DISSERTATION

A RETROSPECTIVE STUDY OF EQUALIZATION FUNDING IN CALIFORNIA COMMUNITY COLLEGES AND ITS ASSOCIATION WITH STUDENT SUCCESS AND STUDENT COURSE RETENTION

Submitted by

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WE HEREBY RECOMMEND THAT THE DISSERTATION PREPARED UNDER OUR SUPERVISION BY KRISTIN M. HOLLABAUGH ENTITLED A RETROSPECTIVE STUDY OF EQUALIZATION FUNDING IN CALIFORNIA COMMUNITY COLLEGES AND ITS ASSOCIATION WITH STUDENT SUCCESS AND STUDENT COURSE RETENTION BE ACCEPTED AS FULFILLING IN PART REQUIREMENTS FOR THE DEGREE OF DOCTOR OF PHILOSOPHY.

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ABSTRACT OF DISSERTATION

A RETROSPECTIVE STUDY OF EQUALIZATION FUNDING IN CALIFORNIA COMMUNITY COLLEGES AND ITS ASSOCIATION WITH STUDENT SUCCESS AND STUDENT COURSE RETENTION

The *Serrano v. Priest* decision is very important in California. In 1971, it was decided by California State Supreme Court in 1971 that California school financing system was unconstitutional under the equal protection provision of the State constitution.

As California public education financing has long had disparate funding levels, the purpose of this quantitative study was to examine the association between equalization funding and student course success and student course retention in California Community Colleges. Archival student success and student course retention data was used for 107 California Community Colleges, and the years reviewed were: Year 1 (2002-03); Year 2 (2003-04); Year 3 (2004-05); Year 4 (2005-2006); Year 5 (2006-07); Year 6 (2007-08). First year of equalization funding was 2004-2005, or Year 3 of the study. Only the Fall and Spring terms were analyzed for each of the years. No summer or intercessions were included in the data calculations. In addition, for the purposes of this study, a college was treated as a funded college if it was eligible for funding for the first year of the equalization program (2004-2005). Conversely, a college was treated as a non-funded college if it was not eligible for additional funding for the first year of the equalization program.

The time-over-change study produced several findings. First, when only looking at two subgroups (funded and non-funded) there was an association between equalization funding and student course success. In other words, the mean success lines became

markedly closer together at the end of the study than at they were at the beginning of the study. Second, when those subgroups were then broken down by multi-campus college districts and single-campus college districts, again there appeared to be association between student success and infusion of equalization funding. What became apparent, however, was the uniquely-shaped lines of colleges in the Los Angeles Community College District, so a decision was made to pull those ten colleges out of the mix. In addition, Basic Aid District Colleges were pulled out of the subgroups. When Los Angeles colleges and Basic Aid District Colleges were pulled out of the mix, there was not a meaningful association between course success and equalization funding. In addition, in all cases, there was no meaningful difference for course retention—on any level.

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...and so now back to scrapbooking, Buffett concerts, crafts, and sleep!

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CHAPTER 1: INTRODUCTION

A Story of Obstacles

Because of varied course offerings and her work schedule, Mary was a full-time student who split her coursework between two different California community colleges. Altogether, she took sixteen credit hours: eight at each of the two institutions which were adjoining college districts. Although the college campuses were twenty miles away from each other, because of her life commitments, the arrangement seemed to work best for Mary.

In order to understand this story and the stories of thousands of other California community college students, it is important to have a basic understanding of the system as a whole. First, all publicly-funded California community colleges were regulated by the California Community College Chancellor's Office, which determined such matters as tuition rates, reimbursement per full-time equivalent student, funded growth rate, and other such factors. One of those regulations included the definition of a full-time equivalent student (FTES), which was defined as a student taking 30 lecture hour equivalents per academic year, or roughly 15 credit hours per semester. Because the system operated on a FTES basis, a student who did not take a full 15 hours per semester at an institution represented less than a 1.0 FTES.

These same colleges, however, were governed by locally elected boards. In other words, while districts were given general principles and regulations to follow, it was up to the locally elected boards to determine where general fund monies were spent.

Same Tuition, Different Funding

Like many California community college students in her geographic area, Mary struggled with juggling family, work, and college obligations. She knew, however, that it was important to pursue her education and worked diligently to balance these objectives. In her job, she made a decent wage, but she wanted something more. She wanted to become a nurse. Her family was financially comfortable and the other family members in the home were employed, so Mary was ineligible for federal financial aid. Mary paid the state-regulated tuition at each of the respective institutions: $20 per credit hour. This semester, Mary was enrolled for eight credit hours at each of the two institutions—Rural Community College (RCC) and Next Door Community College (NDCC). For the eight credit hours at RCC, Mary wrote a check for $160, in addition to miscellaneous college-regulated student fees, such as a health fee and an associated student-body fee. At RCC, Mary represented 53.3% (8 out of 15 credit hours for the semester) of a full-time student, which was state funded at $3,750 per full-time equivalent student (FTES). As such, Mary's attendance represented $1,987.50 in revenue to RCC.

At NDCC, Mary also wrote a check for $160, plus the same types of miscellaneous fees for the eight credit hours she was taking at this college. At NDCC Mary also represented 53.3% (8 out of 15 credit hours for the semester) of a FTES, which has a state FTES allocation of $6,349. As such, Mary's attendance represented $3,384.02 in revenue to NDCC.

Financing California's public community college's has a long history of disparate funding levels, which were originally based on the discrepancies in local property taxes.

At the passage of Proposition 13 in 1978, which will be discussed later in this dissertation, property taxes were frozen and local boards could no longer raise property taxes to benefit college districts in their areas. And, as a result, community colleges were locked into various dollars per FTES at the time of the passage of this legislation. Ten years later, the next funding model was adopted and was called Program-Based Funding, which also will be discussed later in this dissertation. Although this funding mechanism was not based solely on local property taxes, the patterns of funding discrepancies continued.

As we look more deeply into Mary's story, it is important to realize that, while every student who attended a California community college paid the same amount of student tuition, each student represented a different funded amount to a particular college. And, although Mary paid $20 per credit hour at each of the two institutions, Mary was worth 70.27% ($1,369.52) more to Next Door Community College than she was to Rural Community College for taking the same number of credit hours.

To complicate matters even further, not only was Mary's attendance worth a different dollar amount at each of the institutions, the levels of state and local funding that comprised the total value per FTES were different. Remembering that an NDCC FTES was worth $6,349, and a RCC FTES is worth $3,750, Mary was worth $1,987.50 to RCC and $3,384.02 to NDCC. To determine the local and state portions, first Mary's tuition was subtracted so the remaining portion of FTES allocation at each college was $1,827.50 for RCC and $3,224.02 for NDCC. Next, the total FTES which was not funded by the student was combined for each of the colleges. From those numbers, the

aggregate property taxes from the geographic area were subtracted from the total allocation. Lastly, the funds needed to make up the difference between student tuition and property taxes (student and local contributions) received and the FTES allocation were provided from the state treasury. As a result, each district within the California community college system received a different percentage of local, state, and student support.

	$ Per FTES *(Variable: set by state)*	Total FTES *(Variable)*	Total Allocation *(Variable: $/FTES x total FTES)*	Student Fees & Tuition *(Fixed: $20/credit hour)*	Local Property Taxes *(Variable: depending on property value and taxing levels)*	State Contribution *(Variable: based on shortfall from total allocation minus tuition and local support)*
Rural Community College District	$3,750	8,180	$30,675,000	$2,454,000 (8 %)	$15,030,750 (49%)	$13,190,250 (43%)
Next Door Community College District	$6,349	5,020	$31,871,890	$1,506,000 (4.73%)	$12,092,356 (37.94%)	$18,273,624 (57.33%)

Figure 1. Funding differences of Rural Community College and Next Door Community College.

To more fully understand how the system operates, let us look at the bigger picture for each of the two colleges that Mary attended by using Figure 1 alone. With the two districts' disparate funding levels, Rural Community College District had a full-time equivalent student allocation of $3,750 and Next-Door Community College District had a

full-time equivalent student allocation of $6,349. In short, NDCC's funded rate per FTES was 69.3% greater than that of RCC's.

At each institution, students paid the same tuition rate ($20 per credit hour), which is mandated by California's Community College Chancellor's Office. A constant tuition rate, a variable local tax rate, and a variable per FTES allocation, however, also leads to a variable state rate. In this funding model, different percentages of local and state funds made up the total funding level. For instance, in the case of RCC, funds were generated from students (by way of tuition and fees) at a funding level of 8%, while local property taxes accounted for 49% and State funding accounted for 43%. At Next Door Community College, funding was comprised of 4.73% from student tuition, 37.94% from local property taxes, and 57.33% from State funds. All Mary saw, however, was that she spent the same on tuition at each institution. In addition, while the residents of the RCC district supported RCC with more local taxes than the residents of NDCC supported NDCC, they actually received fewer services because of the FTES allocation acted as a funding ceiling for the district.

Constituency Misperceptions

Because California community college funding levels and structures are not seen by the citizens of the state, they are not able to understand how Next Door Community College could spend so much money on student support services such as advising, counseling, and tutorial services, while Rural Community College appeared to be less proactive in their student success and student retention initiatives because of funding levels. On a smaller scale, students like Mary who attend both colleges, do not

understand why Rural Community College had offices which were open fewer hours and why there were fewer services to support student life and learning than offered at Next Door Community College. She was told it was because of budget issues, but in her mind she didn't understand how NDCC could have the funds to provide more services, but RCC did not.

As the disparity between different colleges' support for such services became greater and more obvious, there was a public outcry from the citizens of the Rural Community College district. They did not understand why their sons and daughters had to travel to NDCC to get an education at an institution, which, according to its public relations campaign, offered more services and had a better public image. The citizens wondered why RCC was not competitive in the types and amounts of services it offered to support student success and student retention —including counseling, early alert systems, mentoring programs, faculty advising, specialized tutorial services, and programs targeted to helping students maneuver through the college process. Were instructors and administrators being paid too much? Were funds being expended inefficiently? What was happening?

Although California community college financing was sometimes difficult to understand, the staff at Rural Community College took it for granted that they had conveyed the message to the public. The administration and faculty had written newspaper and newsletter articles and published various collateral materials explaining the different funding mechanisms. Still, the public did not understand why different colleges should receive different amounts of money for the same FTES. In short, the

faculty, staff, and administration at RCC had failed to realize that this part of their public relations campaign should have made it clear that the college could not offer as many of the services that NDCC offered, because of the significant difference in funding levels.

In the meantime RCC was criticized for its business practices, its perceived failure to focus on students, and its perceived lack of proactive behavior. The citizens were becoming more and more disenchanted with the college. Many students were turning to NDCC to meet their their educational needs. They were willing to drive the extra distance to attend the neighboring community college, so they too could receive the added services. This change in behavior caused enrollment levels at Rural Community College to decline. A vicious cycle began. Not only did RCC received less money per FTES, but RCC also had less revenue available for recruitment and student support services. As a result, RCC enrolled fewer students, which eventually brought even less revenue to the college.

Rural Community College had to survive. The faculty, staff, and administrators looked for ways to do more with less, but because tuition could not be raised and funding levels were inequitable, there was little hope in matching the services that Next Door Community College provided. The simple fact was that RCC did not have the same dollar amount per FTES to provide the same services for students.

Purpose of the Study

Although Mary's story is fact-based fiction, it accurately represented what happened in California for many years before equalization funding was implemented. The story also represents the challenges that the community college system's faculty, staff, and administrators faced. In short, public education financing within the state's system has long had disparate funding levels, which were originally based on the discrepancies in local property taxes (Murphy, 2004). In addition, individual district funding levels and the sources of those revenues varied significantly.

Many of the California community colleges started as a continuation of a Kindergarten–Grade 12 (K-12) institutions. The districts' move from K-12 intuitions to K-14 organizations, which included community colleges, provided the starting point for the disparate funding in community colleges—just as it had been in K-12 institutions. Because each of the K-12 institutions was funded differently, the decision in *Serrano v. Priest* became very important. This case was decided in the California State Supreme Court in 1971, and it found the California school financing system was unconstitutional under the equal protection provision of the State constitution (Dowd, & Grant, 2005). The court said that educational resources provided to students depended on the wealth of the surrounding neighborhoods, and that this was a fundamentally unjust arrangement, which stemmed from the tradition of local control and local financing. This subject is discussed in the literature section of this dissertation.

In 1917 California adopted the Junior College Act, and this provided for financial support for mechanical and industrial arts, household economy, agriculture, civic

education, and commerce and this started the creation of two separate systems: a pure K-12 system and a community-college system (Nussbaum,1992). When the community college system became separate, each community college not only had different funding levels, but also each district had a different amount of state aid. This was because the total allotted amount per FTES was comprised of tuition and local aid, which was based on total property tax valuation—or the level of property taxes provided by the landowners in the district.

Funding of community colleges has a long and varied history in California, which is explained in the Literature Review section. The purpose of this dissertation was to analyze the association between equalization funding and student course success and student course retention. To do so in Chapter 2, I reviewed community college finance issues, California Community College funding structures and the latest trend in equalization funding. After this background, I present equalization funding and its association with student success in courses and student course retention from various factors for which data were available.

While many factors could affect student success and student retention positively or negatively, this study identified trends or patterns that showed if they were associated with funding levels. This retrospective study reviewed the academic years of July 1, 2002, through June 30, 2008. Beginning with the academic year of 2002-2003, the study included two years prior to the new equalization-funding model which began in the 2004-2005 academic year. This study reviewed the influx of equalization dollars and looked at the association with student success and student retention.

Definitions

Although several terms already have been defined, it is important to make clear the terms used in this dissertation. First, it is important to determine that this paper looks at two different subgroups of California community colleges—non-funded and funded colleges. When the equalization program was instituted in the State in 2004-2005, there was a three-year plan to bring all colleges to the 90% percentile of the highest FTES allocation in the state. For puposes of this paper, a non-funded college is a college that did not receive funding for year one of the equalization program. A funded college is an institution that received additional funding under the equalization program.

Second, in accordance with the California Community College Chancellor's Office, student course success is defined as the percentage of the total number of student enrollments with a grade of A, B, C, or Credit as the numerator and, as the denominator, the total number of enrollments with a grade of A, B, C, D, F, Credit, No Credit, Withdrawal, or Incomplete. In other words, this percentage evaluated the total percentage of students who passed courses with a grade of A, B, C, or Credit. Course retention rate was defined with the total number of enrollments with a grade of A, B, C, D, F, Credit, No Credit, or Incomplete as the numerator; the denominator was the total number of enrollments with a grade of A, B, C, D, F, Credit, No Credit, Withdrawal, or Incomplete. Students who were retained successfully in a course did not receive a grade of Withdrawal.

Third, California community colleges are regulated by the California Community College Chancellor's Office for tuition rates, reimbursement per full-time equivalent

student, funded growth rate, and other such factors. One of those regulations also included the definition of a full-time equivalent student (FTES), which in its simplest form is defined as a student taking 30 lecture hour equivalents per academic year, or 15 lecture hour equivalents per semester. Each district within the California community college system is governed by a board that sets local policy within the guidelines mandated by the State Chancellor's Office.

The fourth set of definitions that are critical are vertical and horizontal equity. Horizontal equity ensures that there is equal funding for students with equal needs (Dowd & Grant, 2006). Vertical equity provides greater resources for students who have greater needs—meaning that more financial aid is available for students with more unmet need. Horizontal and vertical equity do not represent equitable funding. In short, equal funding is considered fair when students have equal needs, but unfair when they have different levels of needs. Vertical equity is achieved when more public resources are given to less affluent communities; if greater resources were given to affluent communities, vertical equity would be undermined. In addition, there needs to be the same level of public resources given to communities with similar types of affluency, thus achieving horizontal equity.

The fifth topic addresses funding mechanisms of California community colleges. These institutions have a long history of different funding levels per FTES. Not only are the per FTES funding levels different, but because there is a fixed tuition rate per unit, and a variable local aid contribution which comes from local property taxes, there is also variable state aid for each of the colleges. It is important to note that this has long been

the case in the California system, and, with the passage of Proposition 13, which limited property taxes, and served as a local aid cap, districts could no longer raise extra local revenue without the support of a two-thirds majority of the people. Proposition 13 was passed in 1978 as a constitutional amendment that rolled back assessed values on real estate (both personal and commercial) to the appraised values of March 1976 (Tollefson, 1997).

The sixth topic includes the definition for negative, flat, and positive slope. A negative slope is defined as a slope line which is more negative than -0.01. A flat slope line is defined as any slope between -0.009 and 0.009. A positive slope is defined as a slope greater than 0.01.

Seventh, each college is part of a either a single-campus district or a multi-campus district. While there is a long process that explains how a district is granted permission by the Chancellor's Office to increase the number of colleges, ultimately, that office determines whether a college is a multi-campus district or a single-campus district. In other words, some of the districts in the State are multi-campus districts, meaning they have two or more college campuses or centers associated with the same district. Other districts are single-campus districts, where there is only one college in the district.

Research Questions

This research reviewed each institution's equalization funding, student success, and student course retention data. Questions were based on change-over-time patterns,

student success, student course retention, and multi- or single-campus district status. The following are the research questions addressed:

- College Student Course Success
  - By looking at the empirical growth plots for each college, how did the success scores of each college change over time?
  - After dividing the total population of all colleges into two groups (non-funded and funded), and superimposing fitted trajectories on to each of the college's empirical growth plots, what were the slopes and R^2 ranges for the success graphs of each college? How did the two sub-populations (non-funded and funded) compare to the overall average?
  - What was the frequency of success slopes for both subgroups (non-funded and funded)? How did the individual plots compare to the overall sub-populations for student course success? What were the success means, maximums, and minimums for each of the sub-populations, and how did they compare to the other sub-populations?
  - After further dividing the two sub-populations (non-funded and funded) into four sub-populations (multi-campus and single-campus district colleges), what was the frequency of success slopes for all four of the subgroups? How did the individual plots compare to the overall sub-populations for student course success?

What were the success means, maximums, and minimums for each of the sub-populations, and how did they compare to the other sub-populations?

- College Student Course Retention
    - By looking at the empirical growth plots for each college, how have colleges' course retention scores changed over time?
    - After dividing the overall population of all colleges into two groups (non-funded and funded), and superimposing fitted trajectories on to colleges empirical growth plots, what were the slopes and R^2 ranges for each of the colleges retention graphs? How did the two sub-populations (non-funded and funded) compare to the overall retention average?
    - What was the frequency of retention slopes for both subgroups (non-funded and funded)? How did the individual plots compare to the overall sub-populations for student course success?
    - What were the retention means, maximums, and minimums for each of the sub-populations, and how did they compare to the other sub-population? After dividing the two populations into four populations (multi-campus and single-campus district colleges), what was the frequency of course retention slopes for all four subgroups? How did the individual plots compare to the overall sub-populations for student course retention? What were the

success means, maximums, and minimums for each of the sub-populations, and how do they compare to the other sub-populations? When comparing each individual college's student course success line and student course retention line, which colleges had similarly shaped lines? In multi-campus districts, were there any similarities between the colleges in the district?

Study Limitations

This project used data from the California Community College Chancellor's Office website, including a compilation of data from each of the institutions in the system. The system office was specific regarding the information required from each individual college and individual district funding was dependent on appropriate data collection. As such, each college paid special attention to gathering appropriate information for reporting purposes.

While each college gathered information through different enterprise reporting programs, the final data reported to the State must fit specific parameters. The data submitted were verified by the California Community College Chancellor's Office and verified in the annual audit of each district by independent auditors. It is recognized statewide that, while the Chancellor's Office has been trying for 15 years to acquire reliable data to be used for comparison purposes, it was only after 2000 that the data were considered reliable enough to compare among colleges. In addition, no information is available on why specific data were collected by the Chancellor's Office, except that

legislation was once put in place to determine specific information upon which to base funding. Based on that, data were collected and funding followed.

Overall, the data collected through the Management Information Reporting System provided by the Chancellor's Office are collected on a term-by-term basis and combined to create the data for the entire academic year. Not only was the information used for comparisons and budgeting purposes, the Chancellor's Office also incorporated the data into reports to federal agencies, such as the Integrated Postsecondary Education Data System (IPEDS) Report. In addition, the Chancellor's Office makes the data available to the general population on its Data Mart website which is located at http://www.cccco.edu/CommunityColleges/DataMart/tabid/848/Default.aspx. This database, made available through the Management Information Systems office of the Chancellor's Office, was used to provide the various subsets of data including, but not limited to, data under Program Retention/Success Rates. From there, term data were collected for each academic year for each college.

To determine the districts/colleges that received equalization funding, the list of districts which received equalization funding was provided by the Fiscal Policies Office of the Chancellor's Office and found in publications. From there colleges were futher identified as receiving equalization funding (or not eligible for equalization funding) by using information found in the Community Community College Directory produced annually by the Chancellor's Office. Each college was coded as equalization-funded or non-funded.

Because archival data from all community colleges in the state were used, this entire population study does not include a rationale for selection. Thus, there are no reliability or validity measurements. Also, because the entire population was used, it was not appropriate to generalize the findings or to apply any external validity measures.

Significance of the Study

As funding at California community colleges has been changing, this study assessed equalization funding and its association with student success and student course retention. Although there are many reasons why success and retention in the classroom could change, this study associated trends or patterns and provided a basis for future studies and comparisons because California's community college funding structure which changed again in the 2006-2007 academic year with SB361. It is hoped that this study provides the basis for additional studies to examine the impact of future equalization funding structures and provide future researchers the ability to compare the first attempt at equalization funding and its association with student success and student course retention.

This study is significant for a couple of reasons. First, California K-12 schools and colleges have a long history of disparate funding levels as evidenced in the landmark case of *Serrano v. Priest.* Second, the literature illustrated that local financing of California colleges appeared to create revenue disparities that do not promote vertical equity. It was found that differences in state expenditures across the states did affect child outcomes for K-12 insitutions. In another study it was found that when financing to California community colleges in the 1990s was pulled, it reduced the number of transfer

students to both of the public four-year college systems in the State. Given these findings, this study provided additional information regarding the levels of funding and the association with student success and student retention.

Researcher's Perspective

I was interested in understanding whether student success and student retention were associated with the funding structure of California community colleges. In other words, what was the association between student success and student retention rates and the various funding levels for the colleges, which have disparate funding systems? In my opinion, equalized funding is difficult to solve on a Statewide basis. I believe this issue has been slow in coming to the legislative forefront, because there is not 100% consensus on an equitable funding model. Simply stated, those colleges which received a high level of funding per FTES are not willing to agree to less funding per FTES.

As such, community colleges, as a system, have had a difficult time getting the attention of the legislature for funding and other issues involving their students. It is widely known that there is only so much funding available to community colleges in the State, and the colleges funded on a higher level realize that equitable funding jeopardizes their livelihood. Colleges that received higher levels of FTES funding were not interested in supporting equalization funding because the reality was that there was not enough money in the State treasury to fund all community colleges at the higher levels. The colleges that were funded toward the top realized that the funding structure would change to have the lower funded districts receive the same level. In short, those colleges on the top half of the funding structure were not interested in pursuing legislative action to bring

everyone up to the same level. As with so many community colleges throughout the United States, unless a majority of the colleges within a given state supports initiatives, projects seem to lose momentum in the legislative process.

It also is important to know that I currently work for a college that received a funding level nearly half of what a neighboring college received per FTES allocation. Through serving as a member of the management team, I have seen the day-to-day challenges that funding inequity causes, from the inability to offer appropriate services, to competing to attract students in a competitive marketplace. These challenges are all very frustrating, and from an underfunded district's point of view, it is an ever-escalating, uphill battle. In addition, from my perspective if more funds were available to a district, there should be an ability to increase student course retention and student course success, which would even further increase revenues. From a competitive standpoint, our adjacent district has the ability to spend more on marketing, recruiting, outreach, and support services.

As a current Executive Director of a California Community College Foundation and a member of my college's cabinet, I have an interest in the funding structure of community colleges. For my current job, this interest helped identify the needs of the college and how the Foundation can best work to fill those needs. In the long-term, my interest may lead me to a career change.

Lastly, I hope that this research study identified trends in student success and student course retention given the influx of equalization funds into the system. In

addition, I hope that it raised new questions about the various vertical and horizontal equity funding issues in California's community colleges.

CHAPTER 2: LITERATURE REVIEW

To understand how this chapter is organized, the reader can think of it as a funnel. First, it examined community colleges from a broad perspective and reviewed the competition for funding at community colleges regarding services provided for by governmental state funding. In addition, this section reviewed economic theories and comparisons of state community college markets and looked at the issues of the anti-tax movement and inter-district equity. Moving from a national level to a state level, the chapter reviewed how legislation has impacted the funding mechanisms specifically in the California Community College System. Funding mechanisms included the period prior to Proposition 13, after Proposition 13, the period of Program-Based Funding, and, finally, the state's first attempt at equalization funding. The final part of the literature review explored current articles regarding funding disparities and the latter's association with student success and student retention.

The Role of Community Colleges in their Communities

Breneman and Nelson (1981) reported that community colleges are viewed as society's vehicle for continued education and the goal of equality and opportunity. Postsecondary education often exists only because the mission statements of community colleges across the United States insist on continuing to meet student needs. The existence of community colleges created an environment where access, affordability, and transfer opportunities to a four-year college existed. In terms of access, by defining districts and regions where community colleges were developed, the goal was to place colleges geographically so that 95% of the population would be in reasonable commuting

distance to a community college (Cohen, 1999). Many individual districts throughout the United States were created for this reason.

The affordability of community colleges was guaranteed by state subsidies. Community colleges are institutions which were created to be more affordable than private institutions or other public higher education and to ensure that states assume a portion of the cost to maintain affordability.

The cost of having community college education available to students differed from state to state. Although each state varied in terms of how much it contributed to the community colleges' operating and capital outlay costs, all shared a basic commitment to the idea that students should receive the benefits of attending a publicly funded institution. In most states, the burden of funding community colleges was shared by the state and by students in the form of tuition (Cohen, 1999). However, the differences in the levels at which various states contributed to funding community colleges were vast. At one extreme, California offered tuition-free higher education, while at the other, New Hampshire announced its opposition to low tuition (Cohen, 1999).

