Leading to Action

Report on findings from Campus Leading Indicators analysis

Edward Sullivan, Ph.D., Assistant VP for Institutional Research and Analytical Studies
Edgar Trotter, Ph.D., Associate VP for Undergraduate Programs (Acting)
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California State University, Fullerton investigated the factors related to one-year retention rates of first-time, full-time freshmen using an adapted version of The Education Trust Leading Indicators model. We identified pre-leading indicators that predict the outcomes observed in traditional leading indicator items. By identifying the pre-leading indicators, we are better able to develop policies, support systems, and programming to improve first-year freshman outcomes. The need for remediation, parental education level, and student academic quality (measured by entry characteristics) provided a strong lens on the traditional end of year-one leading indicator measures. Campus efforts and opportunities to offset deficits known at the point of entry were discussed.

Campus Context

California State University, Fullerton was founded in 1957. It is a large four-year, primarily nonresidential, comprehensive university. In fall 2010, it had the largest CSU enrollment and fourth largest enrollment in the state of California. The university is number one in California and fifth in the nation in baccalaureate degrees awarded to Hispanic students. The campus also is fifth in the nation in baccalaureate degrees awarded to minority students. The first-time, full-time freshman six-year graduation rate for the most recently reported graduating cohort (entering fall 2004) was 51.4%. Annually, the campus enrolls nearly 4,000 new first-time freshmen with Hispanics composing the majority of our underrepresented minority (URM) category.

Challenges

For the past decade, one-year retention rates for first-time, full-time freshmen have hovered around 80% and two-year retention rates around 70%. The one- and two-year retention rates for URM students have lagged the non-URM rates by approximately five percentage points during that same period.

In reviewing the fall 2009 first-time full-time freshman cohort, 51% (61% of URMs) needed math and/or English remediation in their first fall semester.

	URM		Non-URM		Total	
Remedial Need Fall 2009	HC	% Column	HC	% Column	HC	% Column
Needed English and Math remediation	**421**	**26%**	**240**	**11%**	**661**	**17%**
Needed Math remediation	**138**	**9%**	**121**	**5%**	**259**	**7%**
Needed English remediation only	**423**	**26%**	**610**	**27%**	**1,033**	**27%**
No remediation required	630	39%	1,262	57%	1,892	49%
Grand Total	**1,612**	**100%**	**2,233**	**100%**	**3,845**	**100%**

Fifty-two percent (72% of URMs) would be the first generation in their family to earn a college degree.

Parent Education Level	URM		Non-URM		Total	
	HC	% Column	HC	% Column	HC	% Column
Parent Graduated College	343	21%	1,208	54%	1,551	40%
Parent Attended Some College	**473**	**29%**	**549**	**25%**	**1,022**	**27%**
Student is First Generation College	**693**	**43%**	**271**	**12%**	**964**	**25%**
Unknown	103	6%	205	9%	308	8%
Grand Total	**1,612**	**100%**	**2,233**	**100%**	**3,845**	**100%**

Thirty-four percent (46% of URMs) are Pell recipients.

Pell Status	URM		Non-URM		Total	
	HC	% Column	HC	% Column	HC	% Column
Pell	**743**	**46%**	**546**	**24%**	**1,289**	**34%**
non-Pell	869	54%	1,687	76%	2,556	66%
Grand Total	**1,612**	**100%**	**2,233**	**100%**	**3,845**	**100%**

Pell status did not seem to have differential impact within the URM and non-URM groups in terms of retention when other factors are considered. Math status appears to have a greater impact on retention rates within both the URM and non-URM groups. Based on the retention findings related to mathematics status, Pell status influences were not pursued in this study.

Math Status at entry by Pell Status:	URM		Non-URM		Total	
	One-Year Retention Rate	% Retained to Spring YR 2	One-Year Retention Rate	% Retained to Spring YR 2	One-Year Retention Rate	% Retained to Spring YR 2
Pell	**82%**	**82%**	**86%**	**85%**	**84%**	**83%**
College Math Ready (national tests)	89%	86%	91%	91%	90%	89%
College Math Ready (CSU tests)	91%	89%	89%	85%	90%	87%
Remediated Summer	83%	83%	84%	76%	83%	81%
Remedial Fall	73%	74%	69%	72%	72%	74%
non-Pell	**80%**	**79%**	**87%**	**86%**	**85%**	**84%**
College Math Ready (national tests)	86%	85%	90%	89%	89%	88%
College Math Ready (CSU tests)	84%	81%	87%	85%	86%	84%
Remediated Summer	88%	88%	90%	89%	90%	89%
Remedial Fall	67%	67%	73%	74%	70%	70%
Grand Total	**81%**	**80%**	**87%**	**86%**	**84%**	**83%**

Twenty-four percent of the fall 2009 first-time full-time cohort enrolled in remedial math in the fall semester of their first year (35% of the URM cohort and 16% of the non-URM cohort). Data show that fall remedial math students are retained at lower rates than non-remedial math students. They also rarely complete 12 or more collegiate units in their first semester and are less likely to pre-register for the spring semester of their first year in college.

