Defining the Specific Project

Starting with some of the data related to our students we can see a specific need particularly among the underprepared and first generation majority of our students.

Data Set 1

<table>
<thead>
<tr>
<th>BC Student Success Scorecard – Momentum Point Comparison Data</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Math</strong></td>
</tr>
<tr>
<td>BC’s Rate</td>
</tr>
<tr>
<td>21.4%</td>
</tr>
<tr>
<td>Underprepared</td>
</tr>
<tr>
<td>30 Units</td>
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<tr>
<td>Degree/Transfer</td>
</tr>
</tbody>
</table>

**Remediation:** Percentage of credit students who started below transfer level in English, mathematics, and/or ESL and completed a college-level course in the same discipline.

**30 Units:** Percentage of degree, certificate and/or transfer-seeking students who achieved at least 30 units within six years.

**Transfer/Completion:** Percentage of degree, certificate and/or transfer-seeking students who completed a degree, certificate or transfer-related outcomes within six years.

Data Set 2

Students enter BC underprepared:

Over 84% of BC students enter college in need of at least one basic skills course; over 98% of these students need developmental math.

- **Basic skills students fail math, English, and ESL at unacceptable rates:**
  
  Between 2010 and 2013, failure rates in basic skills math ranged from 28 to 67%; in English from 18 to 43%, and in ESL from 19 to 43%.

- **Hispanics are particularly at risk of failing:**

Between 2010 and 2013 the failure rates among Hispanic students in their first math class at BC was approximately 56%.

- **The majority of students who do enter the basic skills math sequence do not persist:**

Over a three-year period (20010-13), only 48% of the students in prealgebra enrolled in the next level, beginning algebra; 33% of students in beginning algebra enrolled in the next level, intermediate algebra.
• **Very few students placed in remedial math and English make it to transfer-level courses:**

Less than 3% of the students who begin 3 or 4 levels below transfer level math, where the majority of our students currently place, and less than 11% starting at these levels in English will ever make it to a transfer-level math class.

• **The longer students spend in remediation, the less likely they are to finish the sequence and continue into college-level work.**

In Math, of those placed in the highest level basic skills course, 33% will finish; at mid-level, only 12% will finish. Only 4% of those placed in the lowest level of basic skills math will finish the sequence.

*Sources: CCCCO Datamart, BC Institutional Research and Planning, CCCCO Student Success Scorecard, ATD Research Study*

Bakersfield College is not satisfied with these statistics and we are doing something about it. A group of about 40 Bakersfield College faculty, staff and administrators will be working with 450 students that are new entering freshman through the California Student Opportunity and Access Program (CalSOAP). CalSOAP was established by the state legislature in 1978 and is instrumental in identifying and aiding students who need information about postsecondary education and financial aid. The goal is to increase achievement levels of low-income, students or geographic regions with documented low-eligibility or college participation rates, and who are first in their families to attend college. Cal-SOAP is an intersegmental outreach program that spans high schools, BC and CSUB in our region.

**Goals and plans**

**Research:** Examine historical data for our students, major pathways (work on these for interventions and messaging to students) to discover where students go off the path, are swirling, or lose momentum.

**Intervention:** Identify and implement effective interventions through mentorship and classroom designed interventions which include Habits of the Mind tools to improve success. Track interventions by following individual students and course success. Use the data to create messaging to students so that they understand the importance of their own work and engagement with the interventions.

**Outcomes:**
1. Fewer students are placed into long remedial pathways.
2. Decrease time to collegiate level math and writing
3. Improve clarity of educational pathways
4. Eventually increase the certificate, degree, and transfer outcomes.

**Component 1: Data Mining (see file of inputs, outputs and outcomes)**
Data analysis will be conducted by a researcher (Dr. Peter Riley Bahr University of Michigan) examining the historical student data such as:

- Demographic measures (sex, race/ethnicity, age, citizenship status, etc.)
- Enrollment status at college entry (e.g. First-time, transfer, degree holder, etc.)
- Placement test scores
- Course enrollment
- Course outcome records
- Information including any detailed information about the courses including outcomes and content
- Remedial pathways in math, English, and reading
- Enrollment in noncredit coursework (at Bakersfield this includes our tutoring and some Supplemental Education work)
- Measures of students' goals, plans, objectives, program of study, Student Education Plans
- Degree and certificate pathways
- High school data
- Records of certificates, degrees, or other credentials awarded to students
- Records of participation in special programs, such as CalSOAP, EOPS, MESA, etc., etc., etc.
- Records of financial aid application, award, and receipt
- Records of interaction with advising/counseling/career services through SARS
- Records of interventions specified for the cohort and recorded through electronic or paper records (such as the course generated action plans or SARS alert)
- Other relevant records that are available