Competition for State Dollars

Because funding for community colleges was dependent on state funding, these institutions often competed with other publicly supported institutions and public needs. This competition covered four sectors: public safety, medical care, education for kindergarten through high school, and higher education. Competitiveness was reflected in state budget structures, and the increasing costs between the four sectors continued to threaten community college operating budgets. In addition to competition challenges,

state anti-tax and private-benefits movements reduced the ability of community colleges to operate and to sustain their current funding levels.

According to Katsinas (2005), President George W. Bush stated that community colleges had a significant role in educating our population, yet this did not translate into protection of current funding levels, much less funding for growth opportunities. Although the primary responsibility for financing community colleges fell on state, local, and student support, grant funding or other special fundings were available at the federal level. In addition, programs such as the Hope Scholarship were intended to assist students in attending college. Dowd (2006) reported, however, that the Hope Scholarship has not done as much for low-income students as it has for middle-class students.

To further support this claim, in the late 1960s and early 1970s funding for K-12 and higher education totaled over 50% of total state spending (Katsinas, 2005). By fiscal year 1996, however, funding had fallen to 23% of total state spending for K-12 education and 10% for higher education (Johnson & Katsinas, 1998). Funding levels rose slightly by 2002—to approximately 11% of total state spending for higher education—but were still behind funding for both K–12 education and for Medicaid (National Governors' Association and National Association of State Budget Officers, 2003).

In a report that looked at funding percentages from the perspective of higher education, Breneman (2005) asserted that in 1979 state governments provided 50% of the operating support for state universities; however, by 2000 that share had dropped to 35% nationally, and for many research universities the figure declined to less than 20%. He also reported that public university leaders, who used to support higher state

appropriations and lower tuition, had become proponents of high tuition and large amounts of financial aid. What caused this? Katsinas (2005) noted that "dramatic increases in spending for health care, corrections, and K–12 education, along with long-term declines in sales tax revenues, have created structural deficits in many state budgets" (p. 21).

Changes in the state budget structures also took a toll on community college budgets, especially during recessionary times. Katsinas (2005) reported that before 1980, when K–12 and higher education received over 50% of total spending, state leaders responded to recessions by "flat-funding," whereby every item in the state budget, including education, was subject to such actions as limiting employee pay increases, cutting spending where possible, and postponing capital expenditures. Educational institutions raised tuition and the state imposed other fees or temporarily increased taxes (typically sales taxes) to reduce any other budget disparities.

Kane and Orszag (2003) also looked at the issue of competition. They analyzed Medicaid and higher education budgets in every state from 1980 through 1998 and suggested that each new dollar spent on Medicaid took 6 to 7 cents out of every dollar spent on higher education. This being so they believed that in times of economic downturn higher education was more vulnerable to cutbacks than almost any other state-supported sector. State leaders increasingly were forced to choose which among their commitments they could keep: offering a high-quality public education to all students despite tight budgets and rising enrollments or trying to keep tuition low for state residents regardless of their ability to pay (Kane, 2005). The anti-tax movements also put

pressure on state budgets during recessionary times because of the unwillingness of the taxpayers to support an increase in taxes (Katsinas, 2005). In fact many states passed legislation making even temporary tax increases more difficult to institute quickly. Consequently, states had a more difficult time in overcoming the obstacles of ebbs and flows in the economy by temporarily raising taxes. As a result recessions hit public education harder than they did other sectors, because in times of recession the states could not protect the operating budgets for public higher education (including community colleges) (Katsinas, 2005). An example was California's passage of Proposition 13, which limited the amount by which taxes could be increased without a 2/3 vote of the people. This will be explained later in this chapter.

The factors of recessionary times, more competition for the dollar, and the anti-tax movements affected community college funding. The need for funding, however, also was determined by the demand for community colleges. Katsinas (2005) reported, "Prior to the 1980s and the advent of the information age, a general rule of thumb was that enrollment at community colleges was inversely related to employment levels" (p. 26). In other words, when economic times were good, people worked for good wages rather than enrolling in a community college to continue their education and training. When economic times were bad and revenue through state funding was limited, unemployed workers furthered their education and training at community colleges. This pattern often reflected a manufacturing-based economy in which workers with high school diplomas could obtain well-paying, unionized jobs and enter the nation's middle class. In the so-called "new economy," based primarily on information processing, there were longer

periods of sustained unemployment and job loss. In other words when the economy was good and the tax base was larger, fewer students attended community colleges so theoretically there were fewer resources needed (i.e., number of classes); however, when the economy was in a downturn, community college enrollments went up and there was more need for overall funding to serve the increase in student demand.

Recessionary times and declining state revenues also made financing publicly funded higher education systems more difficult. Katsinas (2005) reported that the higher education system typically received state funding only after other major programs (Medicaid, public safety, and K-12 institutions) had been funded by the state. In addition, the tax-limitation movement and the rise of the private benefits model of higher education produced state budget deficits. New ways had to be found to fund community colleges' operating budgets. No longer were community colleges totally state-supported; now there was a higher percentage of local funding during these years.

In Breneman et al. (2003), McPherson and Schapiro reported that state budget volatility would likely continue, as would the competition with other public sectors. Public colleges and universities would receive a smaller percentage of the state funds they once enjoyed. According to McPherson and Schapiro,

> [in] 1980, state and local spending on public colleges and universities amounted to 62% of their educational and general revenues; by 2000 that figure had fallen to 51%, with the federal government providing an additional 13%, mainly in the form of research support. (paragraph 2)

The authors stated that public institutions would try to solve their financial problems by increasing tuition.

In the same article McPherson and Shapiro argued that college administrators needed to do a better job of educating the population about what "limited state appropriations" means to consumers. In other words, the public had to understand that in the short term either colleges would have to depend more on tuition revenues or else the quality of education would decline. The public needed to be aware that if tuition stayed the same or decreased, it would have a negative impact on such issues as class sizes, course offerings, and the number of years that it would take to earn a degree. Second, the authors indicated that states and public colleges must work to protect the socioeconomic groups that were most tuition-sensitive. In other words the system must work to make sure that the poorest people in the community received tuition assistance before those with greater means. McPherson and Shapiro theorized that the public was best served by protecting these students in times of rapid tuition increases. Finally, the authors stressed that public colleges and universities should be better protected throughout the business cycle. Toward this end, they recommended (1) encouraging colleges to put resources aside in a good year, without jeopardizing the subsequent year's appropriations, and (2) requiring colleges to design multi-year budget plans based on realistic expectations.

The balancing act of providing funding for community colleges in addition to the other state-supported entities was difficult and only one of the challenges. Once the state-supported funding was determined, other factors weighed into the total funding for these institutions. These included: what portion of the total funding for community colleges came from state or local coffers; what portion was derived from the student in the form of

tuition; what portion of student tuition should be offered in the form of federal financial aid; and what was the best mix of each.

Student Tuition, Student Aid, and the Impact on State and Local Financing

When determining the best mix of state support, local support, and tuition, it is important to understand the financial models behind public financing of community colleges and some of the implications associated with each model. Although there were several variations of these models, this discussion first looked at the two most frequently debated tuition models: low tuition/low aid and high tuition/high aid. The second portion of this section reviewed models that, while founded on a tuition model, embodied a different idea about how to finance student tuition.

Breneman and Nelson (1981) stated that the choice between "the traditional (low tuition/low aid) and a higher tuition/high aid strategy rests on an evaluation of the equity effects on the persistence of the nonprice barriers" (p. 110). The crux of the low tuition/low aid and high tuition/high aid debate was determining which would have a larger impact on community college enrollment. The question was: are students likely to drop out or not enroll even with low or no tuition because of remaining barriers such as family commitments and lack of motivation, or would prospective students be persuaded to attend college by a lowered price?

In 1977 Garms recommended that tuition should cover 50% of the community colleges' operating costs. However, controversy arose when Breneman and Nelson (1981) publicly disagreed with Garms suggesting that that only 33% of the operating budget needed to be covered by tuition. They argued that a lower tuition model helped

attract lower income students to community colleges. Economists frequently advocated the higher tuition/higher aid strategy on equity grounds that a low tuition policy provides subsidies to all students and therefore redistributes income in the wrong direction (Romano, 2005). If, however, there is high tuition for all students, then financial aid is targeted at students who can least afford to pay tuition. This model is said to be more equitable because needier students benefit more.

Breneman and Nelson (1981) suggested that other considerations be included, such as the recognition that there were public benefits to be gained from an educated population, and an appropriate level of tuition would presumably be less than the full cost. Since there were still significant individual benefits of a community college education, some sort of tuition fee would be appropriate. The authors argued that if the higher tuition/higher aid strategy were considered more equitable, a rare opportunity would exist to improve both equity and efficiency with the same policy change.

Although this dissertation engaged the two main funding strategies of high tuition/high aid and low tuition/low aid, two other opinions were studied. First, Kane and Rouse (1999) suggested that an alternative to current funding could be making loans to students. (A variation on this suggestion is Kruger and Bowen's [1993] idea that repayment should depend on future earned income.) In discussing state, local, and tuition contributions to higher education, Kane and Rouse reported that 62% of current revenues in community colleges were funded by state and local governments: "Because students must be enrolled at least half-time to qualify for many federal aid programs, only a quarter of community college students receive state or federal grant aid to help cover

the cost of tuition" (p. 79). Federal funds were derived from a backward-looking system, meaning that the parents' income was used to determine student eligibility for financial aid. This system was more appropriate for the students in a traditional college and was not as well suited for community college students (Kane & Rouse, 1999).

Kane and Rouse (1999) suggested that an alternative to current funding could be in making loans to students and Kruger and Bowen (1993) suggested that repayment should depend on future earned income. This model rest on the foundation that students will have greater ability to repay student loans after the completion of their degree or certificate. As such, and dependent on the salary which a student will earn after successful completion of their program, incurred student debt will be a contingent-on-income loan is lower than the cost of the same dollar in higher education appropriations.

In addition, Romano (2003) argued that state subsidies should cover 30% to 40% of tuition, rather than the 21% that was the national average in 1998-99. In 2005 Romano adapted his larger study to apply to public funding policies of community colleges. He reported that instead of keeping tuition low in order that it be equitable for low-income students, financial aid to such students should be increased. He noted that keeping tuition low subsidized the education of the rich at the expense of the poor rather than assisting the poor in making college education a reality. He supported this theory by pointing out that community college students are often from affluent segments of the population. Romano asserted that

> to the extent that the state and local taxes used to support the community college are paid by lower-income families and are not used by them proportionally in attending, there is a redistribution of income from lower to higher income groups. (p. 35)

He therefore concluded that a low-rate tuition policy inappropriately provided subsidies to *all* students and redistributed income in the wrong direction.

Breneman et al. (2003) agreed and looked at this topic from a different angle. They reported that a survey conducted by the National Association of State Universities and Grant Colleges showed that more than 25 systems reported increasing tuition between 10-20% for the 2003-2004 academic year. In some states tuition jumped as much as 30-40%. The researchers noted that tuition increases raised basic questions about the affordability of and access to higher education for all qualified students. In 2003 Breneman et al. reported that the recent economic downturn had worsened the problem and that changes were needed if higher educational institutions were to maintain quality while continuing to serve students from all economic backgrounds.

Breneman et al. (2003) work addressed different issues on state and student participation in community college funding. Breneman, as the first author, supported state subsidies for low-income students. He suggested that the underlying cause of sharp tuition hikes was old-fashioned and inequitable state revenue systems. In addition he maintained that these systems could not raise enough tax money to meet public expenditure requirements as set forth by the legislature. There were several reasons for this inability. First, the significant tax cuts between 1994 and 2001 cost the states eight percent of their revenue or roughly 40 billion dollars. A second cause was the rapid increase in the cost of Medicaid, which placed a growing strain on state coffers. In the light of these factors, Breneman argued that the crisis in the funding of higher education was not simply part of another business cycle, which would quickly be resolved by

economic growth alone—higher education, he insisted, would always be one of the easiest places for a state legislature to make large cuts. Breneman then tried to show that the best action was to set priorities and focus on the worst cases. Since many high school graduates who came from low-income families would not have the opportunity of attaining higher education, he argued state subsidies should be directed to low-income students based on financial need.

The second author in Breneman et al. (2003), J. P. Merisotis, addressed the issue of tuition differently. Instead of focusing on tuition subsidies for low-income students, he contended that revenue scenarios should be matched with long-term strategic goals. Merisotis alleged that sharp tuition increases sparked creative marketing mechanisms that attempted to differentiate one institution or system from others. For example, in Illinois, public institutions were allowed to guarantee a fixed rate of tuition over four years of college. While this created a slight market advantage for institutions, Merisotis asserted that it would do little to slow the long-term problem of unpredictable tuition hikes. In order to create a public-sector tuition policy, it would be better to set parameters for tuition increases and to develop various revenue scenarios matched to the strategic goals of each institution. Another approach he offered would use multi-year budgeting to soften year-to-year spikes, thus offering a degree of predictability for budgets and tuition levels. In addition, Merisotis proposed that states increase tuition at the rate of the overall state economic capacity as measured by the state's consumer price index and that institutions allow price differentiation by level of instruction and program of study. In particular

allowing higher tuition at the graduate level and in some professional programs would ensure that subsidies for undergraduate education were protected.

Baum, the third author in Breneman et al. (2003), took a slightly different view noting that more need-based assistance would help low-income students in accessing higher education. He noted that tuition was increasing because of the rising cost of educating students and of the waning priority given to higher education in tight state budgets. Because of these factors institutions needed not only to become more efficient but also to increase tuition. Baum contended that these tuition raises would not concern the middle- and upper-income students because most students in those socioeconomic groups would continue to enroll despite higher tuition levels. For low-income students, however, opportunities were reduced. Baum reported, "the solution is to provide sufficient need-based aid to prevent qualified students from being excluded from higher education for financial reasons" (paragraph 4). Instead of focusing on tuition increases states and institutions should focus on available grants and financial aid and reveal the net price that students actually pay for college. He alleged that higher education would continue to rely on general tax revenues and tuition without significant tuition revenues from students who could afford to pay for college because other resources were available to them. In addition Baum declared that states would not be able to finance quality higher education because there would never enough tax revenues to make that possible.

The fourth author in Breneman et al. (2003), Ehrenberg, outlined a two-fold position on tuition increases: community colleges need to compete financially for faculty members and to offset reductions in state support. Because revenue per student had not

increased as quickly at public institutions as it had at private intuitions, Ehrenberg cited a number of economists who argued that front-loading the federal Pell Grant program, by providing more financial assistance to students in their earlier years of college, rather than later in their college career, would encourage students from low-income families to enroll and continue their education. He, however, opposed such a proposal because it would increase the share of federal aid dollars going to proprietary schools many of which offered non-degree, less than two-year programs.

Ehrenberg (2003) asserted this same objective would be manageable if public institutions charged tuition levels that started low and increased at a specified rate (known at the time of initial enrollment) during a student's years in college. This would provide the benefits of front-loading but reduce the share of federal aid funds going to proprietary schools. In addition, if state support declined or increased at a pace slower than needed, higher tuitions for graduate and professional programs, which lead to careers promising substantial earnings, should be charged.

Kane and Orszag (2003) offered three ideas on how to benefit students. First, the authors declared that rather than keeping tuition low state governments should focus on preserving access for low-income students and maintaining the quality of the educational programs of public institutions. The authors agreed with others when they suggested concentrating the majority of state grant money on the first two years of college when many low-income students were still formulating an opinion about whether college offered a worthwhile payoff. If low-income students learn that they do have something to

gain from college, they should be prepared to borrow funds to pay for their final years of college, earn a scholarship, or secure a fellowship.

The second suggestion by Kane and Orszag (2003) was to use a state income tax code to favor loan subsidies for students who remained in the state after graduation. Instead of providing the same tuition subsidy to all students (whether or not they remained in the state after graduation), states could raise tuition and provide a tax credit for those who continued to live in the state to cover some portion of the loan burdens they accumulated while attending college. In addition the tax credits could even be geared for those whose loan payments exceeded a certain percentage of their income thereby offering help to students who were anxious about whether they would be able to pay back their loans.

Third, Kane and Orszag (2003) suggested that programs should be put into place to encourage low-income students to try to get into college, and states should give institutions greater autonomy in creating their own tuition and fee structures. This could include charging different fees for different programs. In all several concepts regarding tuition paid by students and state subsidies of higher education emerged from loan programs to reduced costs depending on level of enrollment. Despite the funding structure, equity and efficiency played a part in the funding of community college systems.

Equity and Efficiency in Community Colleges

Obviously, funding faced many challenges in a community college system from competition with other state funding needs to finding the appropriate way to fund student aid so that qualified, needy students benefited. The mission of community colleges was to serve the entire population by providing its children with various transferable and marketable skills, but this mission coupled with limited resources created some challenges. There was simply not enough money to fund every program at an appropriate level. Breneman and Nelson (1981) contended that this tension reflected many of the basic problems in the economy. As they put it, "the fact of scarcity, the need for trade-offs, the limits of government, costs of inefficiences, and the conflicts between haves and have-nots when the economic pie is not growing" (p 39). This is still the case today. In 2003 Breneman wrote that states and federal governments have limited their options regarding alternatives. He believed that setting priorities is important and the best that can be done is to alleviate the worst-case scenarios. The issue of trade-offs has not changed, and neither, Breneman believed, have the conflicts between the haves and have-nots. He reported that the "most serious problem over the next several years is the likelihood that many high-school graduates from low-income families will be denied an opportunity to enroll in college and earn a degree (paragraph 7).

Because of the limited size of the economic pie, economists have used efficiency and equity to answer the fundamental questions of how resources in the economy should be allocated. In addition, these same principles identified who should receive the benefits through determiningwhat the economy should produce and for whom (Breneman &

Nelson, 1981). Many times this concept of equality of educational opportunities was often recognized as inequity, mostly because equity was a normative concept and subject to various interpretations. In other words, equity was dependent on what lens was used to view the world. Because there was often disagreement on what was considered equitable, it was difficult to say that one view was right and another wrong (Breneman & Nelson). In short, equity looks at assuring that there is equal access and fairness for students into a public education system.

In looking at the theories that provided the most equitable solutions issues concerning fairness and the distribution of income in society were frequently addressed. For instance, Romano (2005) reported although an optimal level of subsidy could not be calculated exactly because income in society was not uniform, using tax dollars to fund higher education in order for everyone to have a fair opportunity to go to college involved making a normative judgment. The value judgment was that community colleges were a tax-financed way to expand educational opportunities to under-served populations. Romano asserted that tax structures, which are more progressive and take a higher percentage of income from taxpayers at the top of the income distribution, were preferred to those that were regressive. An example would be that of the federal tax structure, which is mildly progressive because of the progressive structure of income tax—the more income a person makes, the higher his or her tax bracket. State and local tax structures, however, were often different. These two systems had mainly regressive structures. These revenues of these entities come from property and sales tax revenue streams, which do not consider taxpayers' income. The same tax rate per purchase price

applies; it is a flat percentage. Romano concluded that if higher education is to be financed by tax revenue, the least regressive tax structure is the most equitable—he recommended "using federal funds first, then state, and finally local sources" (p.35).

Because the private benefits could not be separated from the social benefits for each type of education, the method of finance often became a political decision (Romano, 2005). The issue of efficiency is determined by society's deciding whether the benefits of a community college education were worth the cost to the public and if the benefits of both the private and social rates of return were high enough to justify the cost even if students did not complete a degree (Grubb, 1999; Kane & Rouse, 1999; Romano, 1986). As discussed previously, social rate of return is the amount of public good that came from an educated society. As such, some amount of public subsidy to community colleges was justified, aside from equity concerns on the grounds of efficiency. If community colleges were left solely in the hands of private markets, there would not be enough opportunities available at a reasonable cost and, therefore, the product—a community college education—would be under-produced.

Because the mission of community colleges is to provide access to disadvantaged and other nontraditional students, student populations in community colleges are typically from groups that were historically under-represented at other higher educational institutions. Critics asserted that community colleges attracted people from all types of socioeconomic backgrounds, which harmed educational equity because it prevented students from receiving a "good" four-year college education. Community college advocates, on the other hand, maintained that their institutions offered education that was

often "as good as that provided by four-year campuses and is presented in ways more suited to the students' prior preparation and educational needs" (Breneman & Nelson, 1981, p. 93). This sentiment has not changed. In 2004 Boggs reported that in many ways,

> community colleges have come of age. They have changed the paradigm of higher education in the United States from students having to "go away" to college to having access to affordable higher learning and job training right in their local communities. (p. 8)

One goal of the state-created higher education system was to produce equity. To understand equity, it is important to note that Paulsen (2001) referred to the effects of a public policy on "the fairness of the distribution of benefits and costs in society" (p. 96). He held that there were two different types of equity: vertical and horizontal. Horizontal equity was based on individuals in like circumstances being treated fairly and in a like manner by public expenditure and taxation policies. The concept of vertical equity, however, required that individuals in dissimilar circumstances be treated appropriately dissimilarly when applying public expenditure and taxation policies, such as would be the case of funding with economies of scale factors, different costs-of-living in the state, and other factors.

Romano (2005) also discussed the concept of equity. He reported that equity concerns in higher education often revolved around the questions of who benefits from it and who pays for it. Like Paulsen, Romano admitted that a frequently used standard in equity discussions was that equal should be treated equally. That would mean students who had similar abilities and the similar likelihoods of doing well in college were the same, regardless of whether they were from low-income or high-income families. Romano continued that students who were taking parallel programs at a two-year and a

four-year institution should be treated similarly. In addition, the reverse was true. A system should treat "unequals" in a suitably unequal manner. For example, because public subsidies went to primary and secondary schools in districts with widely unequal tax bases, the state might give a greater subsidy to the poorer districts (Romano, 2005).

Dowd (2005) agreed with both Paulsen and Romano in maintaining that underneath the principles of horizontal and vertical equity, equal funding did not necessarily represent equitable funding. Equal funding for students with equal needs created horizontal equity. The concept of vertical equity was founded on the principle that greater resources were appropriate for students with greater needs. In other words, equal funding was permissible when students had equal needs, but unjust when students had dissimilar needs. Providing more public resources to less affluent communities promoted vertical equity. If more resources were provided to affluent communities, there would be no vertical equity. Other disparities were created by "funding strategies" and political factors. Rational funding strategies included cost adjustments for urbanization, economies of scale, and program types, which might create funding disparities for the sake of efficiency. Often, these factors generated disparities in funding per student but added to the concept of equity.

Breneman and Nelson (1981) contended that unlike other public programs where equity was a prime concern higher education subsidies did not contribute appreciably to the current economic well-being of the recipients. Instead, the lifetime income approach was a more appropriate basis for judging education, because it took into account benefits

in the future. To complicate matters, students needed to view net tuition, not posted tuition, as a relevant financial barrier to attending a community college.

Dowd (2004) reported that the issue of equity affected several states including, but not limited to, Oregon, California, New York, and Maryland. Dowd, quoting Gomstyn (2003), noted that in Oregon three community colleges filed a lawsuit asserting that the state's funding formula penalized colleges in wealthier communities. Although the suit was dismissed, the litigants appealed. Quittner (2004b), as reported in Dowd (2004), asserted that in California the ongoing dispute over financial equity was highlighted in the budget process of 2004-2005. At that time there were funding disparities of $1,500 per student among the 15 districts with the highest and lowest funding. Although several factors might attribute the large differences between program costs to institutional economies of scale, demographics, and costs of living, these could not account for the disparities. In New York the financing system was criticized as being disconnected from the mission of the community college system; in Maryland it was decided that the economies of scale factor did not fully account for the inequities in the system.

These examples showed that financial equity and access remain an important part of the public debate. Dowd (2004) reported that state governments were typically responsible for maintaining vertical equity through finance equalization formulas and means-tested aid grants; however, local governments were chiefly interested in their own areas and typically were not concerned with statewide equity.

Dowd (2004) used the IPEDS 2000 Finance Survey data and examined predictors of revenue variation in community colleges in thirty-five states. She found that economic and political factors, as well as student enrollment and state appropriations, were among the factors that played a role in equity funding issues. She also found that it was common for community colleges at the low end of the state funding levels to operate with only half as many resources per student as other community colleges in the state. Second, descriptive analyses of the IPEDS data pointed out that it was common for colleges in the 90th percentile of state revenue distribution to have twice the per-student resources as colleges at the 10th percentile. Third, colleges serving a higher proportion of financial needy students had higher revenues relative to other colleges in their states; however, only 7% of the variation was explained by state funding. Fourth, colleges in small towns and rural areas had revenues 13-18% higher than those in large cities, even when enrollment size and the proportion of part-time students were taken into account. Therefore, the deficit could not be attributed to economies of scale factors.

Redistribution of income is often emphasized in the literature as a measure of economic well-being, as are progressive income taxes, and welfare programs for families with dependent children. This gauge uses a variety of empirical measures to examine changes in the distribution over time and the impact of government taxing and spending policies.

In *Equity and Efficiency of Community College Appropriations* Dowd and Grant (2005) based their research on the landmark case of *Serrano v. Priest*, which was decided in the California State Supreme Court in 1971. The Serrano decision found the California

school financing system to be unconstitutional under the equal protection provision of the state constitution (Dowd & Grant, 2005). The court said that educational resources provided to students depended on the wealth of the neighborhoods in which they lived, a fundamentally unjust arrangement stemming from the tradition of local control and local financing.

Dowd and Grant (2005) reported since Breneman and Nelson's (1981) consideration of community college finance equity and a similar study by Walter Garms (1981), the role of local control in community college finance systems and its effect on equity had received comparatively little attention. Dowd and Grant alleged that this state of affairs might have resulted from a conclusion that community college finance equity was a less pressing issue than school finance equity, because a college education was not compulsory, nor "essential for functioning or succeeding in life" (p. 124). In their conceptual framework Dowd and Grant reviewed national data, characterized variations in community college revenues from state and local sources. They analyzed differences and similarities in state distribution patterns, with and without local-share financing from the perspective of equity and efficiency. Their conclusion was that local funding in community colleges created revenue disparities that disadvantaged the least affluent communities in a state.

The study found that the role of local finance appeared to create revenue disparities that did not promote vertical equity. Local-share states, however, tended to have lower tuition and higher levels of funding from state sources. The authors contended that this might reflect the "efficient" nature of local voters who were supporting their

local colleges. Colleges with a ratio of local appropriations to state appropriations of less than one-half also had the highest levels of revenues from all sources, excluding tuition and fees. Dowd and Grant reported that this correlation suggested that students benefited when local and state governments collaborated in funding community colleges. In researching these topics it was important to understand efficiency in the sense of "technical efficiency" as well as of "allocative efficiency." Romano (2005) explained that "the most common definition of efficiency refers to technical efficiency, known as producing a good or service of a given quality at the lowest cost" (p. 36). Efficiency in higher education may be considered to mean whether or not students get the same quality product at the end and whether the costs of educating students at a community college are greater than at a four year college.