Remedial Need Fall 2009	URM		Non-URM		Total	
	One Year Retention Rate	% Completing 12 or more Collegiate Units	One Year Retention Rate	% Completing 12 or more Collegiate Units	One Year Retention Rate	% Completing 12 or more Collegiate Units
Needed English and Math remediation	**69%**	**3%**	**72%**	**11%**	**70%**	**6%**
Needed Math remediation	**72%**	**19%**	**73%**	**35%**	**73%**	**26%**
Needed English remediation only	84%	43%	88%	53%	87%	49%
No remediation required	89%	85%	90%	90%	90%	89%
Grand Total	**81%**	**47%**	**87%**	**69%**	**84%**	**60%**

Campus Leading Indicators Study

The fall 2009 first-time full-time freshman cohort was examined using a leading indicators style approach to include Pell status, remediation status, academic quality, family education experiences, registration behaviors, college-unit completion, retention outcome, academic status, math completion, grade point average outcome, and other variables.

Concerns about first- and second-year retention led us to focus on the relationship of remedial activities to freshman success. The campus has a long standing effort to provide opportunities for students to complete remedial needs during the summer prior to their first fall semester of college. In 2012, the CSU will require through a newly created Early Start Program all students to begin any needed remediation in the summer. The initial thrust of the study sought to find out if students completing math remediation in summer had a retention/success advantage over students needing math remediation in the fall semester.

The results of the math remediation question led us to policy issues related to unit completion/progress to degree. Upon examination, pre-leading indicators emerged that suggested possible support opportunities to improve outcomes.

Math Remediation – summer or fall?

The primary thrust of the study was to determine if students completing remediation during the summer were more likely to be retained than students who delayed their remediation until the first fall semester. This would be expected because students who completed summer remedial math had higher HS GPAs and SAT scores than fall math remedial students. In many cases, summer remedial students had CSU math placement test scores just below the cutoff scores required to be exempted from completing remedial math. The summer math remedial students also were more likely to have a parent who had graduated from or attended college.

Students completing math remediation in the summer were retained into the spring of year two in rates comparable to students who did not have a remedial math requirement; however the non-remedial math course pass rate in fall year 1 for these same students may suggest a need for additional math instructional intervention. URMs are 46% of the summer remedial math students despite being 56% of the students identified as needing math remediation.

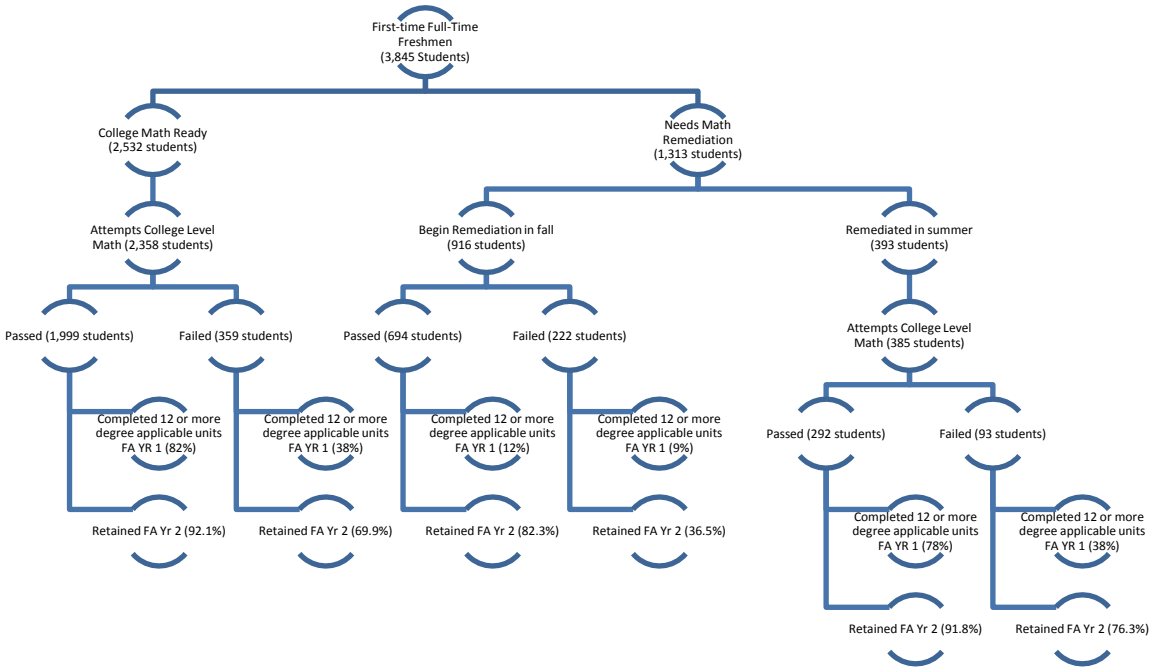
Math Status at entry:	URM		Non-URM		Total	
	% Passing Fall Math course	% Retained to Spring YR 2	% Passing Fall Math course	% Retained to Spring YR 2	% Passing Fall Math course	% Retained to Spring YR 2
College Math Ready (national tests)	76%	86%	80%	89%	79%	88%
College Math Ready (CSU tests)	74%	84%	83%	85%	79%	85%
Remediated Summer	**76%**	**86%**	**73%**	**87%**	**74%**	**87%**
Remedial Fall	**75%**	**71%**	**76%**	**73%**	**75%**	**72%**
Grand Total	75%	80%	79%	86%	78%	83%

