support for implementation by the school site principal (or administrator with appropriate authority) *and* at least one lead school counselor that should agree to following a briefing that includes a concise summary of expectations that explicitly identifies necessary site-controlled program inputs (and that spells out how implementation with their students in the target population will benefit their bottom line school performance), since the pilot unequivocally demonstrated that inadequate collaboration from either principals (administrators) or counselors will prevent the program from realizing its goals;
7. A semester-long calendar indicating that the *Colegio* course has daily or weekly minimum hours, access to required elements and advanced notice of disruptions;
8. Reliable *Colegio* tutors who know the material well and can converse in Spanish (desirable if and only if well-coordinated and logistically feasible):
 - a. In the years since the SOL pilot began, a wave of so-called massive open online courses (MOOCs) offered by top universities around the world provide unprecedented access to courses, but also offer online tutorials, meet up opportunities and peer-to-peer interaction among students scattered far and wide. This might offer a model for students taking *Colegio*-type courses too

- b. Peer to peer tutoring
 - c. Improved chat or live interaction with qualified tutors;
9. Given the evaluator’s experience trying to collect clean, accurate data, it is apparent that struggling schools attended by the target population and an ineffective state data system will not provide reliable, timely, actionable data so an outline for ongoing evaluation or participant outcomes may provide a better way to monitor implementation and outcomes. Given the obstacles to reliable collection of evaluation indicators during the pilot, future evaluation benchmarks should be refined to focus on passage of the *Colegio*-supported courses at rates approximating the school and district in which situated, positive results on relevant state tests (e.g., Common Core or Next Generation Science if adopted by states), persistence in *Colegio* classes and school and, in the longer term, high school graduation and enrollment in postsecondary programs such as community college, certificate programs, or university (Gándara, et al., 2013, p. 47).

Barriers to Realizing the Goals of *Colegio* (or similar) Online Spanish Curricula

1. Access to computers is critically important to this model; therefore, participating schools must meet a minimum threshold of access to computers, stable broadband connections, capacity for IT support and repair when systems go down or are compromised, and given that few schools that serve the target audience have this capacity, it would be reasonable to seek/secure Wi-Fi-enabled tablets for students to use and a reliable service contract;
2. If alternative computing options are not feasible, there should be a memo of understanding beyond an informal acknowledgement that SOL classes need to be able to consistently schedule computer time during instructional time or at some time that all participants can attend in order to implement the computer-based component of this system—this must be a reliable variable for SOL to be viable;
3. Negative behavior by non-SOL teachers toward SOL students (as described in Gándara, et al., 2013, p. 47), passive resistance of non-SOL (ELD teachers at two pilot schools) teachers who made unreasonable demands and/or were unwilling to work with the leadership, counseling and teaching team can ruin the program;
4. The selection process for determining which students participate should adhere to clearly articulated criteria provided. Students who are not prepared, willing to strive and informed about the objectives, or uninterested, should not participate. A standard intake form should be provided so that any deviation from the criteria is clear and a rationale for overriding it is available;

5. A reliable and consistent means of communication should be set up and put into the memorandum of understanding with the school's principal and a counselor to keep them in the loop regarding progress, issues and obstacles throughout the life of the program

What's Next?

As Project SOL evolved, the evaluation team identified multiple impacts during the pilot years. Almost 1,000 courses were delivered to students who otherwise would not have had access to them. Through SOL, teachers and others delivered information about access and postsecondary opportunities to students who probably assumed they were ineligible, or who were unlikely to ever take advanced courses, absent the academic opportunities they accessed through SOL. SOL team coaches provided intensive and immediately applicable professional development and instructional delivery support to bilingual teachers. This support for teachers enhanced their capacity to serve and strengthened their perceptions about their power to address the needs of this underserved population of immigrant, EL, Spanish-speaking students. The combination of support and materials, to some degree, changed schools' perceptions of the capacity and potential of the target population and of their own ability to address the needs of these students. The evaluation team also identified aspects of the lives of students in the target population that deserve consideration, but are not directly within the scope of schools, though they have direct and serious implications for efforts to educate them and help them become productive members of society commensurate with their potential.

A review of the kinds of challenges participating students faced during the pilot phase of SOL revealed a number of issues that come with the territory in serving this target population. Foremost among these lessons is that implementation of a *Colegio*-like online program based on the SOL pilot years is best suited to a systems approach that integrates several major components. Overall "success" is more likely if implementation is considered as part of a public policy or educational initiative that addresses the situation hundreds of thousands of high school EL students find themselves in today. They can either be ignored (the status quo), thus depriving the overall economy of incredible potential contributors, or their situation can be addressed through a next-generation Project SOL that offers a relatively cost-effective intervention similar in many ways to educational approaches that are already being funded by the private sector (for home schoolers and state virtual schools initiatives, public private partnerships, private sector investors and charter management organizations, to name a few). As noted in the SOL report, if our schools devoted a fraction of the funds currently directed to students classified as special education towards addressing the needs

of EL students, a *SOL*-like system would be a realistic possibility for all those eligible as defined by *SOL* criteria (Gándara, et al., 2013, p. 4).