Efficiency is concerned with how society's resources are allocated. Romano (2005) reported that efficiency is concerned not only with the lowest cost alternative, but also in how the resources are distributed and balanced against presumed benefits. While decisions about what to produce control private markets, sometimes this results in either overproduction or underproduction of goods or services. The right mix is called allocative efficiency. An example is the need for public subsidy within higher education. Without public subsidy, higher education would be underproduced and would result in inefficient allocation (Romano, 2005).

Breneman and Nelson (1981) asserted that the concept of efficiency meant more than simply providing goods or services at the lowest cost. Instead, when the total benefits from the production of some goods or services exceeded the total cost of

producing them by as much as possible, the process was said to have an efficient allocation. If the goods cost more than they were worth, or if producing less goods would leave unrealized potential, the process was not considered an efficient allocation. In addition market efficiency was based on looking at the entire population when determining benefits. In other words market externalities might exist and include such things as pure public goods (national defense was the standard example), whose benefits are all publicly and collectively consumed. Also, if the benefits were indivisible and nonexclusive, market externalities might exist. For example, the lack of ability to separate the "good" is created when every person is able to consume the same amount of the public good, and one person's consumption does not reduce the amount available to others. Individual consumers have no incentive to reveal their true preferences or to indicate their willingness to pay for the public good except at the voting booth. Only when there is collective agreement at the voting booth are individuals able to show that consumers' preferences were either objectionable or not feasible.

Breneman and Nelson (1981) emphasized when studying the economic theory of community college financing, importance should be placed on the ways in which market forces push the system should be financed. This should be the case unless government intervention can be justified based on either efficiency or equity. In terms of efficiency, the authors asserted that two conditions could justify such government intervention. The first condition is if the education process possesses public benefits. In other words, if only students benefit from the courses they take, the government should not subsidize their education. If, on the other hand, society benefits from an educated population, the

government should subsidize their education. Second, a sufficient condition existed if a student's higher education would produce public benefits on which the majority of voters placed a positive value.

Equity and efficiency were just two of the economic theories that guided the principles of community college finance. Others theories that proved important for this dissertation include *spillover* and *imperfect capital markets*.

Spillover

"Spillover" is a theory that looks at the effects an educated population has on a community as a whole (Romano, 2005). These were sometimes called neighborhood or external effects. In other words, it is the belief that while education benefits the individual, these benefits are also good for the public. When students invest in themselves by going to college, the benefits to society spill over: crime rates go down, there is more participation in the democratic process, volunteerism in the community increases, and a there is greater probability that people will make productive contributions to society (Romano, 2005).

Although these social benefits were important, individuals often considered only the private benefits when they judged the costs and benefits of investing in higher education. Because these spillovers benefited society, however, the public should offset some of the cost of higher education. Although there was not much research on community colleges specifically, Romano (2005) posited that the same general assumptions could also be used for community colleges. If the theory of spillovers was accepted, Romano argued, there would be fewer subsidies for short-term

training/vocational courses and more subsidies for English as a Second Language and remedial education.

Imperfect Capital Markets

Romano (2005) noted that the underinvestment in higher education was also a result of imperfect capital markets. If capital markets were perfect, students who were in need of funds to attend college could take out a loan and use their future income potential as collateral. However, because financial institutions are unwilling to take such risks, such a system cannot work. Therefore, governmental loan guarantees enable students to invest in higher education. Comparable to the spillover theory, this public involvement of the government in guaranteeing student loans ensures that the public does not under-invest in higher education.

Romano (2005) reported that public subsidies were also important because of students receiving poor information. Kane (1999) wrote that because some students have poor information about such topics as applying to college, maneuvering within the financial aid system, and the cost of attending college without the public playing a role, many students would not be able to see the long-term benefit of higher education and would under-invest in it. Kane advocated front-loading financial aid in an effort to have students experiment with college. He alleged that larger grants during the first two years and smaller grants for the last years of a four-year degree program would assist students in overcoming initial concerns. Romano (2005) reported that "This recommendation seems to have particular relevance to the students on the margin that the community college generally serves" (p.38).

External and Internal Fiscal Environments

The literature contained at least four different perspectives on the external fiscal environment in which community colleges operate. First, Palmer (2005) suggested a slightly lower reliance on state funds than was the case in 1989 when state appropriations for community colleges ranged from 25 to 85%. Kenton, Schuh, Hubba, and Shelly (2004) studied community college funding models and the ways in which they provided similar or dissimilar funding during the period from 1990 to 2000. Their study was based on the suggestion that, in order to know how community college administrators managed revenues, the college's history, institutional culture, and environmental norms must first be understood. The National Center for Education Statistics provided the data for this study through its Integrated Postsecondary Education Data System (IPEDS). The finance study surveyed the years 1990, 1995, and 2000; its population consisted of 244 public, two-year, degree-granting institutions located in ten upper Midwestern states (Kenton et al. 2004). The study compared state appropriations, tuition and fees, and local appropriations. For each revenue source, a one-way ANOVA was used to determine if the models differed significantly from one another. Across the four groups, the mean percentage of revenue by source ranged from 22.1% to 41.8% for state tax revenues, 16.0% to 28.9% for tuition and fees, and 0.8% to 33.9% for local tax appropriations. According to Kenton et al., while all states in all groups realized gains in community college revenue, those that relied most heavily on state taxes enjoyed the greatest overall increase in inflation-adjusted revenues from 1990 to 2000. In states where the funding

level from one source was much less than from the others, community colleges often had to find other sources of funding to maintain appropriate revenue levels.

Although the previous study expressed one thought, Keener, Carrier, and Meaders (2002) offered a different point of view. The authors claim that in a time of declining support from both state and local governments, public community colleges have begun to rely more on external revenue sources for basic operations. Their study examined resource development efforts within the community college arena, both from a grant office and a foundation office standpoint. As such, they reviewed the literature as it pertained to resource development and philanthropy in higher education. A research team from the College of Education, Department of Educational Leadership, Policy, and Foundations, at the University of Florida, in cooperation with development experts from the Council for Resource Development (CRD), developed a survey instrument to gather information about community college resource development efforts (Keener et. al., 2002). The instrument included 60 items and consisted of three sections: college profile, grant development, and Foundation/Private Gift Development. Responses from 373 eligible colleges with a response rate of 38.5% included representatives of different sized schools and different geographic locations. The authors found that (a) resource development efforts within the community college system resulted in substantial external revenue enhancement, which included both private fundraising efforts and grant development from governmental sources; (b) appropriate resources must be allocated and seen not as administrative expenses but rather as investments in a revenue-generating center; (c) fundraising was the result of deliberate, sustained efforts; and (d) fundraising

helped colleges achieve their mission. The authors suggested that resource development would continue to be important because of declining state support (Keener et al., 2002).

Second, trends in revenue streams over time were important. Kenton et al. (2005) determined that when states faced declining revenues in the 1990s, most increased local tax appropriations and tuition. It was important to note that tuition was increased more significantly than local tax appropriations. Watkins (2000) added to this study by examining the years 1989 to 1994. He determined that during this period, funding per full-time equivalent student decreased from federal, state, and local tax appropriations by $96. The revenue, however, increased because tuition and fee revenue increased per full-time equivalent student by $384, accounting for the majority of the increase per student. In addition, governmental grants and contracts increased by $281 per full-time equivalent student and comprised the second largest increase.

The third view was that of tying some state appropriations to institutional improvement or performance rather than to enrollment. Henry (2000) contended that there were barriers promoting the underfunding of community colleges. He asserted that there were four reasons little attention was paid to cost-and-benefit analyses. First, college leaders were unable to make it obvious that community college funding levels were not sufficient. Second, there was no agreement among policymakers about efficient and equitable policies from which state higher education systems might choose in making resource requests and allocation decisions. Third, Henry suggested that there was insufficient, inconsistent, and untimely research identifying appropriate theories of proper

state funding. Fourth, there were no continuous assessments of current funding practices and their effects on higher educational institutions and society as a whole.

Henry (2000) provided a model for a comparator-based approach, wherein there should be a more accountable approach for state funding for community colleges within a state system. Thus, Henry argued that regardless of the model used to justify public support for community colleges, it was imperative that appropriate and detailed facts about public investments be made available to policymakers and society and, in turn, these data would be critical to funding levels for community colleges.

Last, it was important to look at the work of researchers who examined the relationship between institutional autonomy and fiscal state dependence. For example, Garrett (1993) undertook an empirical study to show the relationship between funding proportion and degree of control. Although several authors noted shifts in community college funding structures, Garrett concluded that the level of funding "provided by the primary revenue sources appears to have definite implications for the control of local campuses" (paragraph 21). In addition, Garret found that when state funding was over 50%, it included a centralized governance structure. This finding supported that the level of financial contribution correlated with the level of control. Garrett added, "[T]his implication of this finding is that where shifts in funding occur, specifically to a greater proportion of state funding, a likely consequence will be a shift to greater state control" (paragraph 21). Along the same lines, Garrett concluded that a high percentage of local funding was associated with decentralization, meaning that increased local funding might be accompanied by increased local control.

Comparisons of State Markets and Systems

While federal laws apply to all states, each state has a different approach to funding community colleges. The funding of these community colleges differ. For example in state governments like New York that rely on more progressive tax structures like income tax.(Romano, 2005). There are also states like New Hampshire that rely heavily on regressive structures, such as property taxes.

To compare these state structures, Garrett (1992) conducted a study that looked at two outcomes. First, the governance structure of each state's community college system was determined as centralized or decentralized. Second, Garrett identified the characteristics of the system that might be associated with a degree of centralization of governance structure for the model. To determine these factors, Garrett (1993) looked at four variables that he believed might be associated with the degree of centralization in community college governance structures. The first variable identified whether the governing board was established upon initial enactment of the state system. Second, the degree of state or local control, which related to funding questions. Third, the size of the system had an impact, and, fourth, the time that the state created the community college system played a role.

After analysis Garrett (1993) found that the level of funding provided by the primary revenue sources appeared to have implications for the control of local financing. The study showed that if the state's funding was 50% or over, it was associated with centralized governance structures. When the state had a greater funding role, it tended to

take on greater governance control. Conversely, when there was a higher percentage of local funding, there was a decentralized governance structure.

Anti-Tax Movements

Another impact on state systems was the Anti-Tax Movement. Katsinas (2005) reported that this movement and the rise of a private benefits model of higher education influenced states' capacities to fund community colleges. Such was the case in 1979, when California voters approved Proposition 13, a constitutional amendment limiting property taxes. Katsinas claimed that this was the start of a national anti-tax movement--to decrease the size of government.

Inter-District Equity

In their work Breneman and Nelson (1981) spent some time looking at equity from the point of district or inter-district equity. The authors contended that these types of equity had been central to the analysis of K-12 school finances since the legal challenge of Serrano v. Priest in 1971, which involved differences in school districts' property tax base. The authors also note that both students and taxpayers suffered from inequities in a system that relied on property taxes to support the school system. Breneman and Nelson reported, "Students in low-wealth districts often receive less support per capita than their counterparts in wealthy districts, and taxpayers in low wealth districts must pay higher tax rates if they are to raise comparable sums to those in wealthier districts" (p. 35). The authors affirmed, however, that inter-district equity for community colleges had less impact on community college financing than it did for secondary and elementary schools (though they still considered it a worthy goal of public policy).

Romano (2005) agreed that inter-district equity was less an issue at the community college level. A study by Dowd and Grant (2003), however, reported that if there is a local contribution in the funding structure, the funding differences between community colleges are worsened. They also reported that states that do not have a local funding component have a greater disparity in funding for community colleges. This study lent support to the argument from an equity perspective; local funding for community colleges should be phased out wherever possible because the more local funding that is involved, the more inequity exists between districts. To the extent that community colleges continued to be financed from local taxes, the state should consider equalizing the financial resources available.

According to the philosophy of horizontal and vertical equity, equal funding did not necessarily represent equitable funding. Equal funding was considered just when students had equal needs but unjust when students had disparate needs. Providing additional public resources to less wealthy communities was understood as promoting vertical equity, while providing more resources to affluent communities undermined it (Dowd & Grant, 2005). Dowd and Grant hypothesized that local funding in community colleges created revenue disparities that disadvantaged the least affluent communities in a state. The study demonstrated that significant intrastate revenue disparities existed. The authors posited that often disparities in funding could be created by irrational and political factors, such as cost adjustments for urbanization, economies of scale, and program types as a matter of efficiency.

To draw these conclusions, Dowd and Grant (2005) examined a sub-sample of data from the national 2000–2001 Integrated Postsecondary Education Data System (IPEDS) Finance survey. While the primary focus was on appropriations from state and local governments, this study compared revenue across colleges with different enrollments and analyzed appropriations per full-time equivalent student (FTES). Based on the ratio of local appropriations to state appropriations, colleges were designated into five categories ranging from primarily local-share funded or primarily state-funded.

The results of the study showed that state appropriations were the largest source of all revenues with a mean share of 38% (Dowd & Grant, 2005). The authors reported that the mean value of total revenues from all sources apart from tuition and fees per FTES was $8,230 with a standard deviation (SD) of $3,800. The mean value of state and local appropriations per FTE was $5,180 (SD = $2,440). The median of this skewed variable was $4,740. Average tuition and fees were $1,400 (SD = $717).

The overall study argued that some portion of the revenue disparities might have been due to the location of high-cost programs, but there also could have been differences in the geographic accessibility of students to those programs (Dowd & Grant, 2005). States might have located specialized programs requiring technical facilities at a fewer number of campuses and expected mobile adults to travel to them; however, this might not have been a realistic option for students constrained by work and family commitments. While high-cost programs might have explained some portion of the funding disparities, their location also raised equity issues concerning program access.

It was important to note that Dowd and Grant (2005) analyzed California separately due to the large number of colleges and the state's unique funding system. In using the state funding report of 2000, the authors reported that "districts receive a portion of the 1% countywide property tax based on their proportional share of property tax revenue received from their county prior to tax control (Prop. 13, 1978)" (State Funding, 2000, p. 12). Among other things, the study showed the mean (absolute value) deviation of revenues from the state median was $1,330 per FTE, as compared to $973 for all other states studied.

The Impact on California Community Colleges

Seventy-two California Community College districts representing 108 colleges served 1.6 million students in the academic year 2001-2002 (Murphy, 2004). Although for a number of reasons the missions of these colleges have changed over the years, the system still provides students the opportunity to enhance their job skills, take classes for transfer opportunities, and enroll in for lifelong learning classes. In 1960 California created the Master Plan for Higher Education to "provide an appropriate place in California public higher education for every student who is willing or able to benefit from attendance" (Murphy, 2004, xi).

Although the focus and scope of this chapter is on funding and its relation to equalization funding, it is important to understand the significant legislative changes and policies that have occurred to bring the California Community College System to the funding mechanism, which was the focus of this study. In addition, given research and time limitations, the following history is not fully detailed, but it is specific enough to

give the reader an overview of the legislation and financing structure of the California Community College System.

Table 1

Funding Structure of California Community Colleges

Year	Activity
1849	Passage of the California State Constitution; the legislation is charged with providing education in California (Nussbaum, 1992).
1851	Legislature enacts first school act, which provides for the distribution of state school lands to schools in proportion to the total number of children in the state. The Act also provides for the creation of school districts and authorizes them to levy property taxes and form local governing boards (Nussbaum, 1992).
1852	Each county asked to create a board of school commissioners and the state Board of Education is formed (Nussbaum, 1992).
1855	School districts for each city and town are planned (Nussbaum, 1992).
1863	A board of state and county examiners created to determine qualifications of teachers (Nussbaum, 1992).
1865	A plan for local taxation and trustee election created (Nussbaum, 1992).
1903	Mandatory education for all eligible students; it is now also mandatory to provide education for physically handicapped minors (Nussbaum, 1992).
1907	Statutory authorization for the first two years of university courses—which becomes the community college delivery system (Nussbaum, 1992).
1913	First teachers retirement system created; school buildings made available for use as civic centers (Nussbaum, 1992).

1917	Junior College Act which provides financial support for "mechanical and industrial arts, household economy, agriculture, civic education, and commerce"; Layoff provisions enacted (Nussbaum, 1992).
1921	Legislation passed providing for teachers' tenure, separate community college districts, and bonds for construction of junior college facilities (Nussbaum, 1992).
1933	Field Act enacted, which provided for oversight of school building construction (in response to major earthquake in Long Beach) (Nussbaum, 1992).
1960s	The decade of the first Master Plan for Higher Education. One of the recommendations in this plan is that community colleges be split off from the state Board of Education and form a separate system with its own governing board (Nussbaum, 1992).
1978	Proposition 13 passed. California voters pass a constitutional amendment that rolls back assessed values on real estate (both personal and commercial) to assessed values of March 1976 (Tollefson, 1997).
1979	Proposition 4 passed by California voters. This proposition sets expenditure limits for state and local governments (Murphy, 2004).
1988	Passage of AB1725, which concerns shared governance, full-time/part-time instructor rations, remedial limits, staff development, minimum qualifications, hiring criteria, evaluation of employees, accountability, and management information systems. In addition, program-based funding is one of the components of this legislation (Murphy, 2004).
1988	California voters approve Proposition 98, which amends the state constitution to guarantee a minimum level of funding for K-14 education based on overall state revenue levels (Murphy 2004).
1990	Proposition 111 passed by California voters. This legislation uses three calculations to determine the minimum level of funding to be budgeted in the upcoming year; which calculation is used depends on current

	economic circumstances (Murphy, 2004).

Following this overview of funding for California Community Colleges, it was appropriate to examine three different periods, which are significant in the funding mechanism changes for the state. For the purposes of this dissertation, those periods were: (1) prior to the passage of Proposition 13; (2) after the passage of Proposition 13; and (3) the period when program-based funding changed the funding mechanism and the legislation that instituted Equalization Funding.

Prior to the Passage of Proposition 13

As noted above the 1960 California Higher Education Master Plan established the mission of community colleges to provide instruction through grade 14 to all residents 18 years old or above (Tollefson, 1997). Until 1967 California community colleges were an integral part of K-14 school districts (Murphy, 2004, p. 10). When state legislation was passed to create separate community college districts, many features of the K-12 structure were retained, but the overall structure was changed. The features that remained the same included: local government oversight, borrowing, taxing authority, and the right to engage in collective bargaining at the local district level (Murphy, 2004). Once the overall structure changed, however, community colleges were seen as separate entities.

1978 - Passage of Proposition 13

In November 1978 voters in California voted their support for Proposition 13, a constitutional amendment that rolled back assessed values on real estate (both personal and commercial) to the assessed values of March 1976 (Tollefson, 1997). The amendment set annual local taxes at a minimum of one percent of market value, and property valuation at two percent per year, unless the property had been sold, and with the exception of new construction or property sold after the effective date (Tollefson, 1997). To help prohibit additional state taxes on real estate, Proposition 13 also required a two-thirds majority of local voters to impose any new local taxes.

In short, from an education standpoint Proposition 13 essentially did two things. First, it reduced the authority of local educational institutions to raise local revenue with the exception of bond issuances (Murphy, 2004). Second, the passage of this legislation changed the revenue stream for California community colleges.

The immediate effect of Proposition 13 on community college funding was the reduction of local property tax support by approximately fifty percent, thus reducing local tax support for community colleges (Tollefson, 1997). In fact Tollefson reported that Proposition 13 changed the funding from approximately two-thirds local support and one-third state support to one-third local and two-thirds state support. On the other hand, Murphy (2004) reported that the passage of Proposition 13 altered the equation of local property taxes to less than one-fifth of the total revenues in 1979-1980. Either way the authors agreed that the shift in funding led to increased state control over the system both

in terms of governance by the Board of Governors and the Chancellor's Office of the California Community College system.

Although Proposition 13 shifted the burden of funding from local to state government, the methods and the amount of funding per full-time equivalent students (FTES) did not change. In other words because districts relied on local funding prior to the legislation, disparate funding was common. Funding was based on local property taxes, and when Proposition 13 passed, it seemed to cement disparate funding. It was at this point it became a state inequity issue, not a local issue. Such a disparity was shown when the Chancellor's office reported that for the 2000-2001 academic year California's 72 community college districts received a total of $5.305 billion in total revenues for 1.087 million full-time students in 2000-02, an average of $4,882 per FTES (Murphy, 2004). Individual districts varied considerably from this level. The Rancho Santiago District received $4,318 per FTES, while the West Kern District received $8,305 in total revenue per FTES (Murphy, 2004). While funding disparities were not in and of themselves problematic, they raised equity questions about whether the funds were distributed in an equitable manner.

Also, because of Proposition 13 and because of the change of funding levels, the way that California community colleges conducted business changed. Until that time, this system of higher education provided a wide variety of programs to the communities they served. While the mission of the college system did not change on passage of Proposition 13 and subsequent constitutional amendments and state legislation, the implementation did (Tollefson, 1997). For instance, after the passage of Proposition 13, community

colleges no longer offered classes that were for pure enjoyment, commonly known as community education classes. These classes were reclassified from no/low tuition to classes that needed to be self-supporting and not supported by the state's funding system.

Krouk (2004) discussed Proposition 13 and the impact of the property tax reform. This study looked at the legislation and its impact on local municipalities, which Krouk contended now favored "big box" stores rather than industries because a portion of sales tax was used in city government. In short, Krouk posited that local government saw more potential for an increased tax base from sales tax than from property tax because of the limitations of Proposition 13. The author examined qualitative data, such as the benefits to California cities securing retail outlets rather than industry, reviewed data for the Sacramento area, and compared various revenue sources for the city. The article also examined and described the tax base sharing for the Twin Cities in Minnesota. The most important finding of this article was that it explained, in detail, the implications of reassessments, property transfers, and major improvements as they related to Proposition 13. Krouk affirmed that while Proposition 13 halted increasing property taxes, it also began to erode the tax base. Local governments were restructured in an effort to maintain required funding levels.

Cothran (1986) explained that sources of "budget uncontrollability" created more competition within the system. To substantiate his position, his study examined formula funding or "uncontrollable" funding. By examining government funding and by comparing appropriation and statutory formulas, he argued that automatic funding did not have a significant impact on the growth of community colleges. In short, it was not until

the passage of Proposition 13 that there was a fiscal incentive for colleges actively to seek additional students. Of special significance was the pattern begun when policymakers improved access to higher education. Initially, automatic funding was used because the program was straightforward. In addition, strong fiscal incentives were built into the financing scheme, and agencies worked harder to enroll more students. Cothran concluded that different budgetary methods should be used depending on the value that was more important to the policy makers. The legislation could either control agency behavior by appropriate "budget uncontrollability" or control agency expenditures through such sources as appropriation or statutory formulas.

1988 – The year of Proposition 98 and Program-Based Funding

In 1988 two significant changes occurred in the funding structure of California community colleges. First, Proposition 98 changed the way all community colleges were funded by the state. Second, AB1725 was enacted and this legislation changed the way that individual community colleges were funded by the state. AB1725 introduced a number of concepts including, however, the finance component included funding colleges based on six program categories: instruction, instrucational services, student services maintenance and operations, non-credit and instructional support. In other words, Proposition 98 changed the way that the state system received funding, and AB1725 changed how individual colleges received funds.

After Proposition 13 and Proposition 4, education advocates watched for ten years as California's spending per pupil for education drastically fell behind that of other states. In 1988 California voters approved Proposition 98, an initiative that amended the state's

constitution to guarantee a minimum level of funding for K-14 education based on overall state revenue levels (Murphy, 2004). This proposition set a minimum percentage share of state general funds to K-14 at the 1985-86 level (approximately 40%) (Tollefson, 1997).

In addition Proposition 98 contained an escape clause that allowed the state legislature to suspend the minimum share in low-revenue years. Because the split was not identified in the legislation, there was continuing competition between the two sectors (Tollefson, 1997). In 1990 there was an amendment to Proposition 98 with the passage of Proposition 111. This amendment applied three calculations to determine the minimum level of funding budgeted for education for the following year (Murphy, 2004).

Under Proposition 98, three tests determined the funding level for K-14 education in relation to the state budget. When the constitutional amendment sought financial stability for education, it recognized that state revenues fluctuated. Table 2 below explains each of the three tests, but it is important to note that during times of growing state tax revenue, the first test usually applied. During times of state economic downturns, Test 2 or Test 3 applied. Last, it is important to mention that under extreme conditions the state can suspend Proposition 98 altogether, but the state must make up the shortfall in subsequent years (Murphy, 2004).

Table 2

Proposition 98—Three Tests

Test 1	Total K-14 funding will be at least 34.56 % of the state budget.
Test 2	Total K-14 funding will be at least its prior year amount, adjusted for changes in enrollment and increased by the same percentage as per capita personal income grew in the state.
Test 3	Total K-14 funding will be at least its prior year amount, adjusted for changes in enrollment and increased by the same percentage as per capita state revenues changed, plus .5 percent. If state funding is reduced, the cuts to education can be no greater than the cuts to other state programs.

The way funding was guaranteed from the state to K-14 was only the first part of the challenge. The second part came from trying to calculate the total size of the Proposition 98 pool and determining the share allocated to K-12 and the share allocated to community colleges and other educational service agencies. In 1989 the legislature enacted legislation that simplified the process and established 1989-1990 as the base year allowing each entity to calculate its potential share of the funding. Should the amount exceed the total funds available, each entity received a prorated share. The system seemed to work until 1992-93 when the legislature voted to suspend the statute guaranteeing community colleges a minimum share of Proposition 98 funds. So, for several subsequent years K-12 received its full share of funding, while community colleges declined in their portion of Proposition 98 funding (Murphy, 2004). Due to the

legislature lifting the Proposition 98 guarantee for California community colleges, it pitted the K-12 system against community colleges in a zero-sum competition over the funds, the largest source of revenues for both systems (Murphy, 2004).

Another critical piece of legislation in 1988 was AB1725. Not only did this legislation include language regarding shared governance, full-time/part-time instructor rations, remedial limits, staff development, minimum qualifications, hiring criteria, evaluation of employees, accountability, and management information systems, but the legislation also created Program-Based Funding (PBF) (Murphy, 2004). A simple explanation of this measure could not easily be done without explaining much of the detail of the allocation process. This procedure created the disparate effect of funding for California Community Colleges, which is being studied for this project.