**Component 2: Pattern analysis**
The data above will be examined to determine patterns contributing to success as well as patterns that appear to contribute to students checking out or failure. The goal is to use “machine learning” in order to inform student services and to create early warning messaging within the institution that involves any area that could provide support, guidance, interventions or other necessary educational supports to help sustain and guide the student’s efforts. Interventions related to these key points will be identified and tracked in order to create a college guidance system accessible perhaps through an APPLE or DROID app. The guidance system will message students via email and text in order to provide real-time relevant guidance on a regular basis.

The information gleaned from these data will be used for interventions with students, examples of these interventions include basic things such as:
If a student says on the application that they are a veteran – they will be messaged about the veterans’ center and given information for services.
If a student indicates that they have children, they will be sent a message about the child care center on campus.
If the student has applied for a BOG (Board of Governors) waiver, the student will be messaged concerning FAFSA due dates and other relevant and timely information.

At a deeper level students will be messaged regarding specifically identified individual needs through the SARS Early Alert System. Examples of this include: when a student fails the first quiz or exam, the faculty member will send an early alert which will indicate to all relevant parties an action, such as tutoring or supplemental education or if a student indicates health, financial or family issues, messaging to the appropriate support and resource centers will be sent to contact the student directly. The student will receive messaging about setting up an appointment and after the appointment is set up the student will receive texts prior to the meeting to remind them of the meeting time and location.

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**BC Predictive Analytics**

- Data mining to improve student success
  - Determine break points where students are lost
  - Determine appropriate interventions
- Predictive modeling to improve placement
  - Optimal course taking patterns
  - Move toward more analytic model based on LBCC work
- Create student messaging system that will help deliver intervention in a timely manner using predictive analytics
The goal is continuous and relevant messaging informed through data mining and organized through machine learning. In addition BC will use this information to further fine-tune and inform our pathways and interventions such as:

a. Analyzing and using high school data to guide students
b. Tracking and improving our Multiple Measures Placement
c. Analyzing the efficacy of our placement test, including practice and diagnostics to improve more accurate placement
d. Track and measure student completion of remediation courses and the pathway to college level courses
e. Track and Measure BC student completion of college outcomes

This work will be informed through continuum data which is currently housed in a central [CalPASS² website. Cal-PASS Plus’ mission is to provide actionable data to help improve student success along the education-to-workforce pipeline. Collaboration using this data will inform better instruction, help close achievement gaps, identify scalable best practices, and improve transitions. Cal-PASS Plus offers longitudinal data charts, detailed analysis of pre-K through 16 transitions and workplace outcomes, information and artifacts on success factors, and comparisons among like universities, colleges, K-12 school systems and schools.

Bakersfield College is a pilot college and has faculty on participating in the MMAP Multiple Measures project and CAI Common Assessment Projects as described below. The project leads for each of these projects are also members of the Predictive Analytics Project BC is working on.

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1 CalPASS: Cal-PASS Plus, created through leadership and funding by California Community College Chancellor’s Office, is an accessible, actionable and collaborative pre-K through 16 system of student data.
https://www.calpassplus.org
“The Multiple Measures Assessment Project

The Multiple Measures Assessment Project is a collaborative effort led by Cal-PASS Plus and the RP Group, with support from the CCCCO to build a data warehouse, analytic tools and a communications strategy to support California Community Colleges (CCC) in implementing multiple measures of assessment for course placement.

The Multiple Measures Assessment Project includes the development of a secure, large and robust data warehouse that collects, stores and analyzes multiple measures, including high school transcript and test data. This data warehouse also includes MIS and placement test data for each community college.

Existing research will be leveraged to identify, analyze and validate known multiple measures data points. Also, predictive analytic software will be utilized to identify new data points that can serve as effective multiple measures.

Currently, ten pilot colleges are assisting in development of the analytic tools and user interface that will accompany the data warehouse. They will test the tools and models using local college data supplied through the data warehouse. Their efforts will inform other key initiatives and programs, including the development of a Common Assessment System for the California Community College System.