What If: Potential Elements of the *Next Generation (SOL 2.0)* Framework

As mentioned previously in this document, over just the last four years, we have witnessed many developments in the digital educational arena that could be applied to the lessons learned from the *SOL* pilot to produce an updated package of *SOL*-inspired services that addresses the target population more effectively than was possible in the *SOL* pilot years. Potentially “game-changing” upgrades to the *Colegio* online instructional units used online in the Project *SOL* model include:

1. “Marketing” of a future version of *Colegio* could package program elements so that a threshold of service (professional development, teacher support, Club and parent elements coordination, online curricula and user-friendly/reliable access to tutors/asesores, even IT and hardware) could be provided to clusters of schools in a region or smaller districts that combine funds to provide services to a “cohort” of their target population or on demand to individual students, based on their needs;
2. Redesign of the online materials such that they are *dynamic* rather than those that were piloted, which were, basically, static online versions of textbooks;
3. The contemporary version of *Colegio* curriculum could update the courses by aligning them with Common Core State Standards in math (currently adopted by 46 states and due to be implemented by 2014-15 when new assessments also aligned to the Common Core will be in use), aligning them to current A-G college entrance requirements, (possibly) aligning them to the Next Generation Science Standards that were recently unveiled and that 26 states are considering adopting in the years ahead;
4. Updated online materials could include customer-friendly chat options or reliable, on-demand or scheduled telephone access to tutors familiar with curriculum that are now ubiquitous in the online sphere and present in many versions of educational software currently in use;
5. An improved version of the *asesor* component of *Colegio* curriculum (described by Gándara, et al. on pp. 36-39) that was only partially successfully used in one school (FHS by Algebra 2 teacher Donlucas) during the pilot years, either as a live chat or a call-in seems to have great potential if scheduling and reliable access obstacles can be overcome (which seems likely given the state of interactive technology and if a *state-of-the-art* version of *Colegio* online resource is developed);
6. Materials could provide at least some recent phenomena such as “flipped classroom” lessons and/or on-demand support modeled on the highly

- popular Kahn Academy online tutorials that were not available/in common use during the SOL pilot years (<https://www.khanacademy.org/>);
7. Colegio instruction could follow the blended learning models that have been field tested in postsecondary MOOCs with increasing frequency and to positive acclaim in 2012-13 (and was used in pilot by SHS teacher Fuentes (Gándara, et al., 2013. p. 30);
 8. Explore the option of a variation on *Colegio* programming that adapts some version of the tried but unsuccessful distance learning model since many states now require that students take at least one course delivered online to graduate (Alabama, Idaho, Florida, Michigan, Virginia, W. Virginia) while the number of districts requiring online courses is growing at rates even faster than states;
 9. Given the Pilot findings (Gándara, et al., 2013. p. 31) by Guerrero regarding teachers' enthusiasm for, use of, and capacity to truly integrate curriculum improved with Spanish language competency, regarding the optimal teacher qualifications that include both Spanish language fluency (or close), subject competence and facility with the "academic language" specific to the math or science course to be taught, it is worth developing either an interview protocol that permits program leaders to understand where prospective teachers fall on a spectrum of readiness to teach this kind of program or a (timed) survey that can be taken online (perhaps better in that it could check for some necessary capacity to use digital tools) that would allow program leaders to determine whether instructor is, in fact, able to communicate in a content-specific, Spanish simulated environment. This could also be used to inform future professional development if teachers are identified as being within "striking distance" of successfully leading a *Colegio*-like course;
 10. Challenges that arose from dealing with school-related realities might be better addressed at the outset of future collaborations since the pilot resulted in numerous examples of obstacles, both anticipated and unanticipated, that could be either pre-engineered to avoid (use of a set of wireless tablets with a service contract) or after or before school scheduling modifications;
 11. Technology-related obstacles might be addressed in future SOL projects through explicit agreements identifying the hardware and broadband requirements, possibly through grant-financed solutions or in-kind contributions from service or hardware providers that should be explored;
 12. There is an increasingly viable option through the wireless tablet. One education company, Wireless Generation/Amplify, introduced a tablet for about \$300 and a two year service contract of \$99, though that is not likely the model for a *Colegio* program, it shows that an option to avoid school

- computing difficulties may not be out of the question (more initial investment, but fewer complications and greater flexibility);
13. Include analytics in future versions of online curricula that permit analysis of student use, measurement of time online, engagement, formative and ongoing review of understanding to track instructional utility;
 14. Challenges with Mexican partners who developed *Colegio* might be addressed through partnership with another group in Mexico for *Colegio* 2.0, or through protocols governing how the issues that caused friction during the SOL pilot will be addressed under a new contract;
 15. If a software developer is willing to make appropriate investments in developing SOL online materials in recognition of the potential value to SOL students across a number of states, their development costs could be recouped as the model goes to scale in new “markets”;
 16. Partnership with group like National Board for Professional Teaching Standards (<http://www.nbpts.org/>) who have an interest in expanding the number of teachers they certify as meeting their standards and may be interested in developing a “Spanish bilingual high school math and science teacher” certification or the Phi Delta Kappan’s Future Educators of America (<http://futureeducators.org/>) who are using the updated Perkins Career Technical Education funding stream to support state Future Educator programs that serve high school students interested in exploring teaching careers through programming that might align well with development of school club leadership and professional development aligned to a *Colegio*-type program:
 - a. Improve school engagement, persistence and course taking options and facilitate reclassification by increasing ELD options available in a broader menu of course options for students who demonstrate capacity to use materials in math and science and who might benefit from the opportunity to take other classes online
 - b. Consider including a software element that permits data collection on student outcomes that many districts are now using in lieu of relying on generally ineffective state, district or school systems (see offerings from organizations like *escholar* (<http://escholar.com/>)).