Before discussing the details of Program-Based Funding, it is important to understand its underlying principle: Title 5 of the California Code of Regulations. This code provided the standards for various program categories. For example, standards for instruction in credit courses included such standards as a 25:1 student/faculty ratios for instruction. Another benchmark was to provide average faculty salaries equal to those in the California State University system.

The overall process of Program-Based Funding was founded on prior year base revenues that served as a starting point in calculating the district's resource needs for the upcoming year (Murphy, 2004). Then adjustments were made to the base to take into consideration increases in the cost of providing the current level of services at a rate based on inflation. From there, the target allocation was adjusted for differences in

property tax revenues to arrive at the amount the state would provide each district. As Murphy (2004) stated, "In theory, it is a sensible, nearly textbook approach to the distribution of resources" (p. 34). The process that actually happened, however, was a three-step progression.

First, PBF calculated the funding base by dividing the work of community colleges into six program categories: instruction, instructional services, student services, maintenance and operations, non-credit instruction, and instructional support. Each area had a corresponding workload measurement from FTES for instruction to amount of square foot owned or leased for maintenance and operations.

During this step the funding mechanism also made adjustments for economies of scale, which recognized that different sized districts and colleges had different overhead costs. The underlying principle was that the fixed costs associated with running a small college were higher than those of a large college when the cost was spread over the enrollment numbers. In other words fixed costs are more per full-time equivalent student for a small college because these same costs were not spread over as many people as they would be in a larger college. Small districts were those having fewer than 10,000 FTES and small colleges were those with fewer than 5,000 FTES. As with the standards the multipliers to adjust for economies of scale were part of the California Code of Regulations (Murphy, 2004).

Second, PBF made adjustments in the base to account for increases in the cost of providing current services and, if appropriate, for expansion of services. A single state Cost of Living Adjustment (COLA) was applied. Also, this calculation included a growth

factor. This factor was calculated annually by the California Community College Chancellor's Office and based on the overall adult population in the district, the number of high school graduates, the size of the underserved population, and the capacity of facilities. The funds set aside for growth were an allocation, not an estimate. Districts that exceeded their growth cap were not guaranteed funding to cover those unfunded FTES. In addition these same unfunded students did not become part of the base for the following year.

Third, the target allocation was adjusted for differences in property tax revenues to arrive at the amount that the state would contribute to each district. The formula first netted local property taxes and student fees. It was thought that by first subtracting property taxes from a district's target allocation this level of apportionment would have a leveling effect on per-student revenues across districts (Murphy, 2004).

The allocation process was intended to supply funding that accomplished the Title V standards as set forth above. The reality of funding for California's community colleges, however, was that the state never provided sufficient funds to reach these standards. Since the Program's inception in 1988, slightly more than 50 % of the amount deemed necessary was funded according to state standards (Murphy, 2004). This funding shortfall did not, however, affect all districts equally. Because the allocation process was based on the prior year's apportionment, not all districts received the statewide percentage of standard. Because these differences in funding existed when PBF commenced, some of the differences continued.

In addition the principle, which served as the standards expressed in Title 5 of the

California Code of Regulations, was difficult to establish because the state did not fully fund the standard rates. In other words based on these facts the student/faculty ratio of 25:1, as set forth in Title 5, would become 46:1 if only 54.2% of the funds needed were funded.

Because the PBF standards were never fully funded and districts were unrestricted in how they used the state allocation of funds, Murphy (2004) declared it was "difficult to understand why the state spends so much time in maintaining the fiction of the standard rate" (p. 42). In 2001-2002 community colleges would have received approximately $3 billion more in state revenue if the standard rates had been applied.

Looking at PBF, it was important to note there was not much incentive for a district to expand high-cost programs since every credit FTES was reimbursed the same to an individual district. There often was a disincentive for districts to expand some of the high-cost programs, which included, but were not limited to, nursing, technical vocational programs, and natural sciences. In other words, it was more lucrative for districts to expand credit instruction that cost less to deliver. In addition, under the PBF model, a single statewide Cost of Living Adjustment (COLA) was applied to the base, and a district's target allocation was created.

General Apportionment

General apportionment was derived from three sources: the state, local property taxes, and student fees. To determine the state's contribution, the PBF formula first deducted student fees and local property taxes. The differential between what the district

should have been allocated under PBF and what was actually obtained through student fees and property taxes, equaled the state's contribution.

It was true that there were wide disparities in resources available to districts. In geographic areas where there was high property tax income, it was possible for a district to receive more money in property taxes than in its allocation; three districts in the state, Marin, Mira Costa and South Orange, fell into this category in 2000-2001 (Murphy, 51). These areas were designated as Basic Aid Districts.

Equalization Funding

Even given the differences in funding for California Community Colleges, the state was still the largest contributor to community college funding (Carroll, 2006). The range of the funding discrepancy was not small, as noted above; it spanned thousands of dollars per full-time equivalent student.

In the early 2000s, a budget plan was created to address the disparity of funding for California community colleges. This plan called for increased funding for the under-funded community colleges, to bring all districts to the 90^{th} percentile of average state funding for community colleges. The plan called for a special appropriation of $240 million distributed over three years (Carroll, 2006).

Community colleges used the funds differently. Most put this new revenue to good use, from expanding programs and classes for their communities, to hiring more full-time faculty, to making many other sorely needed improvements (Carroll, 2006). For example, the additional funds allowed the lower-revenue community colleges to restore hundreds of classes and to offer a new "semester, known as intercession, which takes place during the winter break between the traditional fall and spring semesters" (Carroll,

2006). In 2005, the community college system's Board of Governors asked for a second installment of equalization funding totaling $80 million. The final amount approved, however, was only $30 million.

These equalization challenges continued for California's community colleges. They recognized that the funding differences among community college districts, differences, in some cases, of thousands of dollars per student, bore no relationship to true underlying costs and that these disparities created efforts to equalize funding among districts. In general, it was argued that equalization could foster increased fairness and ensure that students in different parts of the state had access to similar levels of educational support and quality of services.

Funding in Association with Student Success and Student Retention

I was unable to find studies as they related to disparate funding of community colleges and the association with student success and retention. In addition, because this study focused on equalization funding, I searched for peer-reviewed articles regarding these concepts. I was unable to find any on point. I did, however, find a couple of articles that discussed related research. Although these studies examined K-12 institutions, because in California similar funding structures are in place, similar conclusions about the one might apply to conclusions about the other.

On a national level, Harknet et al. (2003) reviewed education costs to children. This study found that the government spent approximately $6,000 per child each year on education, social programs, and tax exemptions for parents. Two-thirds of this amount was determined at the state and local level, suggesting that expenditures on children

varied widely across the 50 states. This study was undertaken to understand how variations in state expenditures affected child outcomes, which is particularly important in the current policy and fiscal context.

Sheldon (2003) stated that although there have been times of state financial crisis, community colleges remain committed to open access, and, although financial limitations do not cause colleges to change admission standards or enrollment requirements, shortfalls reduce the access to students in other ways. These shortfalls instead limit course offerings and thereby reduce the availability of courses and create greater pressure on students to compete for educational opportunities during times of scarcity. In addition, Sheldon believed that community colleges' historic mission is to expand access to nontraditional, first-generation, and underprepared students. As such, many of these students have greater need for services that support retention and academic success. Yet many community college systems already have inadequate funding for these programs. When funding is reduced, these already inadequately funded projects become greater concerns.

Sheldon (2003) reported that when California experienced fiscal crises in the early 1990s, access was reduced, and the transfer mission of community colleges was threatened. Her study found that there was a direct effect on the number of transfer students to both the University of California (UC) and the California State University (CSU) systems. The reduced number of students attending community college is directly attributable to the number of transfer students at these institutions.

Harknet et al.'s (2003) research examined the relationship between public expenditures on children and child outcomes. The research showed that public expenditures on children are related to better child outcomes—across several indicators including elementary-school test scores, measures of child mortality, and adolescent behavioral outcomes. Approximately half the indicators studied were significantly related to public investment. Harknet et al. stated, "Our results show that education expenditures have particularly strong and positive effects on child outcomes, especially test scores and adolescent behavior" (p. 17).

In a similar study, which looked solely at K-12 California schools and grew out of the *Serrano v. Priest* decision, Sebold and Dato (1981) found that the effects of equalization funding were not exactly awe-inspiring, but there was a significance on student performance—especially in terms of the math performance on standardized testing. The authors stated, however, "that that there is some support for the hypothesis that expenditures and cognitive development are directly related" (p. 103). And in conclusion, although fairly small, this study showed that there is a direct implication that equalization expenditures per student has an impact on standardized test scores for the primary and secondary systems in California.

CHAPTER 3: METHODOLOGY

Because of the disparate funding system on a per FTES allocation, it was impossible for some of California's community colleges to achieve the same funding levels as other colleges in the system. This struggle to receive equal funding per full-time equivalent student has been ongoing for many years. In the attempt to create an equal funding structure, the state legislature enacted equalization funding for the 2004-2005 academic year to bring more funding equity into the California Community College system. This retrospective dissertation looked at these disparate funding levels by identifying which schools received equalization funding and which were not eligible for equalization funding. From there, trends in student course success and student course retention were evaluated.

Because there were a number of factors that lead to student success and student course retention, my findings are only suggestive as to the impact of additional funding on each of the colleges receiving equalization funding. For this reason, I have used descriptive statistics to interpret the data.

Research Design and Rationale

This study used archival data as collected from the California Community College Chancellor's Office. Taking a positivist approach, this study reported variability, based on the total population. This quantitative study used California community colleges and examined the possibility of relationship linkages of equalization funding, as it identified trends and variability of such matters as course success rates and course retention rates. In addition, it compared these same factors as the funding mechanism changed from

disparate funding with an added equalization funding mechanism to that of equivalent FTES funding.

Research Questions

In this study, 107 California community colleges were analyzed. Five other colleges/centers did not have complete data for the period studied. Three of those were Folsom Lake, San Francisco Centers, and West Hills – Lemoore. All of these institutions were opened during the six-year study period, so there was not complete data. The other two colleges of Solano and Marin did not have complete data for both success and retention for the six years of the study even though they have been in existence for the years studied.

I used data from those colleges which did not receive equalization funding (labeled non-funded colleges for this study) and colleges which received equalization funding (labeled funded colleges for this study). The years reviewed were: Year 1 (2002-03); Year 2 (2003-04); Year 3 (2004-05); Year 4 (2005-2006); Year 5 (2006-07); Year 6 (2007-08). First year of equalization funding was 2004-2005, or Year 3 of the study. Only the Fall and Spring terms were analyzed for each of the years. No summer sessions or intercessions were included in the data calculations.

For the purposes of this dissertation, a college was treated as a funded college if it was eligible for funding for the first year of the equalization program (2004-2005). Conversely, a college was treated as non-funded if the college was not eligible for funding for the first year of the program.

As stated in Chapter 1, the following were the research questions addressed:

- College Student Course Success
    - By looking at the empirical growth plots for each college, how did the success scores of each college change over time?
    - After dividing the total population of all colleges into two groups (non-funded and funded), and superimposing fitted trajectories on to each of the college's empirical growth plots, what were the slopes and R^2 ranges for the success graphs of each college? How did the two sub-populations (non-funded and funded) compare to the overall average?
    - What was the frequency of success slopes for both subgroups (non-funded and funded)? How did the individual plots compare to the overall sub-populations for student course success? What were the success means, maximums, and minimums for each of the sub-populations, and how did they compare to the other sub-populations?
    - After further dividing the two sub-populations (non-funded and funded) into four sub-populations (multi-campus and single-campus district colleges), what was the frequency of success slopes for all four of the subgroups? How did the individual plots compare to the overall sub-populations for student course success?

What were the success means, maximums, and minimums for each of the sub-populations, and how did they compare to the other sub-populations?

- College Student Course Retention
  - By looking at the empirical growth plots for each college, how have colleges' course retention scores changed over time?
  - After dividing the overall population of all colleges into two groups (non-funded and funded), and superimposing fitted trajectories on to colleges empirical growth plots, what were the slopes and R^2 ranges for each of the colleges retention graphs? How did the two sub-populations (non-funded and funded) compare to the overall retention average?
  - What was the frequency of retention slopes for both subgroups (non-funded and funded)? How did the individual plots compare to the overall sub-populations for student course success?
  - What were the retention means, maximums, and minimums for each of the sub-populations, and how did they compare to the other sub-population? After dividing the two populations into four populations (multi-campus and single-campus district colleges), what was the frequency of course retention slopes for all four subgroups? How did the individual plots compare to the overall sub-populations for student course retention? What were the

success means, maximums, and minimums for each of the sub-populations, and how do they compare to the other sub-populations? When comparing each individual college's student course success line and student course retention line, which colleges had similarly shaped lines? In multi-campus districts, were there any similarities between the colleges in the district?

Limitations and Assumptions

As with any project, this research had some limitations. First, I used data collected from the California Community College Chancellor's Office. At each of the California Community Colleges, data were collected and then transferred to the Management Information System Office of the California Community College Chancellor's Office. Because of the complexity of the data and the need to be able to audit individual districts, the Management Information System office was specific and prescriptive regarding the information requested by each individual college, and individual district funding from the State is dependent on appropriate data collection. After data were reported to the state by each individual college/district, they were reviewed for inconsistencies by the Management Information System. If any inconsistencies were found, the State sent the data back to the district for editing, and the college then researched and repaired the data. To avoid having to do such work, each college paid special attention to gathering appropriate information for reporting purposes. In addition it is important to note that these data are part of each college's annual audit.

All the data from the Chancellor's office are collected on a term-by-term basis, and then combined to create academic year data. In turn this information was used for comparison and budgeting purposes. The Chancellor's office also used this for reporting to federal agencies, such as the Integrated Postsecondary Education Data System (IPEDS) report. The Chancellor's Office then made the data available for the general population on the Data Mart website hosted by the Chancellor's office.

While each college gathered information through different enterprise reporting programs, the final data reported to the state had to fit very specific parameters. According to Patrick Perry, California's Vice Chancellor of Technology, Research, and Information Systems, the state had been trying for 15 years to amass data reliable enough to be used for comparison purposes (Personal communication, May 2, 2006). Perry reported that it was only since the early 2000s that the data were deemed sufficiently reliable for that purpose. Other than the information provided by the Chancellor's Office, no other information is available regarding the reliability of the data. In addition no information was available on why specific data are collected by the Chancellor's Office, except that legislation was once put in place to determine specific information on which to base funding

The entire population of California Community Colleges was used. As such there was not an instrument used in this retrospective study of archival data nor was there any measurement reliability or measurement validity. Also, because the entire population was used, there was not any ability to generalize the findings or any appropriate external validity measures.

Participants

This study was conducted using archival data from all California community colleges, and the data were obtained from the state Chancellor's office. The population was California Community Colleges, and therefore, there was no identified sample.

Instrumentation

Since the study utilized archival data, no instrument was used. There was therefore not any measurement reliability or measurement validity. Also, because the entire population was used, it was not possible to generalize the findings or any appropriate external validity measures.

Data Collection

The data were obtained from the Chancellor's Office of the California Community College system. The same table was used as that which creates reports; it can be found at http://www.cccco.edu/SystemOffice/Divisions/TechResearchInfo/MIS /DataMartandReports/tabid/282/Default.aspx. I used various subsets of data, including but not limited to data under Program Retention/Success Rates. From that choice on the Data Mart site, I then used the statewide screen. Data from each term of each academic year were obtained for each of the colleges, and it was determined if the college received equalization funding.

For purposes of determining the districts/colleges that received equalization funding, the list of districts was provided by the Fiscal Policies Office of the Chancellor's Office. Each college was coded as either receiving equalization funding or not receiving

equalization funding. In addition, each college received coding as to which district they belonged and whether it is a multi-campus or single-campus district.

Data Analysis

Because there are a number of factors that could lead to student success and student retention, the findings in this dissertation have only suggested the impact of additional funding on each of the colleges/districts that received equalization funding. The research used the tools of descriptive statistics, such as percentages, means, standard deviations, frequency distributions, central tendency, and variability. In addition, the data were described using trends of success rates and student retention and interpreting the trends with the understanding that other factors could be responsible for observed differences.

Methodology

My interest, my perspective, and the archival data that I used for my study, lent themselves to a quantitative method type of study. When evaluating the various types of quantitative studies, Gliner and Morgan (2000) review the five basic approaches to research and their purposes. The authors divided research into three types: experimental, individual differences, and descriptive. In experimental research, there was an active independent variable. The term "experimental research" refers to both randomized experimental research, which determines causes, and quasi-experimental research, which examines causality. In individual differences research there was an attribute independent variable. There were two types of individual differences research: comparative and associational. Comparative research compares groups, while associational research finds

associations, relates variables, and/or makes predictions. Lastly, in descriptive research, there was no independent variable; the research simply summarizes the data. Because of the type of data available and the characteristics I intended to study, I chose a descriptive study. In addition, because I used my data to compare two groups—colleges and districts that receive equalization funding with those which do not— the study lent itself very well to a between-subject design.

Summary

Although disparate funding at each of the California community colleges in the form of FTES allocation has a long history, times have changed. In this dissertation I have briefly reviewed key events and concepts within the history of community college financing, and more specifically within the state of California. I have discussed key concepts such as inter-district equity and defined key terms employed by the California Community College System.

Funding mechanisms for community colleges in California have changed. In 2006-07, the State allocated the same dollar amount per FTES for every community college in the State, but for different base amounts depending on the size of college and other factors such as number of campuses, centers, and other variables. Without thoroughly reviewing past attempts at equalization, it was difficult to evaluate any new funding mechanisms.

In this study, I review California Community Colleges, their funding levels, student success, and student retention for the period of July 1, 2002, to June 30, 2008.

This was a descriptive quantitative study using archival data from all California community colleges, and the data were obtained from the State Chancellor's Office.

While there was significant literature available in the area of community college finance, only limited research has been done on the impact that disparate funding structures have on student course success and student course retention.Therefore this research is warranted and my study may have several potential publication possibilities. In addition to such journals as the *Journal of Community Colleges*, I believe it also has potential in publications produced by the Association of California College Business Officers or other such business publications.

CHAPTER 4: FINDINGS

Four areas serve as a review before delivering the study's findings. First, this study looked at 107 California community colleges (or centers). Five colleges/centers were not used because of incomplete data. Second, the years reviewed were: Year 1 (2002-03); Year 2 (2003-04); Year 3 (2004-05); Year 4 (2005-2006); Year 5 (2006-07); Year 6 (2007-08). In each of these years only the Fall and Spring term data were used. No summer terms or intercessions were included in the data calculations. Third, the first year of the Equalization Funding was 2004-2005 (Year 3 of this study). For purposes of this dissertation, a college/center was treated as a funded college (a college receiving equalization funding) if it was eligible for funding for the first year of the program. Conversely, a college was treated as a non-funded college (a college not receiving additional equalization funding) if it was not eligible for funding for the first year of the program. Fourth, a college was coded as either a single-campus district college or a mult-campus district college. If a college originally started as a single campus district college but had another college approved by the Chancellor's office so as to become part of a multi-campus district during the time of the study, the college was coded as a multi-campus district.

Overview of This Study

In this research I looked at change-over-time success rates and course retention rates of colleges in several ways. First, I described each of the individual college's success rates by looking at the smoothing of the empirical growth plots and then categorizing them by the shape of their growth plots. Second, the total population was

divided into colleges that received equalization funding and those colleges that did not receive equalization funding. These two subgroups had slope and R^2 ranges evaluated, and, in an effort to see the individual slopes in a graphical reference, each of the college success rate was used to fit trajectories on superimposed empirical growth plots. Third, two histograms were created to show the frequency of slopes for both of the subgroups—non-funded and funded colleges. Then, two plots were completed to show the 27 non-funded colleges and the 80 funded colleges. These same data provided the basis for descriptive statistics regarding means, maximums, and minimums.

The last part of the success section looked at four subgroups by futher subdividing the non-funded and funded colleges into being part of either a multi-campus or single-campus district. This section evaluated average slopes for these four subgroups, as well as frequency of slopes and means.

After the course success rate data were evaluated, course retention rates for each college was evaluated in the same manner as the success rates. Change-over-time retention rates were evaluated with the smoothing of empirical growth plots, shape, slope, and fitted trajectories. In addition plots and tables were completed to present descriptive statistics regarding means, maximums, and minimums.

As with the success rates the last part of this retention section looked at four subgroups by dividing them into non-funded and funded colleges and multi-campus or single-campus district colleges. From these four subgroups, average slopes, frequency of slopes, and means of the four groups were evaluated.

The last part of this chapter evaluated each of the college's success and retention graph against each other. In addition these graphs were segmented into their respective community college district and showed change-over-time for both success and retention for each of the colleges studied. By looking for similarities between success and retention for the six years of the study, this study evaluated patterns within the district and the college.

Student Course Success Rates

As this study identified several findings about student course success rates and their association with equalization funding, it is important to note that several views were used to gain an accurate understanding of the relationship. While one set of findings appeared at first review, through several iterations of data other findings became apparent.

Comparison of Total Population

First, the empirical growth plots were smoothed for course success for each of the colleges. Smoothing required no assumptions; rather it let the data speak for themselves and provided numeric summaries for each data set. For this part of the analysis the entire population was reviewed and categorized. There was not a separation of non-funded and funded colleges. This allowed an overall picture of what occurred in the State's community college course success over the six-year period. Also, this process allowed each college's graph to be evaluated for elevation, shape, and tilt. Appendix A shows the graphs for each college.

This process found that 31 colleges had fairly straight lines meaning there was little change-over-time for success rates. These colleges were: Alameda, Allan Hancock, Bakersfield, Cabrillo, Crafton Hills, Cuyamaca, Cypress, Diablo Valley, El Camino, Fullerton, Golden West, Grossmont, Lake Tahoe, Laney, Mendocino, Mission, Modesto, Moorpark, Mt San Antonio, Mt. San Jacinto, Orange Coast, Pasadena, Porterville, San Diego City, San Diego Mesa, San Francisco, Sierra, Southwestern, Taft, West Hills Coalinga, and Yuba. Other colleges had seemingly flat success rates, but then had some variations. For instance, four colleges had a drop in success early in the study and then success rates flattened. These colleges were Compton, Los Angeles City, Siskiyous, and Skyline. Conversely, four colleges had flat levels of success and then a drop or decline: American River, Sacramento City, Saddleback, and San Joaquin Delta.

Twelve colleges had a "u-shaped" graph, meaning the success rates where higher at the beginning and end of the study period with lower success rates during the middle years of the study. Of those, five had a small "u-shape": DeAnza, Foothill, Fresno City, Hartnell, and San Bernadino. Gavilan had a small "u shape," and then success rates became flattened. Conversely, Lassen and Santa Monica had success rates that were flat and then "u-shaped." Four colleges that had a "reverse-u" shape in their success plots—or lower success rates at the beginning and end of the study, with higher levels during the middle years of the study. Butte had a "reverse-u," while Santa Rosa had flat rates and then a small "reverse-u" in the later years of the study, while Chabot Hayward and Barstow had a small "reverse-u" and then success rates which flattened out later in the study.

There were eight colleges that showed steady decreases or increases in their success charts over time. First, Glendale and Irvine both showed small declines over the time of the study, while Ohlone and Mira Costa initially showed a rise in success early in the study and then a small decline over time. Three colleges that first had relatively flat success rates, and then had rises were: Merced, Santiago Canyon, and Rio Hondo. Similarly, Imperial had a flat success rate, then a drop, and then a steady rise, while West Valley showed a small increase for the years of the study.

Of the 107 colleges reviewed 14 colleges had flat or increasing success lines, followed by drops in success, and finally flat lines. These colleges included East Los Angeles., Sequoias, Shasta, Feather River, Los Angeles Pierce, Los Angeles Southwest, Los Angeles Valley, Long Beach, Napa, West Los Angeles, Los Angeles Harbor, Los Angeles ITV, Los Angeles Mission, and Los Angeles Trade. It was noted that many of the Los Angeles colleges had this pattern. There were six additional colleges that had flat success lines, followed by a small drop at the end of the study. These colleges included: Berkeley City, Cerritos, Columbia, Copper Mountain, Cuesta, and Las Positas.

Ten colleges had an "s-pattern" in success rates meaning at the beginning of the study success rates were higher and then lowered, then raised, and then lowered like a letter "s" on its side. Desert had the largest "s- shape," with College of the Canyons and Cerro Coso also showing an "s-shaped" success curves. In addition, seven colleges had smaller "s-shaped" curves: Antelope Valley, Canada, Contra Costa, Los Medanos, Redwoods, Riverside, and San Jose City.

Of all the colleges studied, 14 (13%) had success plots other than the shapes categorized above. These colleges included: Chaffey, Citrus, Coastline, Cosumnes River, Evergreen Valley, Merritt, Oxnard, Palomar, Reedley, San Diego Miramar, San Mateo, Santa Barbara, Ventura, and Victor Valley.

Comparison of Sub-Populations

To compare subgroups the total population was next divided into colleges that received equalization funding for the first year of the program (Year 3 of the study, or the 2004-2005 academic year) and those colleges that did not receive equalization funding. The N for colleges that did not receive equalization funding was 27, and N for colleges that received equalization funding was 80.

Slope Change-Over-Time by Sub-Population

Each college's funding status and slope was identified. The average slope for all colleges over the six-year time period was -0.00457. When looking only at non-funded colleges, the average slope was -0.00987, or nearly double the average of the total population. The average slope for colleges that that received equalization funding was -0.00278, nearly half of the average for the total college population (Table 3).