For more information please visit: http://rpgroup.org/projects/multiple-measures-assessment-project

Common Assessment Initiative

Butte-Glenn Community College District (Butte), in partnership with San Joaquin Delta College (SJDC), Saddleback Community College (Saddleback), the California Partnership for Achieving Student Success (Cal-PASS Plus), and the Academic Senate, will collaborate to develop a comprehensive, common assessment system that utilizes multiple measures of placement and contains informational, test preparation, test delivery, test administration, data collection, and placement guidance and research. The Common Assessment System (CAS) will be developed to reduce remediation rates and provide statewide efficiencies for the placement process.

The CAI will widely engage faculty and community college leaders in the development of assessments, the testing platform, the student and faculty interface and related products and tools as part of the initiative. Pilot colleges will also be engaged throughout the development of the CAI to gain local user input and direction, as well as provide key data for validating the effectiveness of the assessment instruments.

The CAI will be developed in four phases: Development, Pilot, Implementation, and Maintenance. The pilot will begin for placement for Fall 2015 and full implementation will occur
the following year.
For more information please visit: http://cccassess.org/

Component 3: Specific application and testing of the system using a student cohort
In Fall 2014, BC will work with a cohort of 400+ CalSOAP\textsuperscript{2} students (see Appendix A for more information about these students) where many/most students were placed into precollegiate math and/or English. Placement of all the CalSOAP students was determined by multiple measures (a rough form of predictive analytics) rather than by the historical method which relied heavily on the placement test alone. These students have completed the 4 steps of the matriculation process defined in the SSSP—orientation, assessment/placement, educational plan, follow-up services prior to placement.

The students will be designated and identified as a cohort called Making it Happen (MIH). They will be messaged about registration through phone calls made after analysis of their registration details. The students will be invited to campus in June and asked to participate in the cohort. Participation involves signing a contract (see Appendix B) that commits them to participate in a set of strategies and interventions from placement to follow up services with the goal that the students will successfully complete their college level math and college level English by Spring 2015. Successful completion is defined as exhibiting the necessary learning outcomes in the coursework represented by a passing grade in the course, as well as institutional outcomes (think, communicate, demonstrate and engage see ILO’s in Appendix C) by the end of three terms (Summer 2014, Fall 2014, Spring 2015). The student cohort progress will be tracked using the standard metrics in the institutional scorecard, as metrics specifically indicated in the evaluation section of this proposal.

Selection of data to track into the future concerning interventions must follow the principles below:
1. Necessary data elements (and the mechanisms through which those data elements will be collected) need to be determined FAR in advance of the initiation of the intervention (months in advance, not days or weeks), and the determination of what constitutes a "necessary" data element should be driven by the goals of the intervention, the likely outcomes of the intervention, and potential confounding factors in determining whether the intervention works. These elements are determined far in advance of implementing the intervention.

2. Necessary data elements need to be collected consistently and in as objective a manner as possible. In other words, as much person-to-person variation in the assignment of specific values, scores, ratings, and/or categorizations should be removed as possible, and the means by which specific values, scores, ratings, and/or categorizations are assigned should be systematized such that they are assigned in precisely the same way and in precisely the same

\textsuperscript{2} CalSOAP: The California Student Opportunity and Access Program (Cal-SOAP) was established by the state legislature in 1978. BC CalSOAP students are part of a special grant project through CSUB where students of low SES are coached by counselors in training through the college application process.
3. When the assignment of specific values, scores, ratings, and categorizations requires a person to make a judgment (e.g., Instructor A judges this student to be "highly motivated" to learn the content of course X, as opposed to "moderately motivated" or "unmotivated"), it always is desirable to have that judgment cross-checked and confirmed independently by a second person who is not allowed to know the first person's judgment. You can think of this as a "blind review" insofar as the second person's judgment is not influenced by the first person's judgment.

4. Necessary data elements should be collected without fail in every case. The bane of every analysis is missing data. Even one missing data element can remove a case (a student) from the analysis. If ten data elements are collected for every student, and if an average of 10% of data elements across the sample are "missing" valid values, then, in theory, you face the possibility of losing every single student from the analysis simply because, on average, every student has a missing value. (NOTE: Missing values actually tend to "clump", with some students having missing values on lots of data elements and some having none, but, still, it remains that missing values are a problem.) There are work-arounds for missing data, but the best and most desirable situation is no missing data.