Students attempting math remediation in the fall of year one were far less likely to be retained into the fall (71% retention rate) or spring of year two (62% retention rate). Additionally, of the fall remedial math students 25% did not pass their remedial math course attempt (approximately same rate for URM and non-URM) and 88% did not complete 12 or more degree applicable units (93% of URMs and 81% of non-URM). URMs are 61% of the fall remedial math students despite being 56% of the students identified as needing math remediation.

Remedial need Fall 2009	URM		Non-URM		Total	
	% Passing Fall Math course	% Completing 12 or more Collegiate Units	% Passing Fall Math course	% Completing 12 or more Collegiate Units	% Passing Fall Math course	% Completing 12 or more Collegiate Units
Needed English and Math remediation	78%	3%	77%	11%	78%	6%
Needed Math remediation	65%	19%	74%	35%	69%	26%
Grand Total	**75%**	**7%**	**76%**	**19%**	**75%**	**12%**

The flow of our freshman class through remedial and college level math in the fall semester are detailed along with outcomes data related to course success and one year retention rates by category.

Figure 1: First-time Full-time Freshman Math Flowchart with Degree Applicable Units and One-Year Retention Rates



Policy Issues – remedial units do not provide credit/progress toward degree requirements
Forty percent of the entering first-time full-time cohort did not complete 12 or more units in their first semester and were already on track to graduate in more than five years (fall math remedial students accounted for more than half of this group). Fifty-three percent of the URM students did not complete 12 or more units in their first semester and were already on track to graduate in more than five years (fall math remedial students accounted for more than sixty percent of this group). Thirty-one percent of the non-URM students did not complete 12 or more units in their first semester and were already on track to graduate in more than five years (fall math remedial students accounted for more than forty percent of this group).

If we hope to reduce the gap between URM and non-URM graduation rates and to improve overall rates, it becomes necessary to ensure successful starts towards the degree objective including improving the progress students are making towards their degree by completing degree applicable units. Narrowing the twenty-plus percentage point difference between URM and non-URM students degree-applicable unit completion in the first semester would seem to be a good starting point for narrowing the graduation rate gap.

A newly created CSU Early Start Program will require that all students begin any needed remedial activities in the summer before they enroll as a first-time freshman. A pilot of the program will take place in summer 2012 with full implementation the following year. The program is a departure from current practice that provides (but does not require) an opportunity to use the summer to begin and complete remediation. The program should reduce the number of students still enrolled in remedial courses in their first fall semester. It should also provide an opportunity for students to sharpen their English and math skills as they prepare for the academic rigors they will face in traditional freshman year courses.

CSU Fullerton has also been piloting the use of supplemental instruction (SI) in math and biology. It is likely that based on successes in improving successful outcomes in both disciplines, the pilot will be institutionalized. Faculty-trained students who have successfully completed the course lead discussion/problem solving sections to augment lecture/laboratory experiences. Based on existing success rates in initial mathematics courses, it may be worthwhile to expand the SI coverage to include remedial and college-level general education math courses. By lowering the first-attempt failure rates of remedial math students and summer-remediated math students in general education mathematics, it may be possible to improve first-term progress towards degree.

More than half of our entering class (almost three quarters of our URM students) would be the first in their families to earn a college degree. These students enter college with limited familial references to what it takes to be successful in college. Campus efforts focused on the summer and first parts of the fall semester require student (and parent) awareness of the availability and potential value gained through participation. The university is investigating the potential for interventions for students and parents to offset limited family experiences in higher education prior to the summer orientation (and prior to HS graduation) that will increase the awareness that completing remediation early in the academic career (including summer of the first year) has lasting benefits over the collegiate career.

These interventions would stress the importance of testing in spring prior to HS graduation to determine student readiness in math and English. It would stress the importance of starting remediation in

summer, and might also include pre-remedial course workshops in the early summer to ensure success when the remedial course is taken in the second summer session.