Table 3

College, Equalization Funding Status, and Success Slope Comparison

College	Non-Funded or Funded College	Success Slope
Alameda	Non-Funded	-0.0062
Allan Hancock	Funded	-0.0050
American River	Funded	-0.0063
Antelope Valley	Funded	-0.0086
Bakersfield	Funded	0.0001
Barstow	Non-Funded	-0.0127
Berkeley City	Non-Funded	-0.0067
Butte	Funded	-0.0056
Cabrillo	Funded	-0.0025
Canada	Funded	-0.0010
Canyons	Funded	0.0234
Cerritos	Funded	-0.0059
Cerro Coso	Funded	-0.0002
Chabot Hayward	Funded	-0.0046
Chaffey	Funded	0.0043
Citrus	Funded	0.0042
Coastline	Funded	0.0090
Columbia	Funded	-0.0086
Compton	Funded	-0.0107
Contra Costa	Funded	-0.0027
Copper Mountain	Funded	-0.0055
Cosumnes River	Funded	-0.0140
Crafton Hills	Funded	-0.0001
Cuesta	Funded	-0.0043
Cuyamaca	Funded	-0.0018
Cypress	Funded	0.0022
Deanza	Funded	-0.0003
Desert	Funded	0.0021
Diablo Valley	Funded	-0.0032
East L.A.	Non-Funded	-0.0197
El Camino	Funded	-0.0045
Evergreen Valley	Funded	-0.0015

Feather River	Non-Funded	0.0027
Foothill	Funded	-0.0052
Fresno City	Funded	-0.0036
Fullerton	Funded	-0.0032
Gavilan	Funded	0.0021
Glendale	Funded	-0.0035
Golden West	Funded	0.0017
Grossmont	Funded	-0.0001
Hartnell	Funded	-0.0041
Imperial	Funded	-0.0068
Irvine	Non-Funded	-0.0051
Los Angeles City	Non-Funded	-0.0248
Los Angeles Harbor	Non-Funded	-0.0159
Los Angeles ITV	Non-Funded	-0.0102
Los Angeles Mission	Non-Funded	-0.0237
Los Angeles Pierce	Non-Funded	-0.0208
Los Angeles S'west	Non-Funded	-0.0204
Los Angeles Trade	Non-Funded	-0.0209
Los Angeles Valley	Non-Funded	-0.0246
Lake Tahoe	Non-Funded	0.0029
Laney	Non-Funded	-0.0023
Las Positas	Funded	-0.0067
Lassen	Non-Funded	-0.0182
Long Beach	Funded	-0.0189
Los Medanos	Funded	-0.0022
Mendocino	Non-Funded	-0.0006
Merced	Funded	0.0129
Merritt	Non-Funded	-0.0057
Mira Costa	Non-Funded	0.0291
Mission	Funded	0.0010
Modesto	Funded	-0.0031
Monterey	Funded	-0.0146
Moorpark	Funded	0.0027
Mt San Antonio	Funded	-0.0034
Mt. San Jacinto	Funded	-0.0015
Napa	Funded	-0.0112
Ohlone	Funded	-0.0057
Orange Coast	Funded	-0.0030
Oxnard	Funded	0.0001

Palo Verde	Non-Funded	-0.0161
Palomar	Funded	0.0075
Pasadena	Funded	-0.0077
Porterville	Funded	-0.0031
Redwoods	Funded	-0.0044
Reedley College	Funded	-0.0047
Rio Hondo	Funded	0.0011
Riverside	Funded	-0.0080
Sacramento City	Funded	-0.0032
Saddleback	Non-Funded	-0.0135
San Bernardino	Funded	0.0037
San Diego City	Funded	-0.0025
San Diego Mesa	Funded	-0.0006
San Diego Miramar	Funded	-0.0089
San Francisco	Non-Funded	-0.0036
San Joaquin Delta	Funded	-0.0154
San Jose City	Funded	-0.0060
San Mateo	Funded	-0.0037
Santa Ana	Funded	-0.0016
Santa Barbara	Funded	0.0028
Santa Monica	Funded	-0.0013
Santa Rosa	Funded	-0.0034
Santiago Canyon	Funded	0.0005
Sequoias	Funded	-0.0133
Shasta	Funded	-0.0089
Sierra	Funded	-0.0019
Siskiyous	Non-Funded	-0.0073
Skyline	Funded	-0.0043
Southwestern	Funded	-0.0022
Taft	Non-Funded	-0.0019
Ventura	Funded	-0.0082
Victor Valley	Funded	0.0010
West Hills Coalinga	Non-Funded	0.0008
West Los Angeles	Non-Funded	-0.0212
West Valley	Funded	0.0048
Yuba	Funded	-0.0031

Averages for All Colleges	**-0.0046**
Average for Non-Funded Colleges	**-0.0099**
Average for Funded Colleges	**-0.0028**

Next, in an effort to see the individual slopes in a graphical reference each of the college success rates was used to fit trajectories superimposed on empirical growth plots. This representation was done by the same two subgroups—non-funded colleges and funded colleges. To look at specifics for non-funded colleges, the R^2 ranged from a low of .0348 for Mendocino to a high of .8824 for San Francisco. The slope of the fitted trajectories ranged from a minimum of -0.2477 for Los Angeles City to .02913 for Mira Costa. The specific graphs have been shown in Appendix B. Of the 27 non-funded colleges, 20 (74%) colleges had a negative fitting trajectory, 2 (7%) had a relatively flat trajectory, and 5 (19%) had an increasing trajectory.

For the funded colleges, the R^2 ranged from .0002 for Oxnard to .9534 for Pasadena. The slope of the fitted trajectories for funded colleges ranged from -.01887 for Long Beach City College to .02336 for College of the Canyons. The graphs with fitted trajectories for equalization-funded colleges can be seen in Appendix C. Of the 80 colleges that received equalization funding, 44 (55%) had a negative fitting trajectory, 25 (31%) had a relatively flat trajectory, and 11 (14%) had an increasing trajectory.

To illustrate this point more clearly, two histograms were created to show the frequency of slopes for both of the subgroups (Figure 2). While 14 of the 27 slopes for the non-funded colleges had a negative slope, only 7 of the 80 of the funded colleges had a negative slope. Conversely, 4 of the 27 non-funded colleges had positive, and 20 of the 80 funded colleges had a positive slope. Of the colleges having flat slope, 9 of the 27 non-funded colleges were compared to 53 of the 80 funded colleges. Overall, in terms of numbers as compared to total of the sub-population, it appeared more non-funded colleges had a negative success slope than the funded colleges.

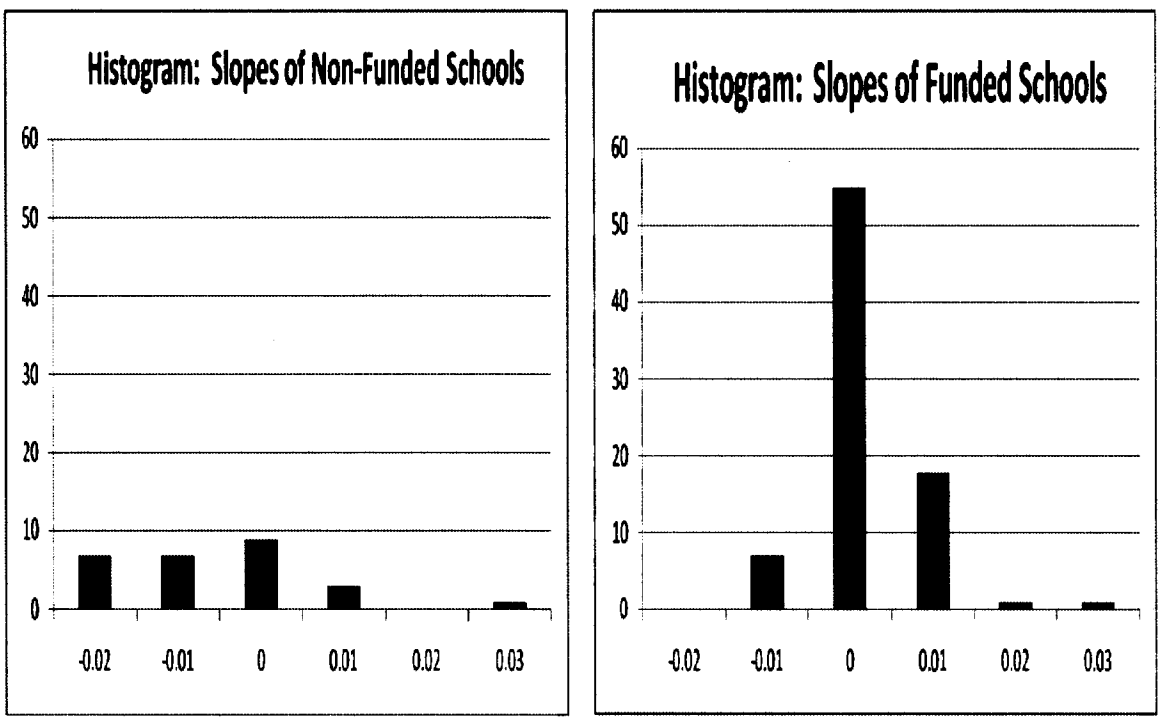

Figure 2. Histograms of funded and non-funded slopes.

In order to get a more detailed view of the distribution of success rates of the colleges in comparison to one another two plots were completed. The first showed the

success rates of the 27 non-funded colleges. In this group, the college that consistently maintained the highest success rates was Taft, with Palo Verde being the second highest outside the majority of the group (Figure 3). And while Mira Costa Community College started out with the lowest success rates in Years 1 and 2, Los Angeles ITV had the lowest course success rate in Years 3-6 of the study. Los Angeles Southwest had the second lowest success scores for Years 3-6.

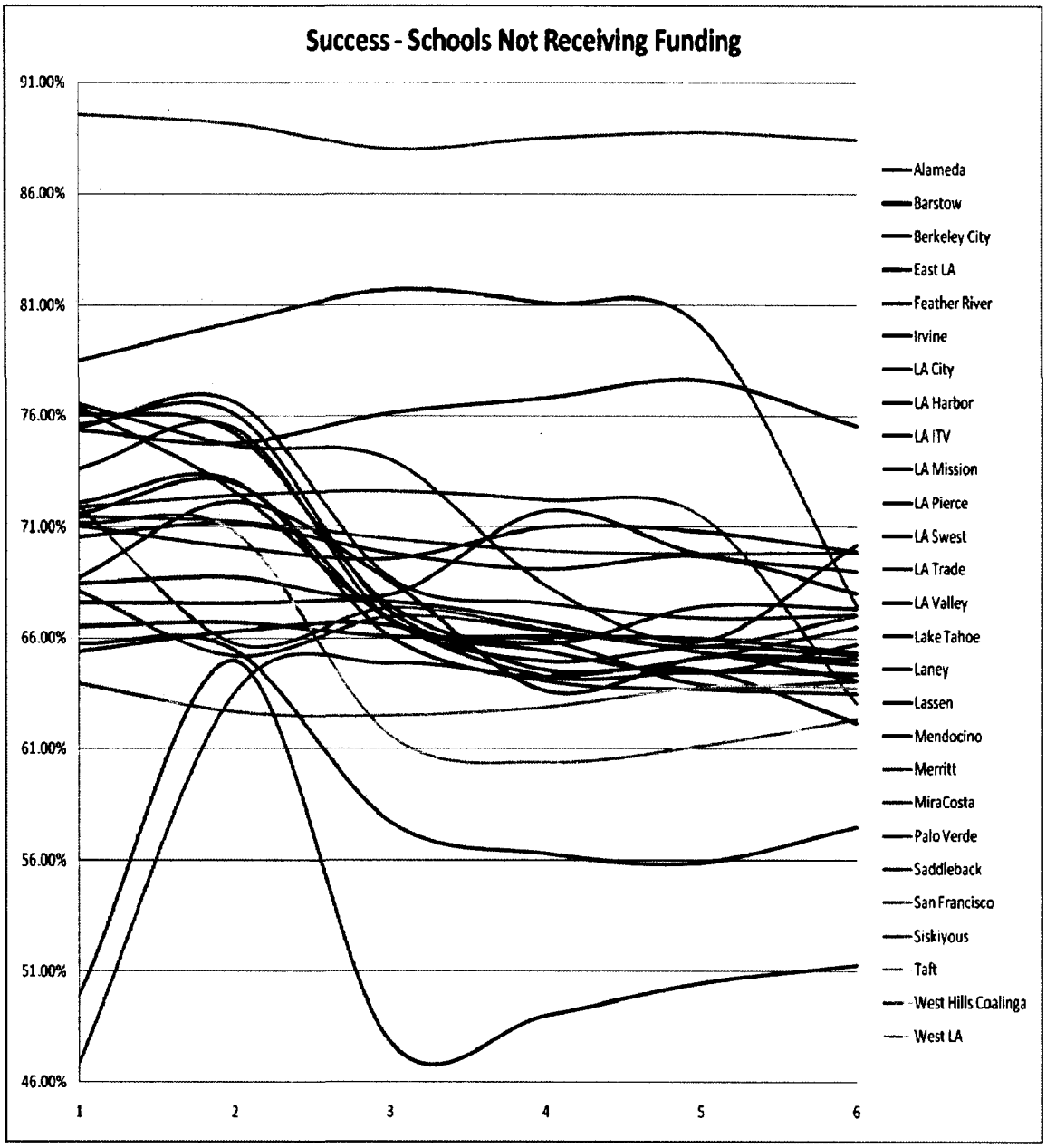

Figure 3. Success rates of colleges that did not receive equalization funding.

For funded colleges (n = 80), a similar chart was created (Figure 4). The college that maintained the highest success rates consistently was Foothill College until Year 5, when College of the Canyons came very close in success rates. Interestingly, DeAnza

College, sister college to Foothill in the multi-campus district, was steadily in the second highest position in student success until Year 5 of the study. And while Merced College started out with the lowest success rates in Year 1, the college increased student success rates over the next few years and soon became close to the other colleges success rates. Conversely, in Year 6 of the study, San Joaquin Delta College showed a dramatic decrease in success rates. To summarize, however, for most of the years studied, many of the funded colleges had similar success rates.

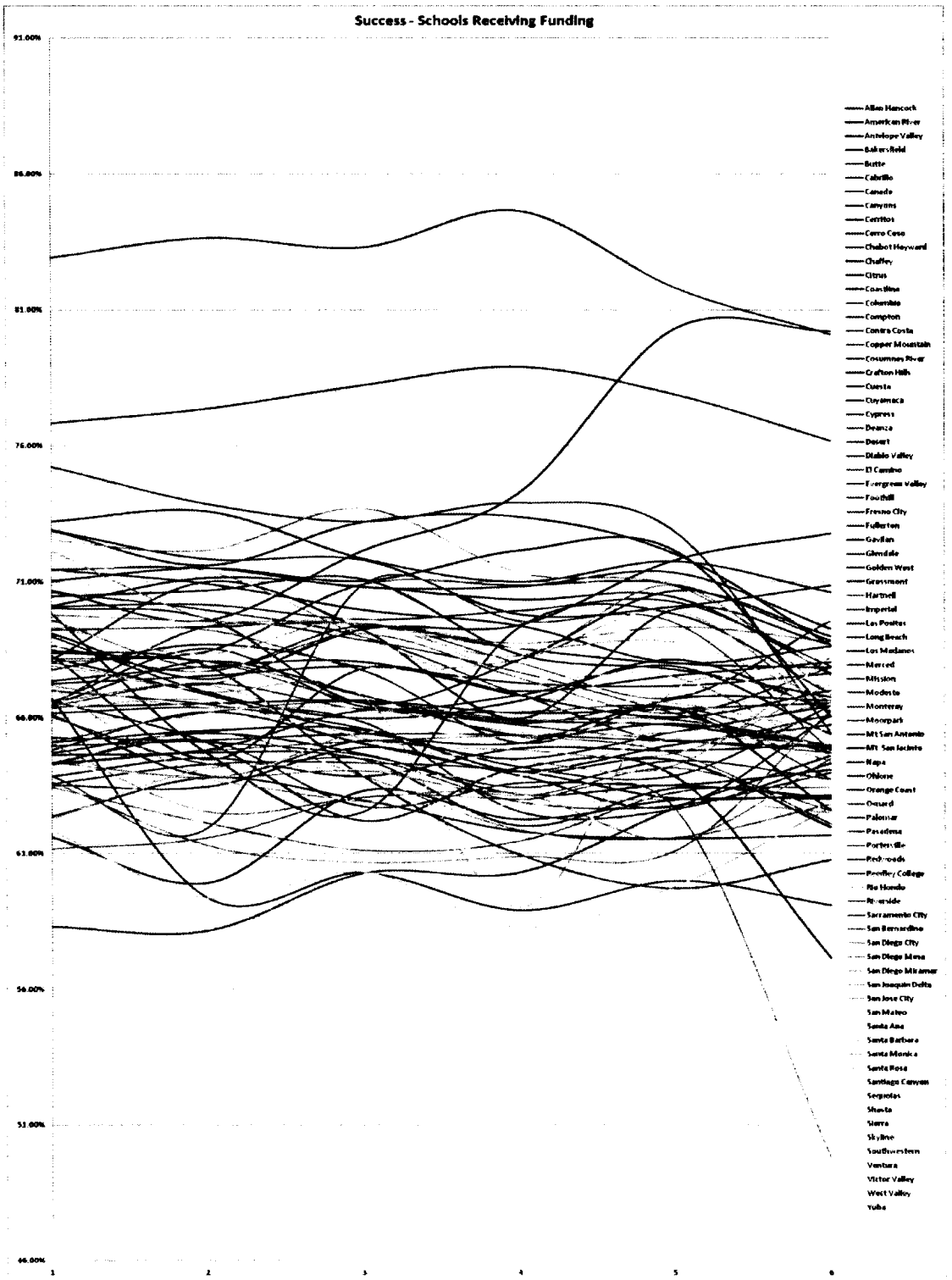

Figure 4. Success rates of funded colleges.

To further specify the differences between the two groups, the means of student success percentages were calculated (Figure 5 and Table 4).

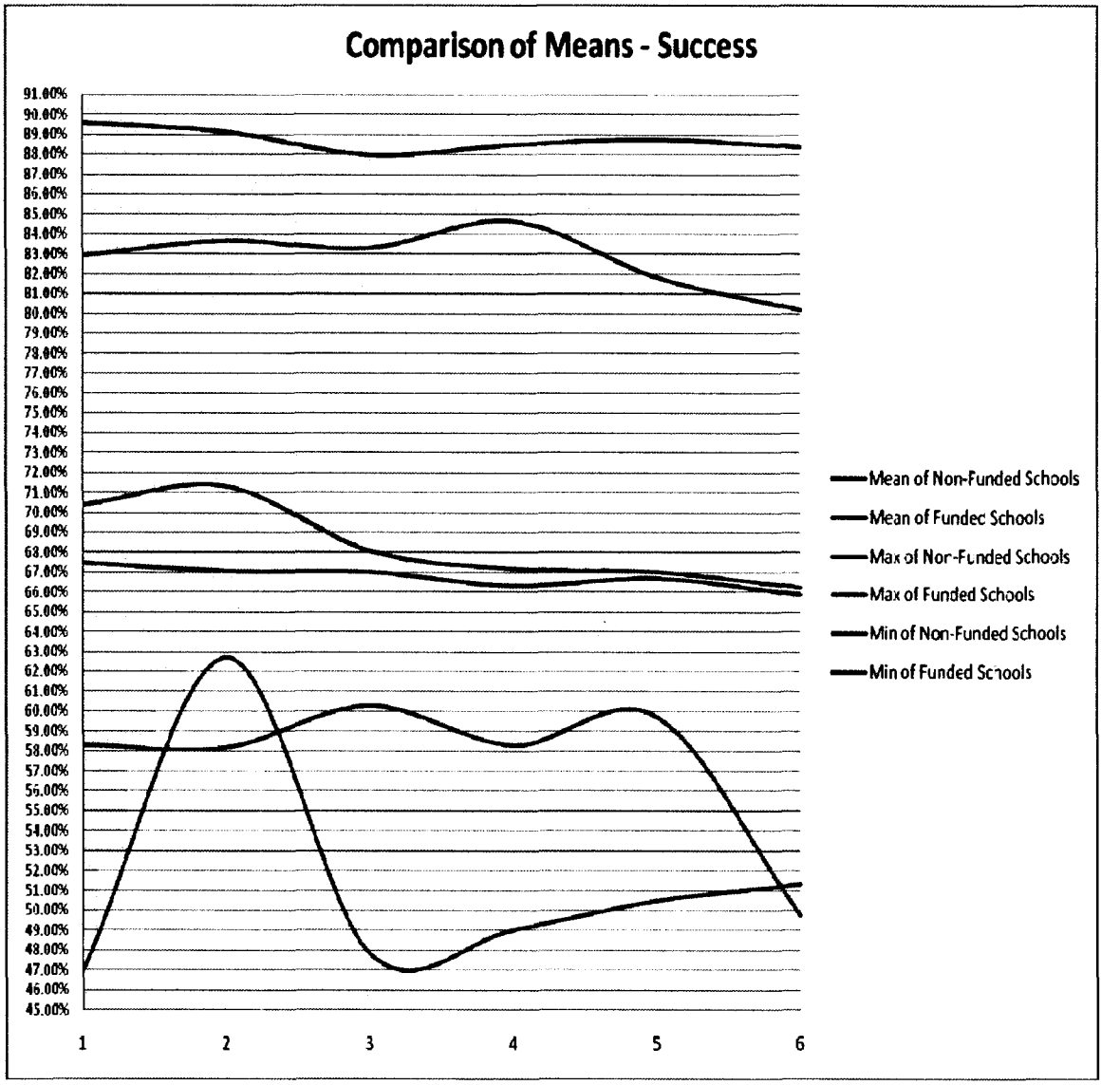

Figure 5. Success Graphs of Means, Maximums, and Minimums for Non-Funded and Funded Colleges.

The highest mean for non-funded colleges was in Year 2 (2003-2004) at a level of 70.78% and the lowest mean was in Year 6 (2007-2008) with a course success rate of

66.54%. For funded colleges, the highest level was in Year 1 (2002-03) with 67.42%. And like the non-funded population, the lowest success rate for funded colleges was also in Year 6 with a rate of 65.77%. The greatest differential between these groups was in Year 2 with a difference of 3.80%; the smallest was in Year 4, with a differential of .71%. It is interesting to note, however, that Year 1 and 2 had the greatest differential in success rates with 2.57% and 3.80%, respectively. In Year 3, that number dropped to 1.29%. In Years 4-6, those numbers have hovered less than one percentage point at .71%, .74%, and .77%.

The success rate maximum points varied, but overall there was a clear difference between non-funded colleges and funded colleges. In Year 1, the differential was 6.64% between the college with the maximum success rate for a non-funded college and a funded college. In Year 3, that difference was 4.71%, and in Year 6, the difference widened to 8.2%. For the success rate minimums, in Year 1 there was an 11.36% gap between non-funded colleges and funded colleges, with funded colleges having a higher minimum success than non-funded colleges. Although Year 2 brought a reverse, Year 3 saw funded colleges again having a higher minimum until Year 6. In short, the standard deviation of non-funded colleges remained between 8.15% and 5.74% for non-funded colleges, while the standard deviation for funded colleges was between 4.25% and 3.78%.

Table 4

Descriptive Statistics for Course Success: Two Subgroups

	N	Mean	Std. Dev.	Max	Min
Year 1 - 2002-2003					
Colleges Not Receiving Equalization Funding	27	70.39%	8.15%	89.56%	46.94%
Colleges Receiving Equalization Funding	80	67.49 %	3.78%	82.92%	58.30%
Year 2 - 2003-2004					
Colleges Not Receiving Equalization Funding	27	71.32%	5.74%	89.14%	62.68%
Colleges Receiving Equalization Funding	80	67.09%	4.00%	83.64%	58.18%
Year 3 - 2004-2005					
Colleges Not Receiving Equalization Funding	27	68.07%	7.16%	88.00%	47.81%
Colleges Receiving Equalization Funding	80	67.03%	3.94%	83.29%	60.28%
Year 4 - 2005-2006					
Colleges Not Receiving Equalization Funding	27	67.17%	7.30%	88.49%	49.01%
Colleges Receiving Equalization Funding	80	66.34%	4.25%	84.63%	58.29%
Year 5 - 2006-2007					
Colleges Not Receiving Equalization Funding	27	67.00%	7.10%	88.74%	50.47%
Colleges Receiving Equalization Funding	80	66.71%	4.15%	81.82%	59.72%
Year 6 - 2007-2008					
Colleges Not Receiving					

Equalization Funding	27	66.23%	6.23%	88.41%	51.29%
Colleges Receiving Equalization Funding	80	65.90%	4.07%	80.21%	49.76%

In an effort to determine any other differences that existed, it was decided to look at the makeup of each of these sub-populations. Discussion of succcess levels of multi-campus districts versus single-campus districts follows.

Multi-Campus Districts Compared to Single-Campus Districts

The sub-populations of non-funded and funded colleges were each sub-divided into multi-campus and single-campus districts. As stated above, if a single-college district became a multi-campus district during the study, it was treated as a multi-campus district from the beginning of the study.

When looking at the slopes of these four new subgroups, several things stood out. First, in terms of non-funded-equalization colleges, 11 of the 18 multi-campus district colleges had a negative slope, as compared to 3 of the 9 single-campus, non-funded district colleges. Conversely, only 1 of the 18 non-funded, multi-campus district colleges had a positive slope, while 3 of 9 (the same number with a negative slope) of non-funded, single-campus district colleges had a positive slope. Both non-funded, multi-campus district colleges and non-funded, single-campus district colleges had the same percentage (33.33%) of flat slopes--with 6 of the 18 and 3 of the 9, respectively.

The slopes for funded colleges were reverse of the non-funded colleges. Instead of the multi-campus districts having a greater percentage of negative slopes, the multi-campus, funded district colleges only had 2 of the 43 with a negative slope. The funded,

single-campus district colleges had 5 of the 37 with a negative slope. On the other hand, both sub-populations of funded colleges received nearly the same percentages for positive, with 10 of the 43 for funded, multi-campus district colleges and 10 of 37 funded, single-campus district colleges. Lastly, a greater number of funded, multi-campus district colleges (31 of the 43) had a flat slope as compared to funded, single-campus district colleges where only 22 of the 37 had a flat slope.