5. The vehicles through which data elements are collected (e.g., survey questions, observations) need to be carefully designed to remove ambiguity and measurement error. For example, a simple question like "What is your household income?" will mean something very different to a 40-year-old student than it will to an 18-year-old student because "household" is ambiguous and depends on one's stage of life. Furthermore, it is likely to be reported more accurately by the 40-year-old than by the 18-year-old simply due to the amount of information a 40-year-old has about his/her own household income. Similarly, it's been demonstrated empirically that data collected through the Chancellor's Office original measure of student's goal (e.g., transfer with credential, transfer without credential, associate's degree, certificate) is distorted by the fact that students tend to select the first box simply because it's the first. Problems like this need to be identified and resolved well in advance of the initiation of the intervention, and that takes a lot of time and a lot of hard thinking, which brings us back to point

Component 4: Mentor Cohort
Bakersfield College faculty, staff, and administration of Bakersfield College are committed to the development, implementation, and evaluation of a new initiative called “Making It Happen” to be piloted in Fall 2014 with 450 students. These students from the 26 feeder high school students are from a population known in the KHSD as Cal SOAP students. A cohort of 450 Cal SOAP students who will be attending Bakersfield College in Fall 2014 has been identified and a new initiative is being created and rolled out called “Making It Happen.” The cohort of 450 Cal SOAP students attending BC will be identified as MIH students. Historically, these students

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3 ibid
have assessed and been placed into courses in English and Mathematics that are two, three or four levels below transfer. Historically, a small percentage (3% in Math, 11% in English) have begun at such low levels and successfully completed transfer level curriculum. Because such 80% percentage of the students Bakersfield College serves are first generation students and 84% placing below transfer level it is imperative that Bakersfield College create new pathways and new approaches for providing opportunities for success for the students it serves.

**Component 5: Classroom Intervention: A Focus on Vital Signs rather than an autopsy**

The Bakersfield College faculty, staff, and administration have come together for many intensive meetings to examine the past and current progress of students at Bakersfield College, to ask difficult questions about equity and the work done at the college, and to begin to envision a new future for entering students beginning in the Fall 2014 Semester.

The following steps have already been taken
1. Data and Equity Conferences.

2. Identification of late enrollment of students in local area high schools and implementation of a process to take placement and assessment to the HS campuses where students may test better. Four HS were selected and piloted

3. Identification of English and Math as courses that keep students from timely graduation and transfer because either multiple attempts are required for students to successfully complete the course or the placement exam used almost exclusively to place students in mathematics, places students at lower levels than placement using multiple measures would. With the opportunity to use multiple measures available, a decision was made and implemented in Spring 2014 to use multiple measures to “bump students up” into higher placement levels. The intent is that this will help students in two ways. First, by being placed in higher level courses, students will have an immediately shorter pathway to transfer or certificate or degree completion. Second, it is hoped that the placement will be a more accurate placement because multiple measures are used rather than one high stakes test only.

On May 27 and May 28, approximately 25 Bakersfield faculty, staff, and administration from student supportive services, English, Mathematics, and Academic Development convened for two full days of workshops to tackle the issues of what Bakersfield College faculty can do working in concert to help the cohort of 450 students successfully enter BC, identify their own educational goals, and work as efficiently as possible to meet their goals.

Efforts to be made in intentional ways include the following:

1. **Early enrollment in English and Math Courses**
   Counseling department staff will get students enrolled in the appropriate Math and English during the first semester if possible. If not possible, then as early as is possible.

2. **Early Completion of SEPs**
Students will complete both brief and comprehensive SEPs. They will be aided by BC faculty and staff in counseling and other academic areas.

3. Early Classroom Interventions
   a. Faculty participating in the initiative will commit to participate in an early alert system related to academic performance of the students on the intervention assignment by
      i. entering diagnostic and descriptive information related to the student’s performance in SARS and SARS grid, and
      ii. write an Action Plan for each student that gives the student specific instructions to follow (e.g. spend two hours with a tutor going over the test just returned by the faculty member and three hours on new content from class lectures and the textbook to prepare for the next test).
   b. Students participating in the initiative will commit to follow the Action Plan designed for them by their professor(s) within the time frame established by the professor(s).
   c. College resources in counseling, academic supportive services (Math Lab, Student Success Center, Writing Lab and tutoring) will be martialed to meet the needs of students who brings an Action Plan requesting services.

4. Regular Classroom Interventions
   Faculty participating in the initiative commit to using Classroom interventions (#3 above) every other week (week 2, week 4, week 6, week 8, week 10) in at least Weeks 1-10 of the Fall 2014 semester in order to support the student’s success in the first attempt of each course. Participation throughout the semester is strongly encouraged.

Here is an example of how the classroom intervention could work with a description of the roles of the faculty, the student and academic support services.