Envisioned awareness campaigns will stress appropriate course loads to graduate in four, five, or six years along with the importance of pre-registering for future terms to ensure the best possible course schedule to progress towards degree completion.

In the fall 2009 cohort, first-time full-time URM were more likely to be enrolled in a lower unit load than non-URM during their first semester (40% of URM were enrolled in 12 units compared to 25% of non-URM). It is unclear if this was the result of scheduling advice or scheduling timing (registering at a later orientation limits the courses available to be taken) or personal choice. Regardless, 40% of the URM population (25% of the non-URM) was, on the first day of classes, already not on pace to complete their degrees in four years. More than three-quarters of the URM students enrolled in 12 units were in at least one remedial course (math or English) and thus likely not to be on pace to complete their degree in five years or less.

Leading Indicators – some are known before the first day of classes

The leading indicators approach revealed that many of the traditional indicators noted at the end of the first year can be anticipated at the beginning of the first year. With knowledge that a student needs remediation (particularly math remediation), we can anticipate that the collegiate units earned at the end of the first year will lag those of non-remedial peers and that successful completion of math general education is less likely. Parent education and academic quality indicators (HS GPA and SAT) also provide similar insights.

Fortunately, it is possible to offset the deficits through efforts and programs focused on getting all students to somewhat level footing as they begin their collegiate careers. Efforts focused on the issues needing attention and not on an overly broad categorical grouping will likely provide the greatest benefits. As proportionally larger numbers of students within one categorical grouping relative to the other may have the specific deficit needing attention, some interventions may appear to have a differential impact for a specific group when in fact it just brought a subgroup into line with the skill sets of the overall population.

English remedial students in general education courses like history, philosophy, and biology that require term papers find themselves at a disadvantage relative to peers who have established skill sets. Math remedial students find themselves at a deficit in general education logic and science courses due to less advanced analytical skills. By addressing the remedial needs of our students in the summer prior to the first term of enrollment, we provide level footing for all students in traditional first year courses that require English writing, critical thinking, and analytical ability.

The data revealed that more than half of our entering fall 2009 cohort will be the first generation in their families to earn a college degree. Helping these students and their families better understand how higher education works and of the resources available to help students recognize their potential ultimately should benefit the students and the university. By creating a better understanding of the demands on a college student, we hope to help families understand the potential negative impacts of competing non-college related priorities.

In spring 2011, CSU Fullerton asked our May 2011 graduating seniors to help us better understand the positive influences that helped them achieve their bachelor's degrees. Seventy-seven percent of the

survey respondents who entered as first-time freshmen noted their parents as positive influences (80% of the URM respondents). The next largest positive influences on success noted (mentioned twenty percentage points less frequently) were friends (58%) and faculty in the student major (56%). By reinforcing and potentially creating a family-based support system early in the college careers of our students, we hope to help them better navigate setbacks on the way to their degree.

Concluding thoughts

The leading indicators approach allowed us to look inside our data and find opportunities to improve the outcomes of our students. Through earlier interventions like summer remediation and supplemental mathematics instruction, we expect to be able to offset deficits our students have on the first day of fall classes. The challenges our freshmen face cut across URM/non-URM groupings and are in the end reflections of academic preparation and understanding of the collegiate experience.

The study illuminates the need to do a better job at getting first-time freshmen fully remediated prior to the first fall semester of enrollment to ensure they possess comparable academic skill sets to those of peers in first year courses. We expect that the Early Start Program will increase the number of fully remediated students and as a result will increase the number of students earning 12 or more collegiate degree applicable units in their first fall semester. We further expect that by institutionalizing supplemental instruction, general education mathematics course pass rates will improve and with the improvement we expect to see improved retention (and eventually graduation) rates.

The collaborative relationships at CSU Fullerton allow for the findings of this study and others to move from data to policy to practice in a smooth and timely manner. The collaboration of Academic Affairs and Student Affairs has been very valuable in our graduation rates initiative process. One of our initial innovations involved directly contacting all students from the freshmen cohort who failed to re-enroll in their next term during the priority registration period.

As a result of the efforts we have seen sustained retention gains. We are seeing larger percentages of the fall 2009 cohort retained through the spring of their second year and exiting the second year in good standing (77% for the 2009 cohort compared to the 65% rate of the 2001 cohort). Perhaps as importantly we have seen gains for our largest URM group (73% for the 2009 cohort Hispanic students compared to the 57% rate of the 2001 cohort Hispanic students). Fall 2009 cohort data suggest that we will begin to see a narrowing of the gap between URM and non-URM freshman cohort students. The additional interventions discussed in this study that focus on early success of all of our students will likely further improve the success rates of our students, adding to the narrowing of the overall gap. By focusing on the deficits resulting from preparation prior to the first collegiate fall course, we expect to be able to see sustained improvements in our retention and graduation rates.