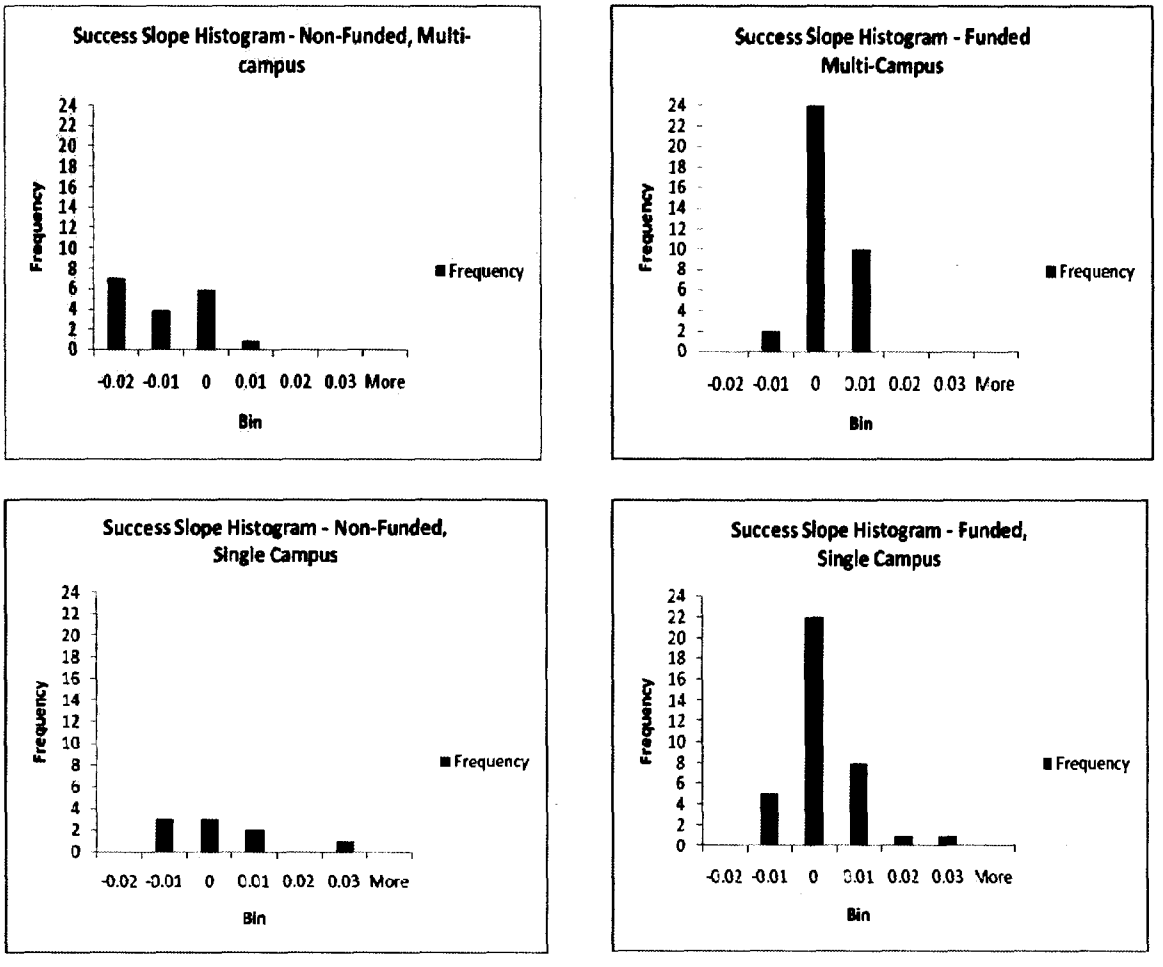

Figure 6. Histograms of funded- and non-funded success slopes divided into multi-campus and single-campus districts.

When comparing the means of the four sub-populations, the non-funded, single-campus district colleges had the highest means for the period studied. Conversely, the

funded, multi-campus district colleges and funded, single-campus district colleges consistently received the lowest mean scores for the years of the study. Interestingly, the non-funded, multi-campus district colleges started the study above the average of the all college mean, but dropped below the all college mean in Year 3 of the study (Figure 7).

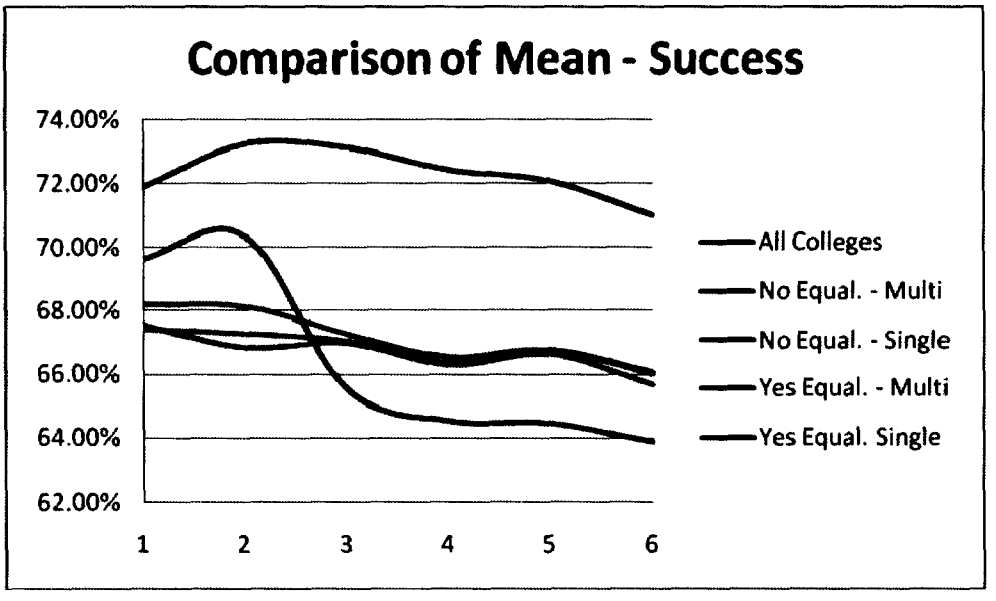

Figure 7. Comparisons for means, maximums, and minimums divided into four subgroups and compared to all colleges.

The highest mean for non-funded colleges in Year 2 (2003-2004) at a level of 73.24% for single-campus district colleges and the lowest was in Year 6 (2007-2008) for multi-campus districts at the rate of 63.88%. For funded colleges, the highest level was in Year 1 (2001-02), with 67.57% for single-campus district colleges. Conversely, the lowest mean for funded campuses was in Year 6 (2007-2008) also for single-campus district collegess at a level of 65.66%.

Table 5

Descriptive Statistics for Course Success: Four Subgroups

	N	Mean	Std. Dev.	Max	Min
Year 1 - 2002-2003					
Multi- Campus Districts Not Receiving Equalization Funding	18	69.64%	6.24%	76.37%	50.00%
Single-Campus Districts Not Receiving Equalization Funding	9	71.89 %	11.37%	89.56%	46.94%
Multi-Campus Districts Receiving Equalization Funding	43	67.42%	3.86%	82.92%	62.27%
Single-Campus Districts Receiving Equalization Funding	37	67.57%	3.74%	75.22%	58.30%
Year 2 - 2003-2004					
Multi- Campus Districts Not Receiving Equalization Funding	18	70.36 %	4.35%	76.63%	62.68%
Single-Campus Districts Not Receiving Equalization Funding	9	73.24%	7.80%	89.14%	63.59%
Multi-Campus Districts Receiving Equalization Funding	43	67.28%	4.16%	83.64%	59.37%
Single-Campus Districts Receiving Equalization Funding	37	66.86%	3.86%	73.85%	58.15%

Year 3 - 2003-2004

Multi- Campus Districts Not Receiving Equalization Funding	18	65.54%	5.54%	72.62%	47.81%
Single-Campus Districts Not Receiving Equalization Funding	9	73.13%	7.63%	88.00%	64.89%
Multi-Campus Districts Receiving Equalization Funding	43	67.06%	4.28%	83.29%	60.30%
Single-Campus Districts Receiving Equalization Funding	37	67.00%	3.57%	73.21%	60.28%

Year 4 - 2005-2006

Multi- Campus Districts Not Receiving Equalization Funding	18	64.53%	5.21%	72.22%	49.01%
Single-Campus Districts Not Receiving Equalization Funding	9	72.43%	8.30%	88.49%	63.62%
Multi-Campus Districts Receiving Equalization Funding	43	66.39%	4.69%	84.63%	58.91%
Single-Campus Districts Receiving Equalization Funding	37	66.30%	3.74%	74.27%	58.29%

Year 5 - 2006-2007

Multi- Campus Districts Not Receiving Equalization Funding	18	64.45%	4.89%	71.49%	50.47%
Single-Campus Districts Not Receiving Equalization Funding	9	72.08%	8.33%	88.74%	65.12%
Multi-Campus Districts Receiving Equalization Funding	43	66.77%	4.33%	81.82%	60.00%
Single-Campus Districts Receiving Equalization Funding	37	66.63%	3.99%	88.30%	59.72%

Year 6 - 2007-2008

Multi- Campus Districts Not Receiving Equalization Funding	18	63.88%	4.12%	69.86%	51.29%
Single-Campus Districts Not Receiving Equalization Funding	9	71.02%	7.19%	88.41%	65.04%
Multi-Campus Districts Receiving Equalization Funding	43	66.11%	3.93%	80.10%	57.15%
Single-Campus Districts Receiving Equalization Funding	37	65.66%	4.27%	80.21%	49.76%

While the above calculations compare multi-campus and single-campus district colleges, it became clear that the graphs of the Los Angeles Community College district, which was a non-funded, multi-campus district had some unique characteristics in the

college's success graphs. The following section pulled the 10 colleges/centers in the Los Angeles district out of the sub-population and additional comparisons were made.

Comparison of Sub-Populations with Los Angeles District Colleges Extracted

In an effort to look at non-funded and funded colleges in closer detail, a comparison was first made of the means of these two subgroups. With n=27 for non-funded colleges, and n=80 for funded colleges, at first glance it appeared that there was less of a gap between the success numbers at the end of the study.

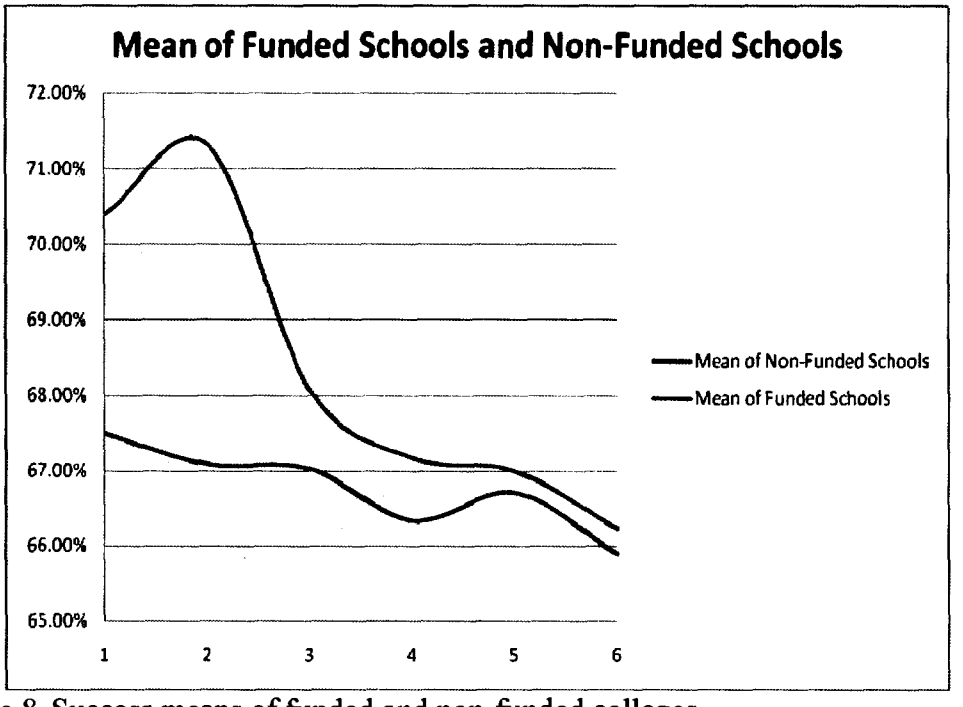

Figure 8. Success means of funded and non-funded colleges.

As noted above, however, 10 of the colleges/centers in the non-funded population belonged to the Los Angeles Community College District. Given that many of the colleges/centers in this district had similar, uniquely shaped lines (Appendix A), a decision was made to pull out those colleges and then compare the two subgroups. In the

following graph, n=17 for non-funded colleges, n=10 for non-funded colleges/centers in the Los Angeles Community College District, and n=80 for funded colleges. When those calculations were completed, the results changed a bit. It became very clear that colleges/centers in the Los Angeles district were not reflective of the other non-funded colleges. As Figure 9 shows, with the Los Angeles colleges/centers removed from the non-funded population, the results were very different. No longer did the means get markedly closer as they did in the above graph.

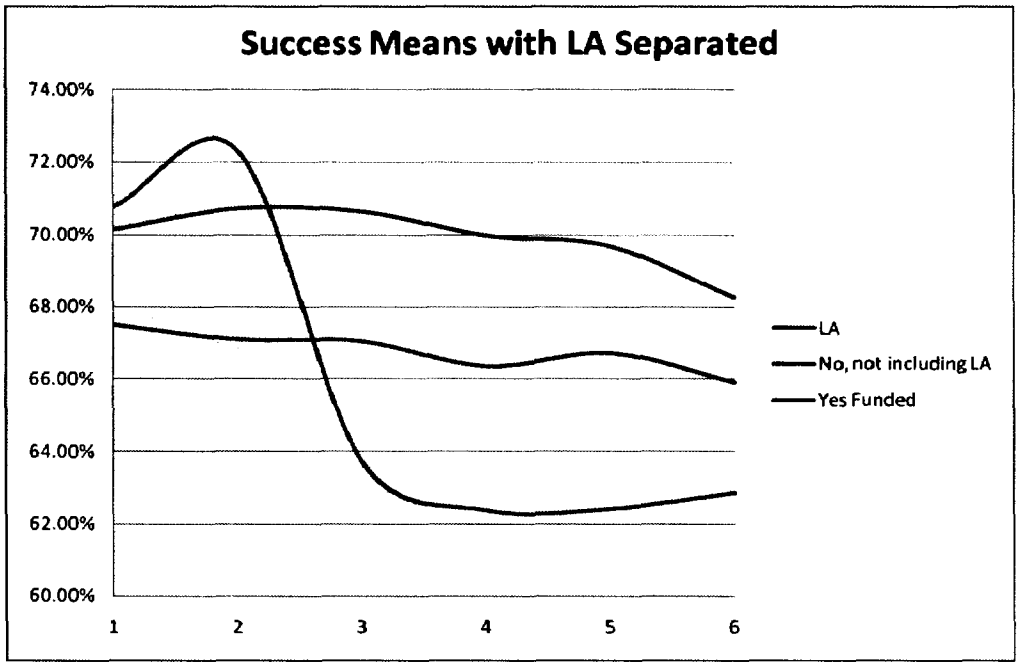

Figure 9. Success means of non-funded colleges with Los Angeles district's colleges extracted.

To look at the numbers that comprise these means, the two graphs were completed (Figure 10). These graphs showed that there was a similarity of shape in the Los Angeles community colleges' success lines. In addition, while Los Angeles

community colleges had higher success rates early in the study, the low success rates later in the study were significant enough to pull down the slopes and means of the non-funded colleges when all were compared. When looking at these populations separately, it can be seen that overall there are more colleges outside the Los Angeles Community College District that had approximately 70% success rates over time than those inside the Los Angeles Community College District.

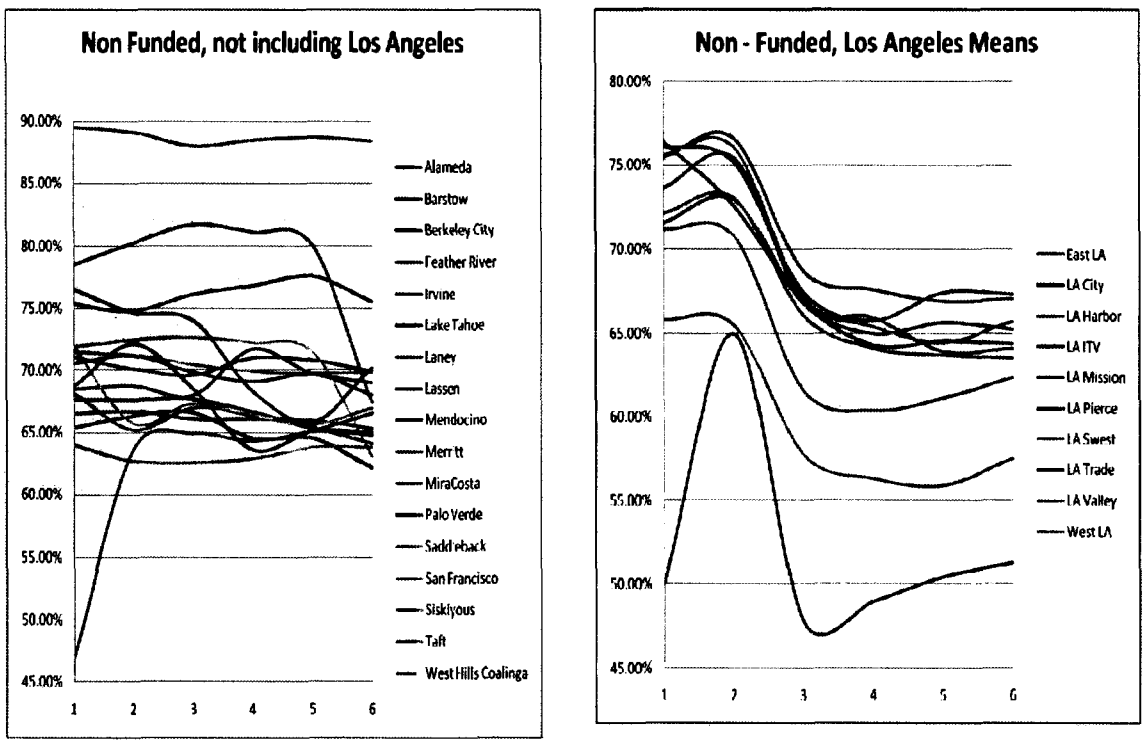

Figure 10. A comparison of non-funded colleges' success graphs, with the Los Angeles district's colleges separated.

A new set of histograms was prepared to compare this new set of sub-populations. In terms of non-funded colleges exclusive of those in the Los Angeles District, 5 of the 17 had negative slopes, as compared with 10 of the 10 in the Los Angeles Community

College District. Conversely, 6 of the 17 non-funded, other colleges had a positive slope, while 0 of the 10 Los Angeles community colleges had a positive slope.

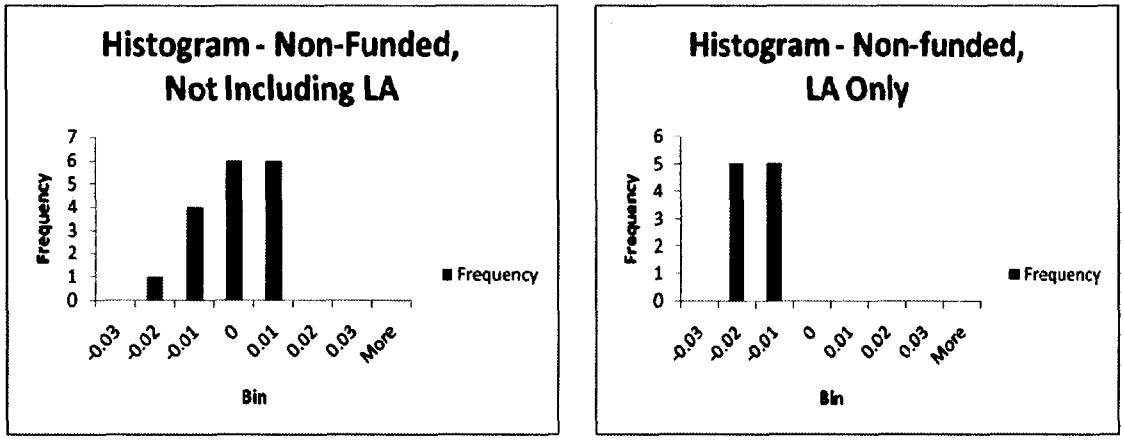

Figure 11. Comparison of histograms of non-funded colleges.

Comparison of Success Means for Basic Aid Districts and Other Non-Funded Colleges

As was discussed in the Literature Review, there are three Basic Aid Districts in California: Marin, Mira Costa, and South Orange which do not receive any State contribution to make up the deficit between the FTES revenue cap and the student tuition and local property tax funds. Also, previously noted, Marin was not used for this study, as the data available were incomplete.

To see if there was a difference with these Basic Aid Districts included, a new mean graph was drawn. It showed that while the Basic Aid Districts have a lower student success mean in Year 1 and Year 2 of the study, for Years 3-5 they were higher. In Year 6, the mean success rates of Basic Aid Districts were comparable to other non-funded colleges (Figure 12).

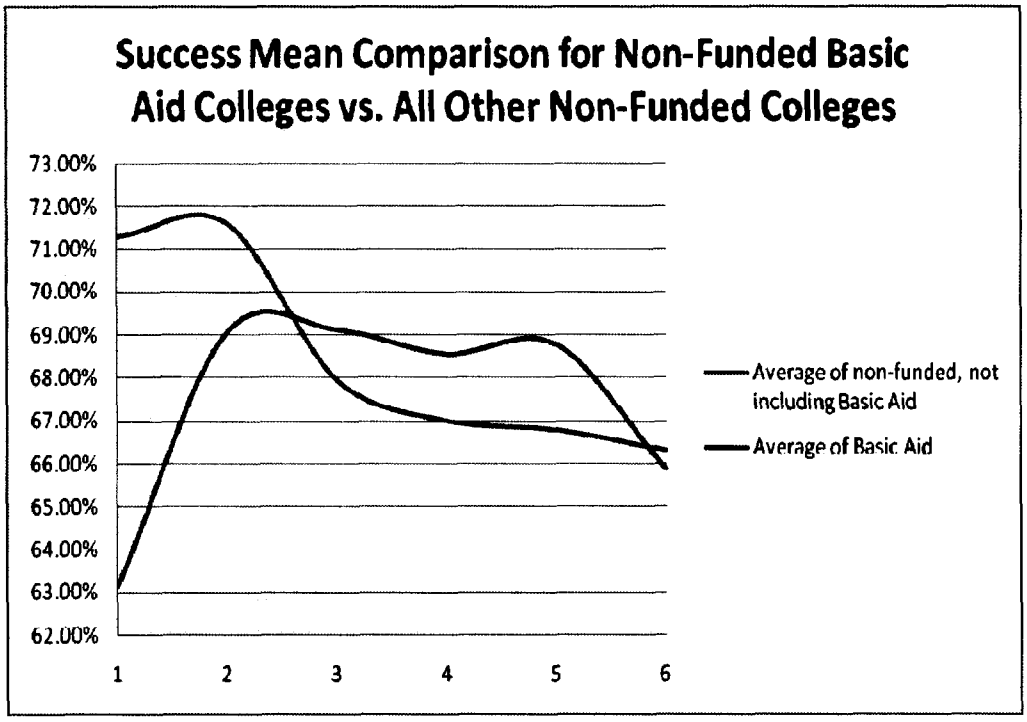

Figure 12. Success mean comparison for non-funded basic aid colleges vs. all other non-funded colleges.

Because of the differences with the Los Angeles Community College District, the next calculations extracted both the Basic Aid District and the Los Angeles District's colleges and compared those to the other non-funded colleges. Again, the Los Angeles District's mean success line had the unique pattern, but again, the results change. Excluding both Basic Aid colleges and colleges in the Los Angeles Community College District, the overall success of the other non-funded colleges was higher than that of either of the other two groups (Figure 13).

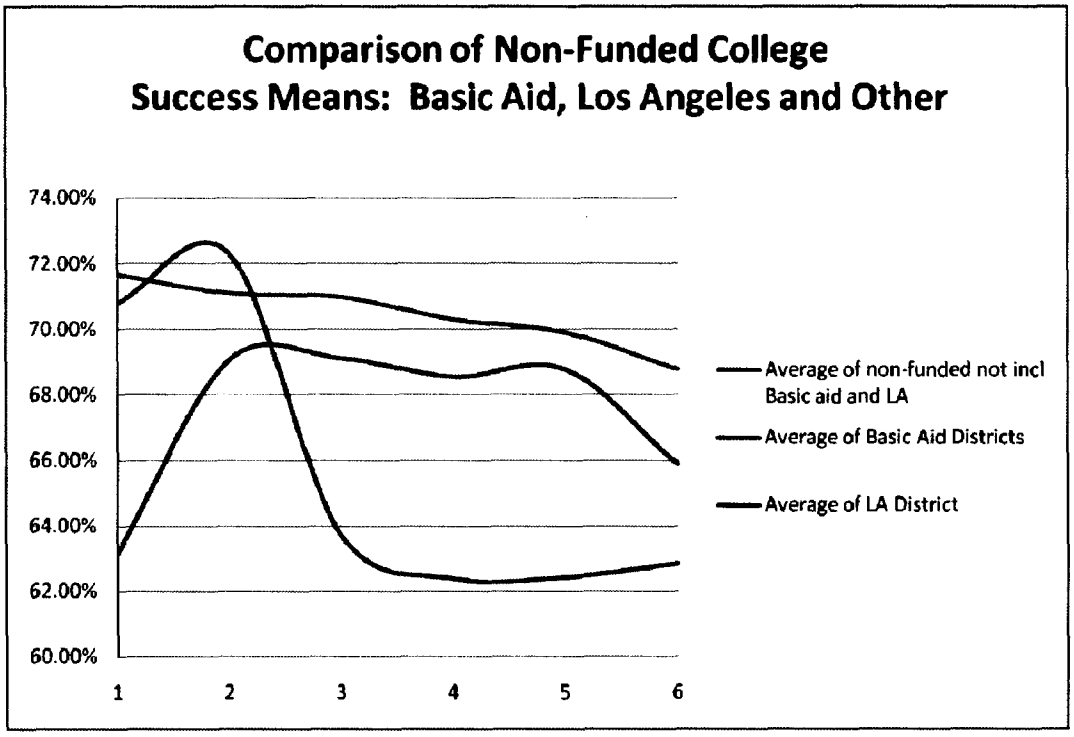

Figure13. Comparison of non-funded college success means: Basic Aid, Los Angeles, and other.

The graph in Figure 13 indicated that the non-funded colleges of Basic Aid and Other still have a higher success mean than the funded colleges, once again that the Los Angeles Community College District is low enough to pull down the success rate means of non-funded colleges. While Basic Aid Districts had a higher success rate for Years 2-5 of the study, in Year 6, those figures were very comparable. Conversely, the success means of non-funded colleges that did not include either Basic Aid Districts or Los Angeles Colleges remained greater throughout the study (Figure 14).