**Example of Classroom Interventions for Math B 50 Taught by Professor 1**

Fall 2014 Class Schedule: MTWTh
Fall 2014 Test Schedule: Test every other Thursday
Classroom Interventions:
   Test 1 in Week 2, Test 2 in Week 4, ..., Final Exam in Week 16.

**Professor 1:** Prof1 gives and grades the class test just as before in prior semesters. Now, in addition, the faculty member will enter diagnostics of the test in SARS and SARS Grid and write an action plan for each student that earned a C or lower on the test. If there is time, the faculty member may choose to write commendations for students who have
earned an A or a B on the test. Notes in SARS Grid may be seen by other professors of Student 1.

**Student 1:** Earned a 72% on the test. Grade for test: C.

**Action Plan for Student 1:**
1. Take the test and spend 2 hours with a tutor to go over the whole test. What did the student understand? What did the student not understand? Find the needed information in class notes and in the textbook. Write correct solutions for any missed items on the test that did not receive full credit.
2. Spend an additional three hours studying for the upcoming test. Go over questions on homework. Review class notes and textbook information. Complete a practice test at the end of the chapter in the book to prepare for the next test.
3. Upon Completion of each item: Get a signature from the helping tutor (or tutors) and return the Action Plan and attached documents of work done with the tutor to the professor during an office hour OR class (professor’s choice) for review by the professor who then enters comments in SARS grid that Action Plan is completed.

**Goal:** Better grasp of material by student and better grade on next test.

**Student 2:** Earns a 60% on the test. Grade on Test: D.

The Action Plan for Student #2 may be identical to that of Student 1 except for the time commitment.

Spend 5 hours on current test and 5 hours preparing for the next test. Student may also be asked to visit a counselor to discuss preparation for course and additional support services that may be possible and may not have been requested. Student 2 may be asked to review addition, subtraction, multiplication and division of whole numbers 1-50 and fractions and decimals on Plato.

**Student 3:** Earns a 27% on the test. Grade: F.

Action Plan for Student 3 may have an additional component. First, a counseling appointment to identify sources of difficulty may be required. The counselor may review placement, provide guidance to additional support services, and help the student identify non-academic issues that may be interfering with success. The student will still be assigned 5 hours to go over the current test and 5 hours to prepare for the next test. The student may be directed to establish a study group or regular time to do homework individually in the STEM classroom MS 3 and 4 or in the Math Lab.

Action Plans should include specific diagnostics of what the student needs help with and a time estimate for how much time to spend before the next test. In addition to scheduled time with a tutor, students may be directed to spend time with ALEKS, MyMathLab, PLATO, Kahn
Responsibilities of the Participants in the “Make It Happen” Initiative

<table>
<thead>
<tr>
<th>Faculty</th>
<th>Student</th>
<th>Counselor/Tutor/Support Staff</th>
<th>MIH Initiative or Program Director</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plan and hold intervention</td>
<td>Attend class every day</td>
<td>Counselor Only: Review SARS Grid for a student coming to you</td>
<td>Facilitate MIH events</td>
</tr>
<tr>
<td>Write Action Plan</td>
<td>Read and follow action plan as directed.</td>
<td>Fulfill requirements of Action Plan per directions.</td>
<td>Communicate with Participants individually and as a group</td>
</tr>
<tr>
<td>Enter information in SARS and SARS Grid</td>
<td>Review SARS grid. Meet with faculty member in office hours and tutors as directed.</td>
<td>Communicate directly with professor if more direction is needed.</td>
<td>Review SARS grid to look for overall patterns by student and across students</td>
</tr>
</tbody>
</table>

FAQs:

1. **Why is the Action Plan important?** The student is struggling. He/she needs direction. The Action Plan will give specific and necessary recommendations. If followed, the student will see improvement in scores and in success in the course EARLY enough to have success in the course itself at the end of the semester. A student without an Action Plan handed to him/her, may be less likely to pursue needed intervention in time.

2. **Why is faculty participation in entering information in SARS and the SARS grid important?** With widespread faculty participation, the Bakersfield College faculty in multiple departments will have a better view of each participating student. Is the student struggling in all his/her classes or struggling in Math only? Is the student successful in any subject? How might the college resources be aligned to provide support for a
struggling student? Is a student being asked to do more than is physically possible when all courses are examined in SARS. Should a review of and change in placement be made to enable a student who is earning a low F be placed in a lower class EARLY in the semester in an attempt to salvage the opportunity of success in a first semester college experience and avoid establishing a pattern of failure?