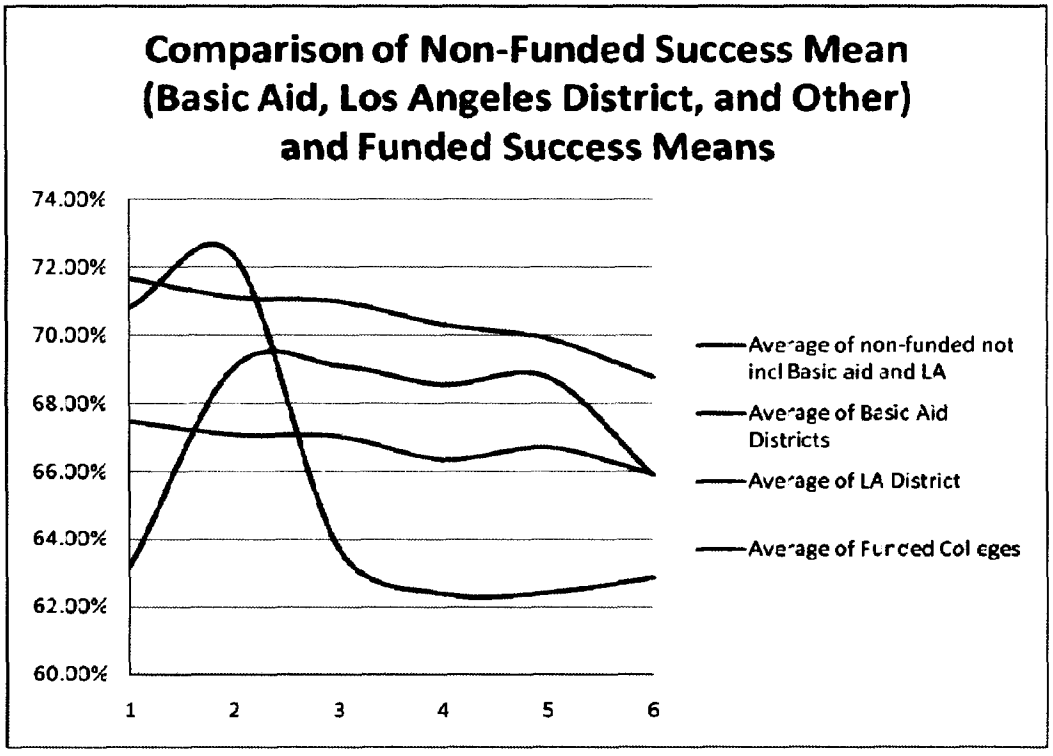

Figure14. Comparison of non-funded (Basic Aid, Los Angeles, and other) and funded success means.

The above section demonstrated that there were many different ways to research students' success in courses. In addition, there were many different ways to compare the success numbers. Success was only one of the two factors that this dissertation addressed; course retention was the other. The next section evaluated retention based on the same steps that were taken to evaluate course success.

Student Course Retention Rates

To look at equalization funding and its association with student course retention several approaches were taken. First, individual colleges' course retention rates were evaluated by reviewing the smoothing of the empirical growth plots and by categorizing with the shape of other community colleges within the California Community College System. Second, the total population was split into the same two sub-groups—non-funded colleges and funded colleges. For these two subgroups, slopes and fitted trajectories were superimposed on empirical growth plots. Third, histograms were produced to show the frequency of slopes for both of the subgroups. Lastly, descriptive statistics regarding means, maximums, and minimums were evaluated.

Comparison of Total Population

First, the empirical growth plots were smoothed for course retention for each of the colleges. As with the success portion of this study, these growth plots required no assumptions, but instead provided numeric summaries for each data set. For this portion of the study, there was not a separation of non-funded and funded colleges. This allowed an overall picture of what occurred in each of the college's course retention for change-over-time. In addition, this process allowed each college's graph to be evaluated for elevation, shape, and tilt. Appendix D shows the change-over-time course retention graphs for each college.

During review of the 107 community college course retention graphs, it was found that 15 have flat or near-flat lines. These colleges included Copper Mountain, Cuesta, Cuyamaca, Grossmont, Laney, Mt. San Jacinto, Ohlone, Orange Coast, San

Bernardino, San Diego City, San Diego Mesa, San Francisco, Santa Ana, Santa Monica, and Taft. Six colleges showed a positive fitted trajectory. Eight of the colleges had relatively flat lines and then a rise at the end of the study: Citrus, Coastline, Evergreen Valley, Sierra, Merritt, Santa Barbara, Napa, and Golden West. On the other hand, 14 of the colleges (Monterey, Mt. San Antonio, Berkeley City, Cerritos, Diablo Valley, American River, Butte, Irvine, Saddleback, Oxnard, Columbia, Cosumnes River, Foothill, and Sacramento City) had flat-line retention rates and then either sharp decreases toward the end of the study.

Four of the colleges (Crafton Hills, Cypress, Moorpark, and Los Angeles Harbor) showed slight positive slope (East Los Angeles and San Joaquin Delta), while three colleges showed slightly decreasing retention rates: Pasadena, Riverside, and Santiago Canyon.

Nine colleges showed some type of "s-pattern" meaning at the beginning of the study retention rates were higher and then lowered, then raised, and then lowered like a letter "s" on its side. While retention rates at six of the colleges (Alameda, Antelope Valley, Mendocino, Redwoods, Southwestern, and Victor Valley) showed a flat "s" pattern, three colleges (Desert, Los Angeles ITV, and West Valley) showed larger "s" curves.

A total of 18 colleges in the study showed some type of "u-shaped" curve in retention rates for the period studied. A "u-shape" is defined as retention rates were higher at the beginning and end of the study period, with lower retention rates during the middle years of the study. At three of these colleges, retention rates were in the pattern of

a "reverse-u" (or upside down "u-pattern"). Palomar had the most significant "reverse-u" shape, while Fullerton and Porterville showed smaller "reverse-u" patterns. Ten of the colleges showed a "small u" or "flat u" pattern: Allan Hancock, Cerro Coso, Hartnell, Skyline, Las Positas, Reedley, San Diego Miramar, Shasta, Yuba, and San Mateo. Two colleges (Barstow and Gavilan) showed a "u" pattern early in the study and then the retention lines flattened out at the end of the six-year period. On the contrary, three of the colleges (Long Beach, Deanza, and Sequoias) showed relatively flat retention lines at the beginning of the study, but finished the study with flat "u" shapes.

Lastly, 32 colleges had retention lines of no distinct or recognizable shape: Bakersfield, Cabrillo, Canada, Canyons, Chabot Hayward, Chaffey, Contra Costa, El Camino, Feather River, Fresno City, Glendale, Imperial, Los Angeles City, L.A. Mission, Los Angeles Pierce, Los Angeles Southwest, Los Angeles Trade, Los Angeles. Valley, Lake Tahoe, Lassen, Los Medanos, Feather River, Fresno City, Glendale, Imperial, Los Angeles City, Los Angeles Mission, Los Angeles Pierce, Los Angeles Southwest, Los Angeles Trade, Los Angeles Valley, Lake Tahoe, Lassen, Los Medanos, Merced, Mission, Modesto, Palo Verde, Rio Hondo, San Jose City, Santa Rosa, Siskiyous, Ventura, and West Hills-Coalinga.

Comparison of Sub-Populations

Next, the population was split into subgroups of non-funded and funded colleges. As with the success portion of this research, the *n* for non-funded colleges was 27, and *n* for funded colleges was 80.

Slope Change over Time by Sub-Population

Next, each college's funding status and slope of the course retention lines was identified. The average slope for all colleges' course retention lines over the six-year time period was -0.0003. Non-funded colleges had a slope of -0.0013 while the average slope for funded colleges was 0.0000 (Table 6).

Table 6

College, Equalization Funding Status, and Course Retention Slope Comparison

College	Non-Funded or Funded College	Retention Slope
Alameda	Non-Funded	-0.0023
Allan Hancock	Funded	-0.0010
American River	Funded	-0.0062
Antelope Valley	Funded	-0.0070
Bakersfield	Funded	0.0027
Barstow	Non-Funded	-0.0201
Berkeley City	Non-Funded	-0.0035
Butte	Funded	-0.0050
Cabrillo	Funded	-0.0004
Canada	Funded	0.0028
Canyons	Funded	0.0102
Cerritos	Funded	-0.0029
Cerro Coso	Funded	0.0015
Chabot Hayward	Funded	0.0003
Chaffey	Funded	0.0111
Citrus	Funded	0.0071
Coastline	Funded	0.0100
Columbia	Funded	-0.0048
Compton	Funded	-0.0121
Contra Costa	Funded	-0.0032
Copper Mountain	Funded	0.0006
Cosumnes River	Funded	-0.0085
Crafton Hills	Funded	0.0039
Cuesta	Funded	-0.0024

Cuyamaca	Funded	-0.0019
Cypress	Funded	0.0031
Deanza	Funded	-0.0003
Desert	Funded	0.0058
Diablo Valley	Funded	-0.0038
East L.A.	Non-Funded	0.0049
El Camino	Funded	-0.0047
Evergreen Valley	Funded	0.0030
Feather River	Non-Funded	0.0003
Foothill	Funded	-0.0070
Fresno City	Funded	-0.0006
Fullerton	Funded	-0.0008
Gavilan	Funded	-0.0009
Glendale	Funded	-0.0048
Golden West	Funded	0.0018
Grossmont	Funded	0.0004
Hartnell	Funded	0.0018
Imperial	Funded	-0.0012
Irvine	Non-Funded	-0.0082
Lake Tahoe	Non-Funded	0.0092
Laney	Non-Funded	0.0014
Las Positas	Funded	0.0009
Lassen	Non-Funded	-0.0122
Long Beach	Funded	-0.0142
Los Angeles City	Non-Funded	-0.0023
Los Angeles Harbor	Non-Funded	0.0061
Los Angeles ITV	Non-Funded	0.0087
Los Angeles Mission	Non-Funded	-0.0012
Los Angeles Pierce	Non-Funded	0.0037
Los Angeles Southwest	Non-Funded	0.0032
Los Angeles Trade	Non-Funded	-0.0021
Los Angeles Valley	Non-Funded	0.0020
Los Medanos	Funded	-0.0008
Mendocino	Non-Funded	-0.0007
Merced	Funded	0.0031
Merritt	Non-Funded	0.0014
Mira Costa	Non-Funded	-0.0063
Mission	Funded	0.0039

Modesto	Funded	-0.0010
Monterey	Funded	-0.0046
Moorpark	Funded	0.0045
Mt San Antonio	Funded	-0.0040
Mt. San Jacinto	Funded	0.0024
Napa	Funded	-0.0018
Ohlone	Funded	0.0010
Orange Coast	Funded	0.0007
Oxnard	Funded	-0.0022
Palo Verde	Non-Funded	-0.0035
Palomar	Funded	0.0165
Pasadena	Funded	-0.0050
Porterville	Funded	0.0041
Redwoods	Funded	-0.0027
Reedley College	Funded	-0.0027
Rio Hondo	Funded	-0.0008
Riverside	Funded	-0.0072
Sacramento City	Funded	-0.0069
Saddleback	Non-Funded	-0.0034
San Bernardino	Funded	0.0004
San Diego City	Funded	0.0026
San Diego Mesa	Funded	0.0021
San Diego Miramar	Funded	0.0005
San Francisco	Non-Funded	-0.0012
San Joaquin Delta	Funded	0.0035
San Jose City	Funded	-0.0034
San Mateo	Funded	0.0032
Santa Ana	Funded	0.0000
Santa Barbara	Funded	0.0057
Santa Monica	Funded	-0.0003
Santa Rosa	Funded	0.0028
Santiago Canyon	Funded	-0.0046
Sequoias	Funded	-0.0044
Shasta	Funded	-0.0010
Sierra	Funded	0.0027
Siskiyous	Non-Funded	-0.0156
Skyline	Funded	0.0003
Southwestern	Funded	0.0035

Taft	Non-Funded	0.0016
Ventura	Funded	-0.0007
Victor Valley	Funded	0.0078
West Hills Coalinga	Non-Funded	0.0023
West Los Angeles	Funded	0.0025
West Valley	Funded	0.0113
Yuba	Funded	-0.0003
Average for All Colleges		**-0.0003**
Average for Non-Funded Colleges		**-0.0013**
Average for Funded Colleges		**0.0000**

Next, in an effort to see the individual slopes in a graphical reference, each of the college's course retention rates was used to fit trajectories on superimposed empirical growth plots. Again, the two sets of subgroups were used. For non-funded colleges, the R^2 ranged from .0012 for Feather River to .9078 for Lassen. The slope of the fitted trajectories ranged from -0.021 for Barstow to .0092 for Lake Tahoe. The specific graphs have been shown in Appendix E. Of the 27 non-funded colleges, 2 (7.41%) had a negative fitting trajectory, 15 (55.56%) had a relatively flat trajectory, and 10 (37.04%) had an increasing trajectory.

For the funded colleges, the R^2 ranged from .0002 for Santa Ana to .9632 for Pasadena. The slope of the fitted trajectories for funded colleges ranged from -0.0142 for Long Beach to 0.0165 for Palomar. The graphs with fitted trajectories for funded colleges

have been shown in Appendix F. Of the 80 funded colleges, 38 had a negative fitting trajectory, 39 had a relatively flat trajectory, and 3 had an increasing trajectory.

As with the success slopes two histograms were created to show the frequency of slopes for both of the subgroups (Figure 13). While 3 of the 27 of the non-funded colleges had a negative slope, only 2 of the 80 funded colleges had a negative slope. Conversely, 13 of the 27 non-funded colleges had a positive slope, and 39 of the 80 funded colleges had a positive slope. Colleges which had a flat slope included 11 of the 27 non-funded colleges and 39 of 80 funded colleges.

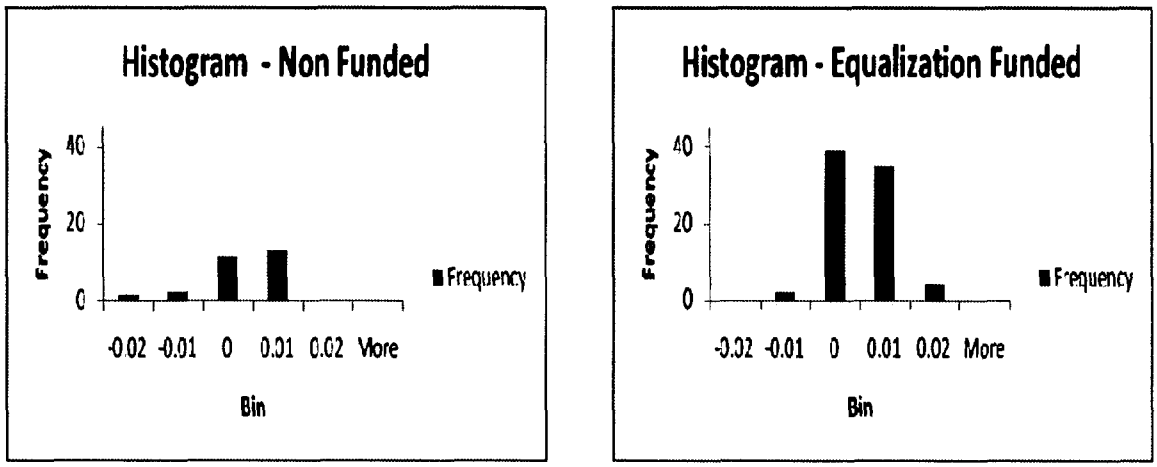

Figure14. Histograms of funded and non-funded retention slopes.

In order to get a more detailed view of the comparison of retention rate distribution two plots were completed. The first one (Figure 14) showed the retention rates of the 27 non-funded colleges studied. The college that maintained the highest retention rates consistently was Taft with Barstow having the highest retention rates in Year 2. On the reverse Los Angeles ITV reported the lowest course retention rates during the entire study. Although higher than Los Angeles ITV, Laney and Berkeley City

maintained, respectively, the second and third lowest retention rates for the study consistently.

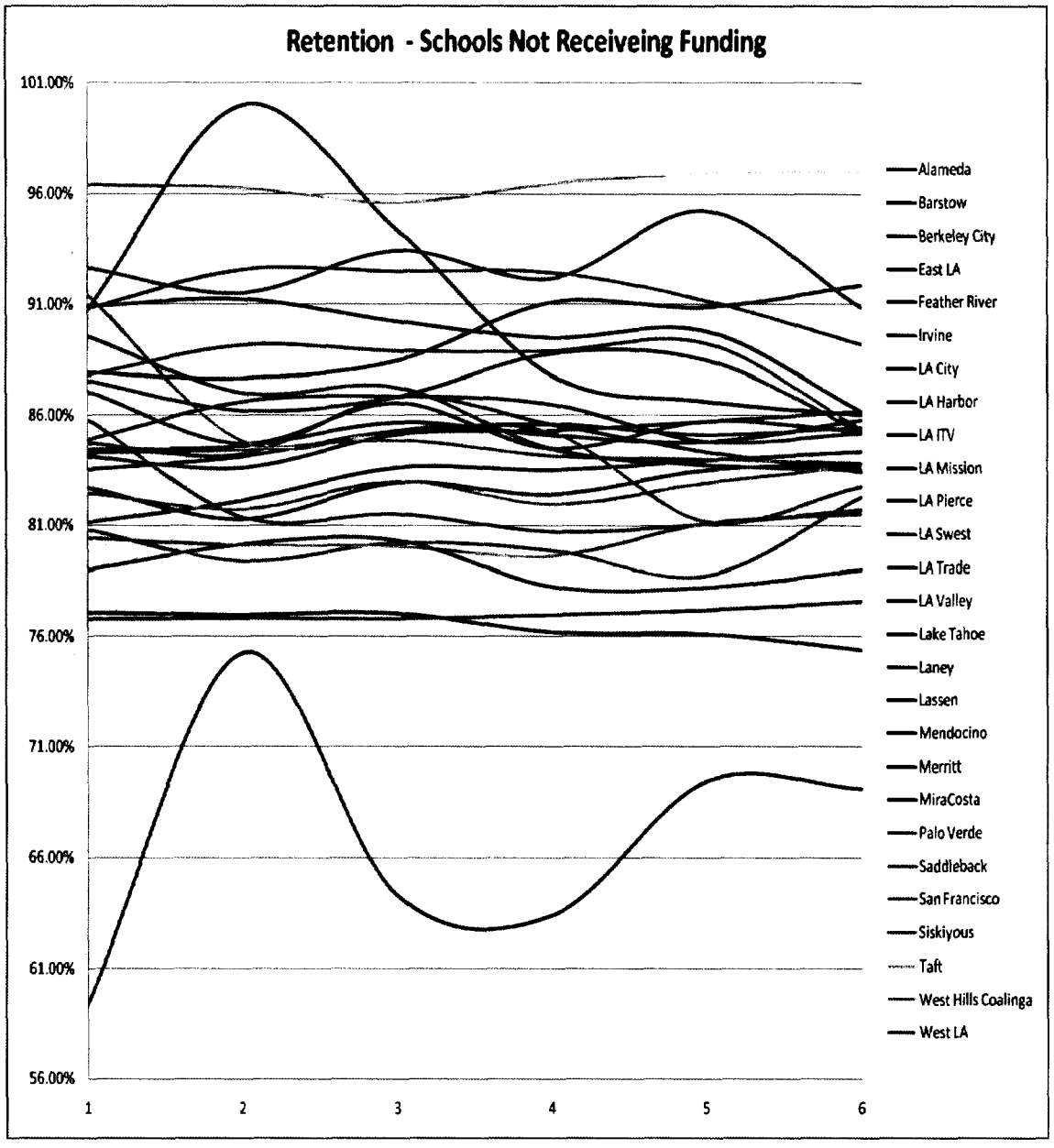

Figure15. Retention rates of non-funded colleges.

For funded colleges (n = 80) a similar chart was created (Figure 16). No one college maintained the highest course retention rates consistently throughout the years of the study. Maintaining the lowest course retention rates consistently, however, was Compton College. And starting in Year 3 of the study, Long Beach received near to the lowest retention rates.

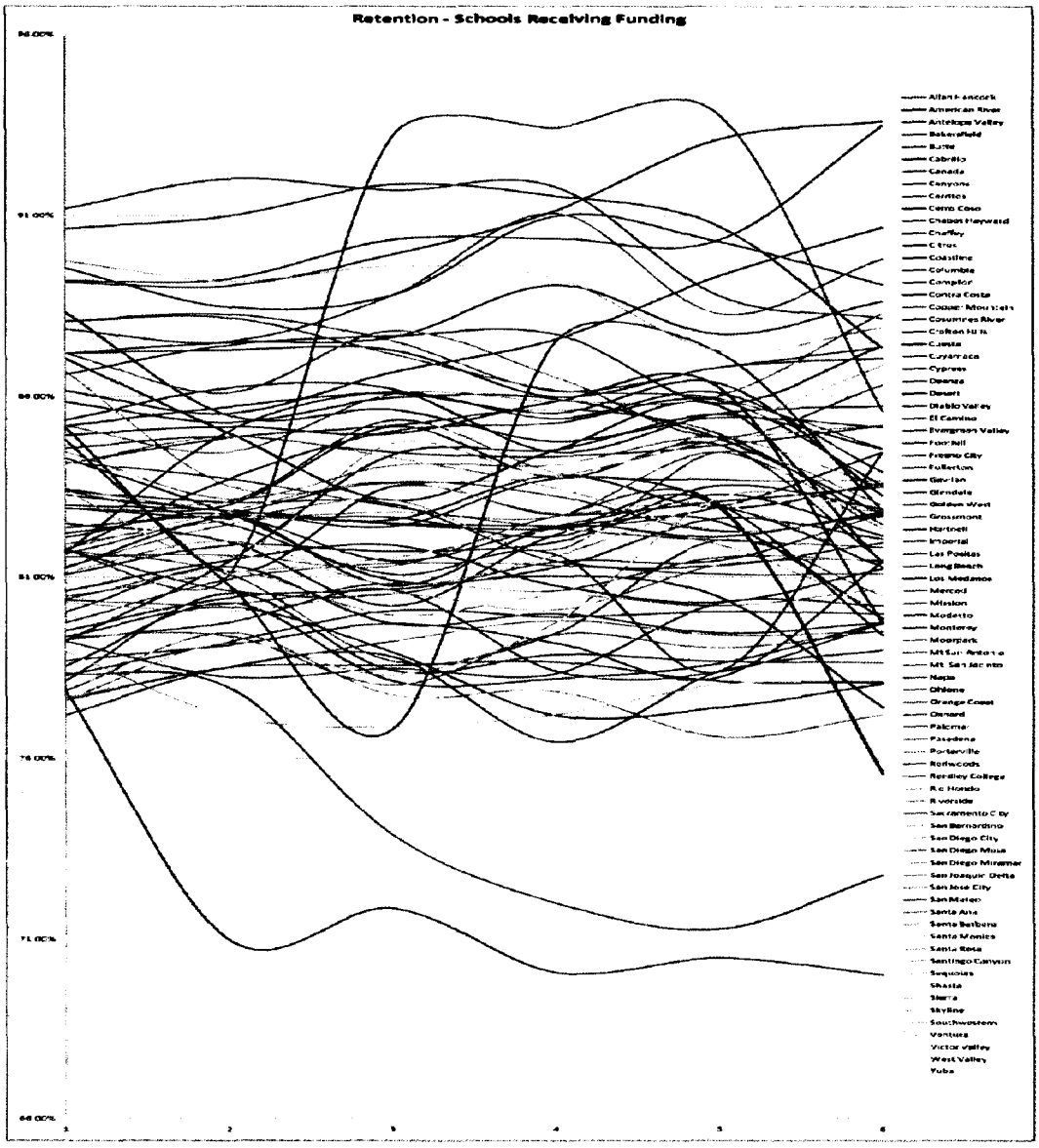

Figure16. Retention rates for funded colleges.

To further specify the differences between the two groups, the means of student success percentages were calculated (Figure 6 and Table 7).

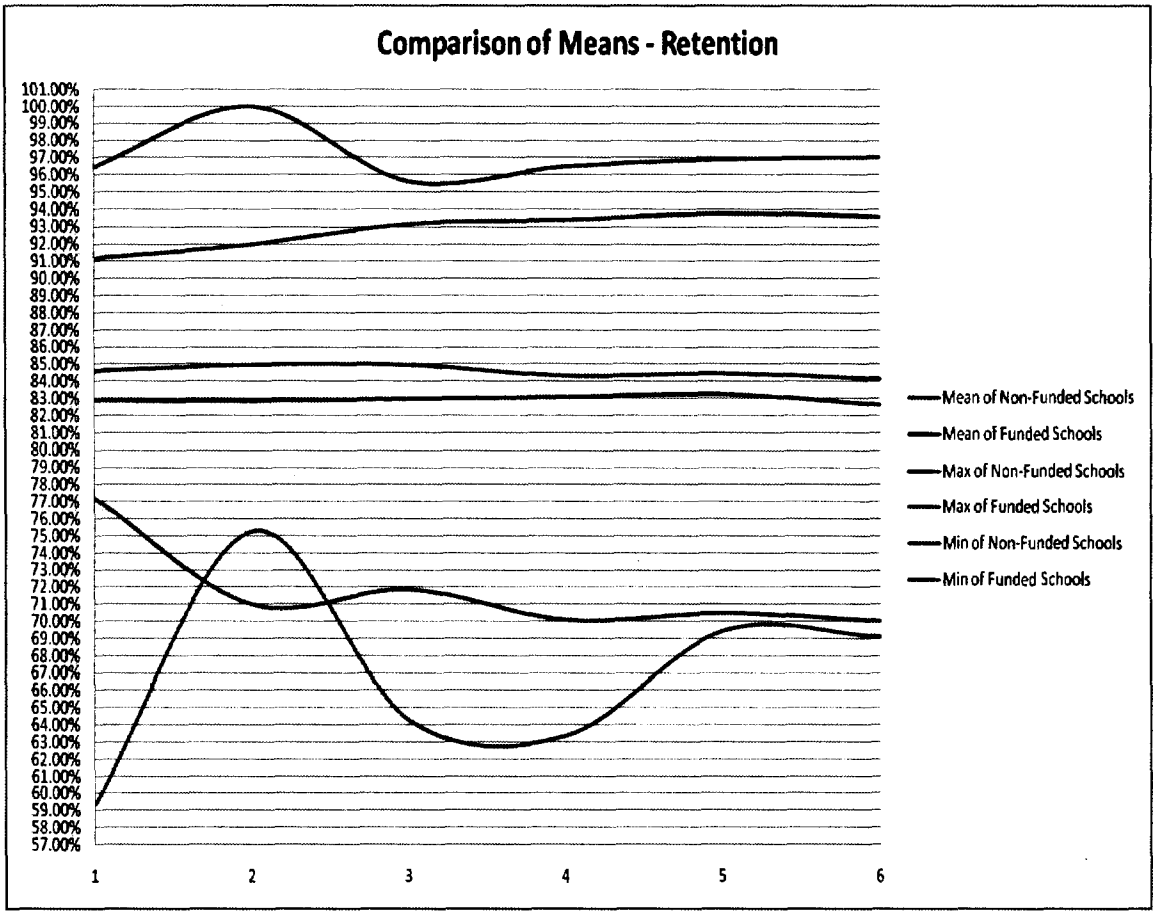

Figure17. Retention graphs of means, maximums, and minimums for non-funded and funded colleges.

For non-funded colleges the highest retention rate mean was in Year 2 (2003-2004) at a level of 84.97% and the lowest mean was in Year 6 (2007-2008) with a course retention rate of 84.14%. For funded colleges the highest level was in Year 5 (2005-06) with 83.25%. And like the other group the lowest retention rate for this group was in Year 6 with a rate of 82.68%. The greatest differential between these groups was in Year 2 with a difference of 2.80% and the smallest was in Year 5 with a differential of 1.20%.

It is interesting to note, however, that Years 1, 2, and 3 had the greatest differential in success rates with 1.71%, 2.08%, and 1.96%, respectively. In Years 4 and 5 that number dropped to 1.22%, and 1.20% . In Year 6 the differential increased to 1.46%.

The retention rate maximum points varied more than the retention means. In Year 1 the differential was 5.23% with the maximum retention rate for a non-funded college and a funded college. In Year 2 that difference widened to 7.98%, but the gap closed again for Years 3-6. For the retention rate minimums in Year 1 there was a 17.86% gap between non-funded colleges and funded colleges with funded colleges having a higher minimum retention than non-funded colleges. Although Year 2 brought a reverse, Year 3 went back to funded colleges having a higher minimum. In short the standard deviation for non-funded colleges remained between 7.16% and 5.22%, while the standard deviation for funded colleges was between 4.23% and 3.47%.

Table 7
Descriptive Statistics for Course Retention: Two Subgroups

	N	Mean	Std. Dev.	Max	Min
Year 1 - 2002-2003					
Colleges Not Receiving Equalization Funding	27	84.61%	6.99%	96.42%	59.34%
Colleges Receiving Equalization Funding	80	82.90%	3.56%	91.19%	77.20%
Year 2 - 2003-2004					
Colleges Not Receiving Equalization Funding	27	84.97%	5.81%	99.99%	75.26%
Colleges Receiving Equalization Funding	80	82.89%	3.47%	92.01%	70.98%

Year 3 - 2004-2005					
Colleges Not Receiving Equalization Funding	27	84.96%	6.36%	95.60%	64.28%
Colleges Receiving Equalization Funding	80	83.00%	4.08%	93.19%	91.86%
Year 4 - 2005-2006					
Colleges Not Receiving Equalization Funding	27	84.32%	6.42%	96.47%	63.37%
Colleges Receiving Equalization Funding	80	83.10%	4.23%	93.43%	70.08%
Year 5 - 2006-2007					
Colleges Not Receiving Equalization Funding	27	84.45%	5.86%	96.89%	69.45%
Colleges Receiving Equalization Funding	80	83.25%	4.10%	93.79%	70.48%
Year 6 - 2007-2008					
Colleges Not Receiving Equalization Funding	27	84.14%	5.22%	97.01%	69.13%
Colleges Receiving Equalization Funding	80	82.68%	4.08%	93.61%	70.02%

Multi-Campus Districts Compared to Single-Campus Districts

The sub-populations of non-funded and funded colleges were each separated into multi-campus and single-campus districts. When looking at the slopes of these now four subgroups, the results were different for retention than they were for success. First, the average slope for all colleges was -.00031. The only two other groups showed a negative slope for retention were non- equalization-funded, single-campus district colleges and funded, multi-campus district colleges, -.00527 and -.00028, respectively. Subgroups

with a positive slope retention graph included non-funded, multi-campus district colleges (0.00068) and funded, single-campus district colleges (0.00038).

There were not any non-funded, multi-campus district colleges which had a negative slope. The non-funded, single-campus district colleges had 3 out of 9 of the sub-population with a negative slope. On the other hand the non-funded, multi-campus district colleges had 10 out of 18 with a positive slope, and there were 3 of 9 non-funded, single district colleges with a positive slope. Lastly, a greater percentage (8 out of 18) of the non-funded, multi-campus district colleges had a flat slope as compared to none of the non-funded, single-campus district colleges having a flat slope.

For the funded subgroups multi-campus and single-campus districts had nearly the same percentage of colleges that had a negative slope with 1 out of 43 and 1 out of 37, respectively. Conversely, 23 of the 43 funded, multi-campus district colleges had a positive slope, and 16 of the 37 funded, single-campus district colleges had a positive slope. For funded, multi-campus districtcolleges, 19 of the 43 had flat slopes, while 20 of the 37 funded, single-campus district colleges had a flat slope.

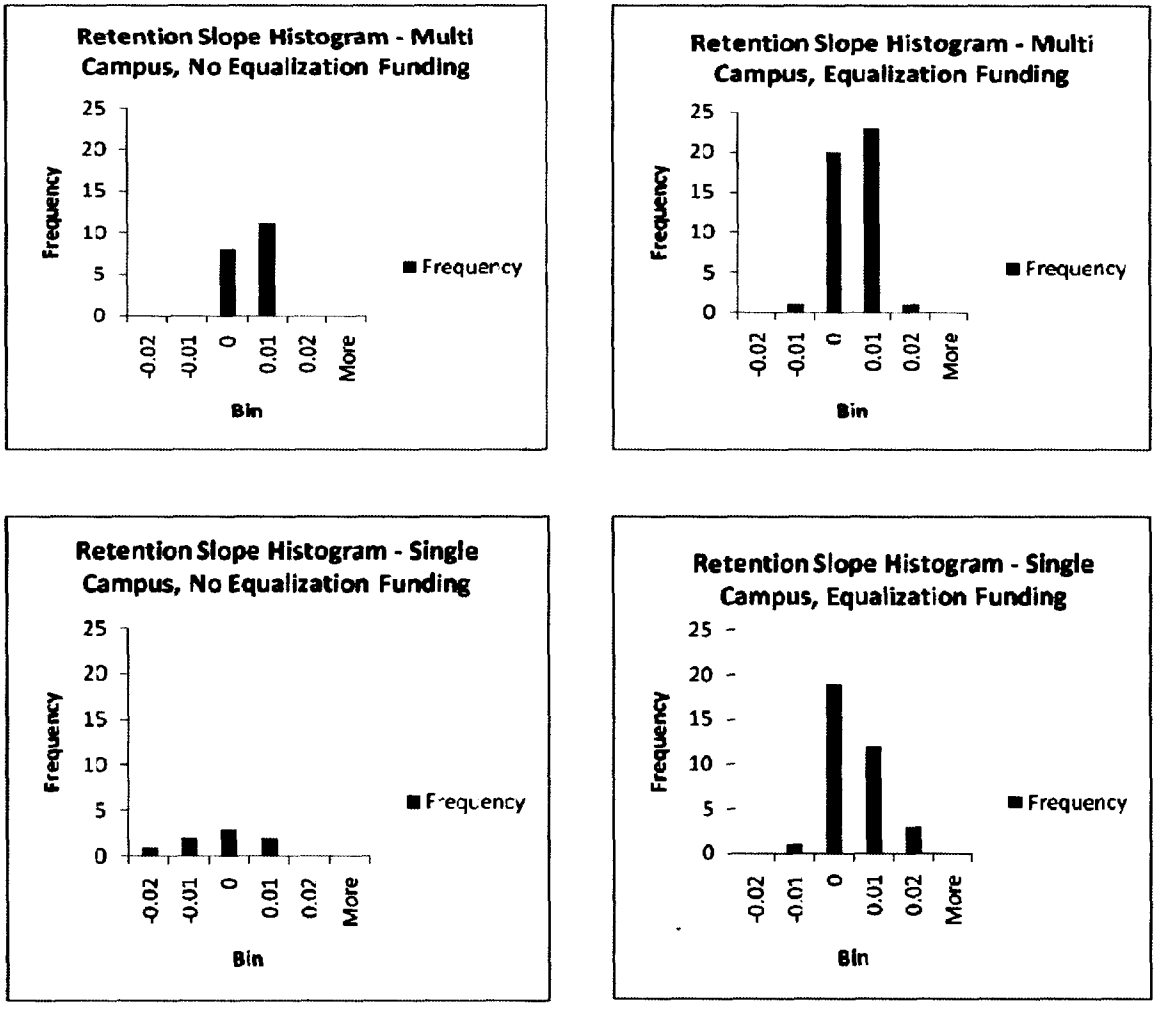

Figure18. Histograms of funded and non-funded course retention slopes segregated by multi-campus and single-campus district colleges.

When comparing the means of the four sub-populations, the non-funded, single-campus district colleges had the highest means for retention the period studied. Conversely, although not by much, funded, multi-campus district colleges received the lowest mean scores for the period studied.

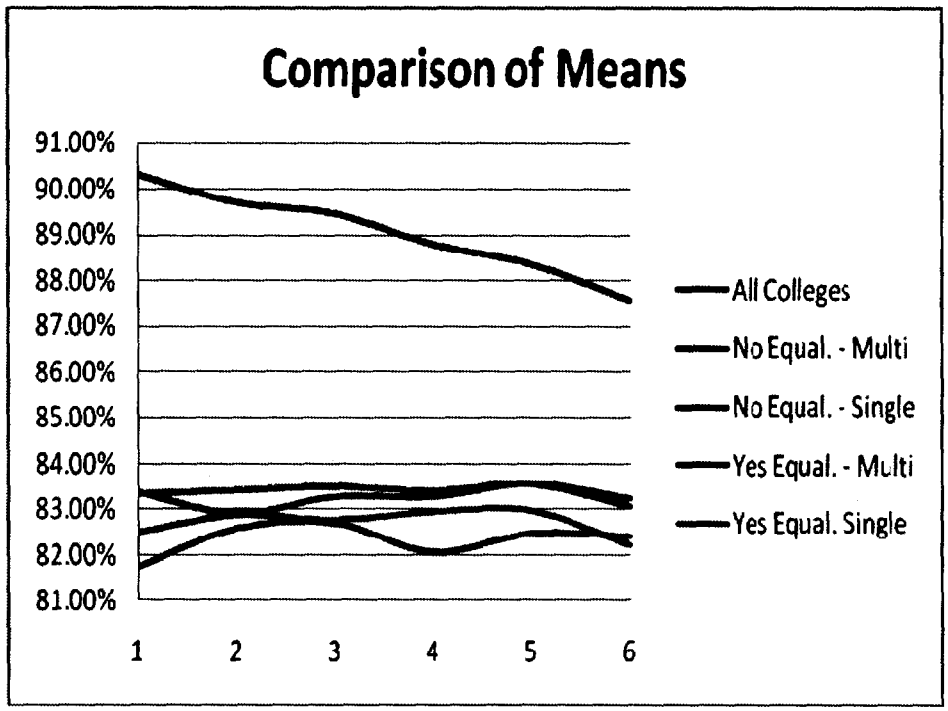

Figure 19. Comparisons for course retention means, maximums, and minimums divided into four subgroups and compared to all colleges.

The highest mean for the non-funded colleges was in Year 1 (2002-2003) at a level of 90.63% for single-campus district colleges and the lowest was in Year 1 (2002-2003) for multi-campus district colleges with 81.75%. For funded colleges, the highest level was in Year 5 (2006-2007) with 83.56% for single-campus district colleges. Conversely, the lowest mean for funded colleges was for multi-campus district colleges in Year 6 (2007-2008) with 82.21%.

Table 8
Descriptive Statistics for Course Retention: Four Subgroups

	N	Mean	Std. Dev.	Max	Min
Year 1 - 2002-2003					
Multi-Campus Districts Not Receiving Equalization Funding	18	81.75%	6.64%	90.93%	59.34%
Single-Campus Districts Not Receiving Equalization Funding	9	90.32%	3.14%	96.42%	85.82%
Multi-Campus Districts Receiving Equalization Funding	43	82.50%	3.41%	91.19%	77.61%
Single-Campus Districts Receiving Equalization Funding	37	83.37%	3.72%	90.63%	77.20%
Year 2 - 2003-2004					
Multi- Campus Districts Not Receiving Equalization Funding	18	82.59%	4.17%	91.26%	75.26%
Single-Campus Districts Not Receiving Equalization Funding	9	89.72%	5.88%	99.99%	81.39%
Multi-Campus Districts Receiving Equalization Funding	43	82.88%	3.52%	92.01%	70.98%
Single-Campus Districts Receiving Equalization Funding	37	82.90%	3.47%	90.98%	77.16%

Year 3 - 2003-2004

Multi- Campus Districts Not Receiving Equalization Funding	18	82.71%	5.92%	90.26%	64.28%
Single-Campus Districts Not Receiving Equalization Funding	9	89.47%	4.76%	95.60%	81.52%
Multi-Campus Districts Receiving Equalization Funding	43	82.77%	3.84%	91.69%	71.86%
Single-Campus Districts Receiving Equalization Funding	37	83.27%	4.37%	93.19%	73.89%

Year 4 - 2005-2006

Multi- Campus Districts Not Receiving Equalization Funding	18	82.07%	6.01%	89.51%	63.37%
Single-Campus Districts Not Receiving Equalization Funding	9	88.80 %	4.82%	96.47%	80.74%
Multi-Campus Districts Receiving Equalization Funding	43	82.95%	4.07%	91.79%	70.08%
Single-Campus Districts Receiving Equalization Funding	37	83.27%	4.45%	93.43%	72.01%

Year 5 - 2006-2007

Multi- Campus Districts Not Receiving Equalization Funding	18	82.48%	4.97%	89.81%	69.45%
Single-Campus Districts Not Receiving Equalization Funding	9	88.37%	5.74%	96.89%	81.07%
Multi-Campus Districts Receiving Equalization Funding	43	82.98%	3.82%	90.28%	70.48%
Single-Campus Districts Receiving Equalization Funding	37	83.56%	4.44%	93.79%	71.29%

Year 6 - 2007-2008

Multi-Campus Districts Not Receiving Equalization Funding	18	82.41%	4.51%	86.20%	69.13%
Single-Campus Districts Not Receiving Equalization Funding	9	87.58 %	5.03 %	97.01%	81.73%
Multi-Campus Districts Receiving Equalization Funding	43	82.21%	4.08%	90.68%	70.02%
Single-Campus Districts Receiving Equalization Funding	37	83.23%	4.08%	93.61%	72.79%

As with student course success, calculations were compared for the Los Angeles Community College District against other non-funded, multi-campus districts. Again, the Los Angeles Community College District's retention graphs had some unique

characteristics and shapes. As such, the following section extracted the 10 colleges/centers in the Los Angeles district from the non-funded colleges and additional comparisons were made.

Comparison of Sub-Populations with Los Angeles District Colleges Extracted

In an effort to look at non-funded and funded colleges in closer detail, a comparison was first made of these two subgroups means. With $n = 18$ for non-funded, multi-campus colleges, $n = 9$ for non-funded, single-campus district colleges, $n = 43$ for funded, multi-campus district colleges, and $n = 37$ for funded, single-campus district colleges, comparisons were made.

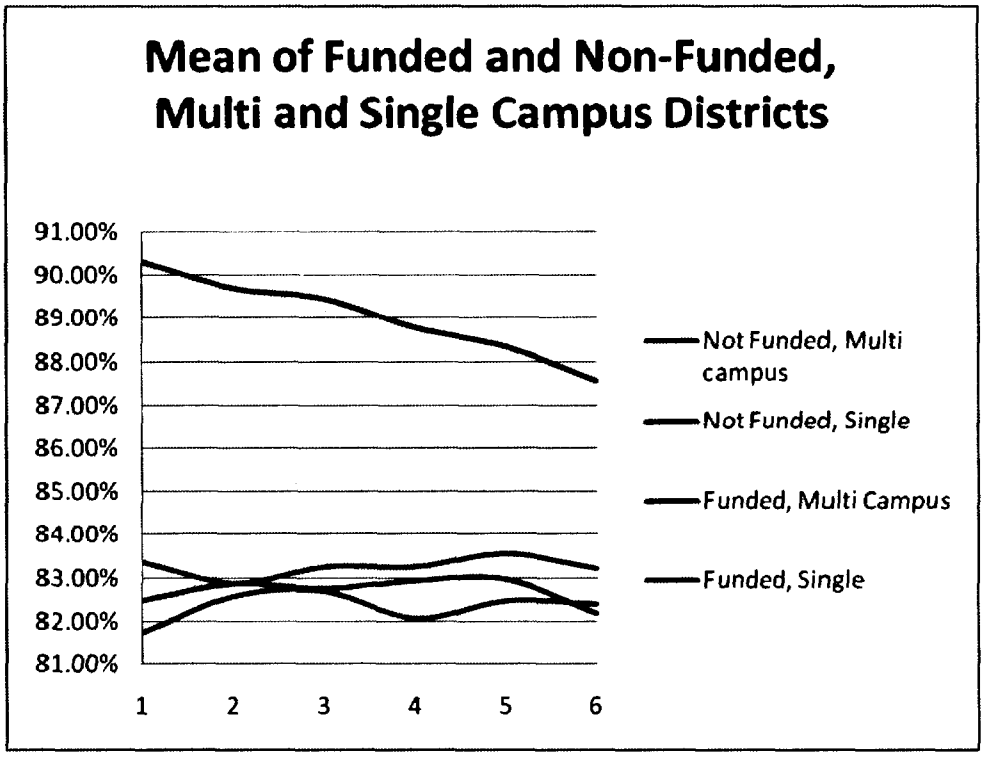

Figure 20. Course retention means of funded and non-funded colleges.

As noted above, however, 10 of the colleges/centers in the non-funded population belonged to the Los Angeles Community College District. Given that many of the colleges/centers in this district had similarly shaped lines (Appendix D), a decision was made to pull out those colleges and then compare the four subgroups of non-funded and funded colleges, and within those groups, multi and single-campus colleges. To look at the effect of pulling out Los Angeles community colleges, graphs were created showing the mean retention rates for the years studied for the Los Angeles community colleges and other non-funded, multi-campus district colleges. The means of the five sub-populations are shown in Figure 21 funded and non-funded, multi and single-campus, with Los Angeles being the fifth.

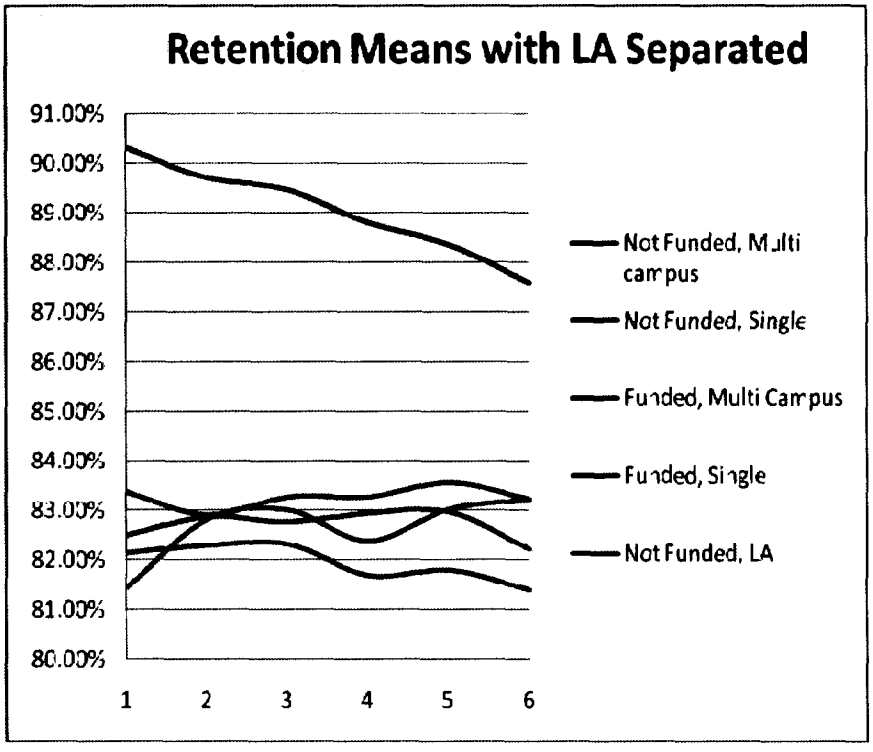

Figure 21. Success means with Los Angeles district colleges extracted.

In an effort to take a closer look at the retention means of non-funded, multi-campus, district colleges, the following graph was created to look at the variation between Los Angeles community district colleges and other non-funded, multi-campus district colleges (Figure 22). Like success rates, Los Angeles community colleges again pulled down the overall mean of retention rates for the non-funded, multi-district campus population. All Los Angeles colleges had similar retention rates over the six years of the study, with the exception of Los Angeles ITV.

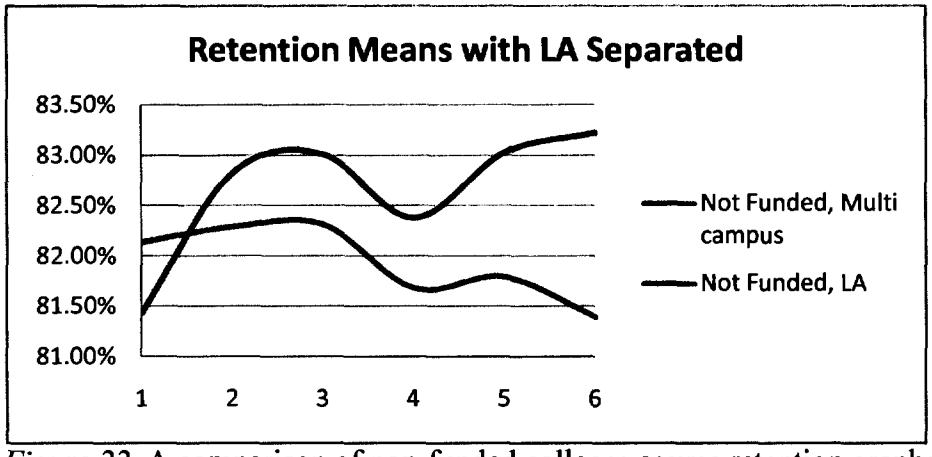

Figure 22. A comparison of non-funded colleges course retention graphs, with Los Angeles colleges extracted.

To further identify the numbers that make up these two means the two graphs in Figure 23 were completed. It is interesting to note that all of the Los Angeles Colleges have similar retention rates over the six years of the study with the exception of Los Angeles ITV.

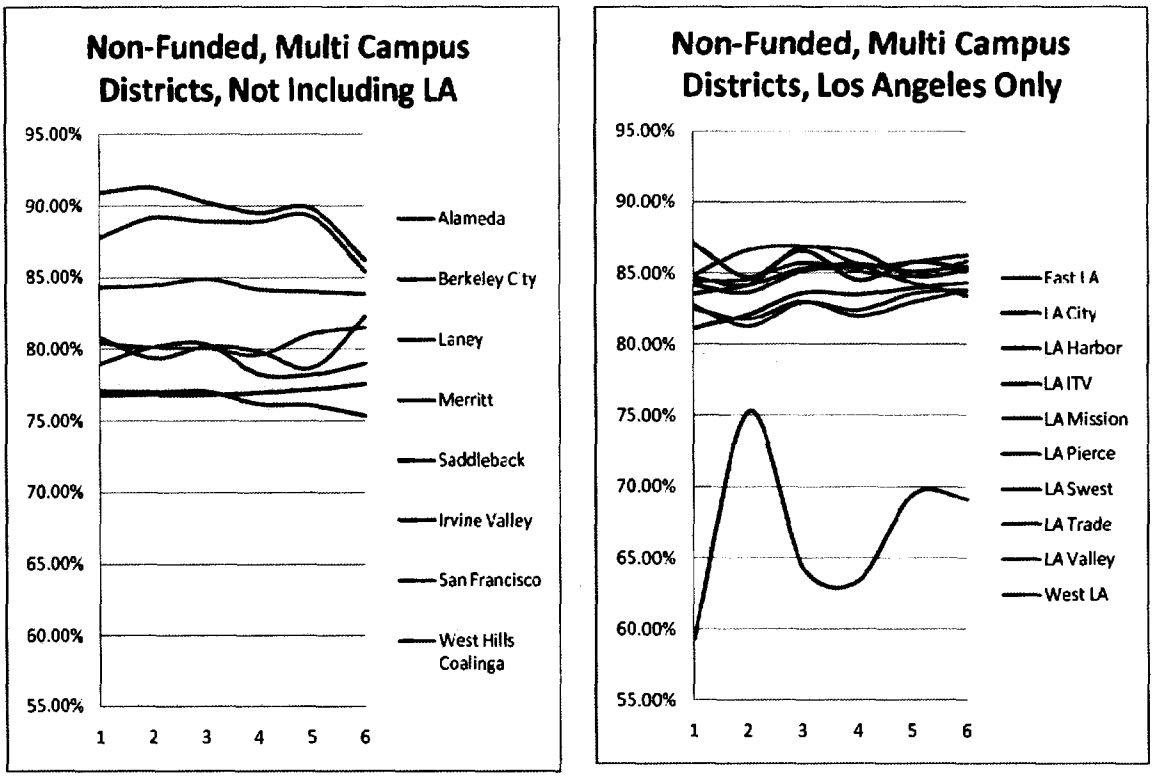

Figure 23. A comparison of non-funded colleges course retention graphs, with Los Angeles colleges extracted.

A new comparison of histograms was done to compare this new set of sub-populations. In terms of non-funded , multi-campus district colleges, none had negative slopes. The Los Angeles district colleges had a higher percentage of positive slopes (7 of the 10) compared to 3 of the 8 for non-funded, multi-campus district colleges that were not part of the Los Angeles Community College District. Only 3 of the 10 Los Angeles colleges had a flat slope as compared to 5 of 8 of the non-funded, multi-campus colleges not in that district.

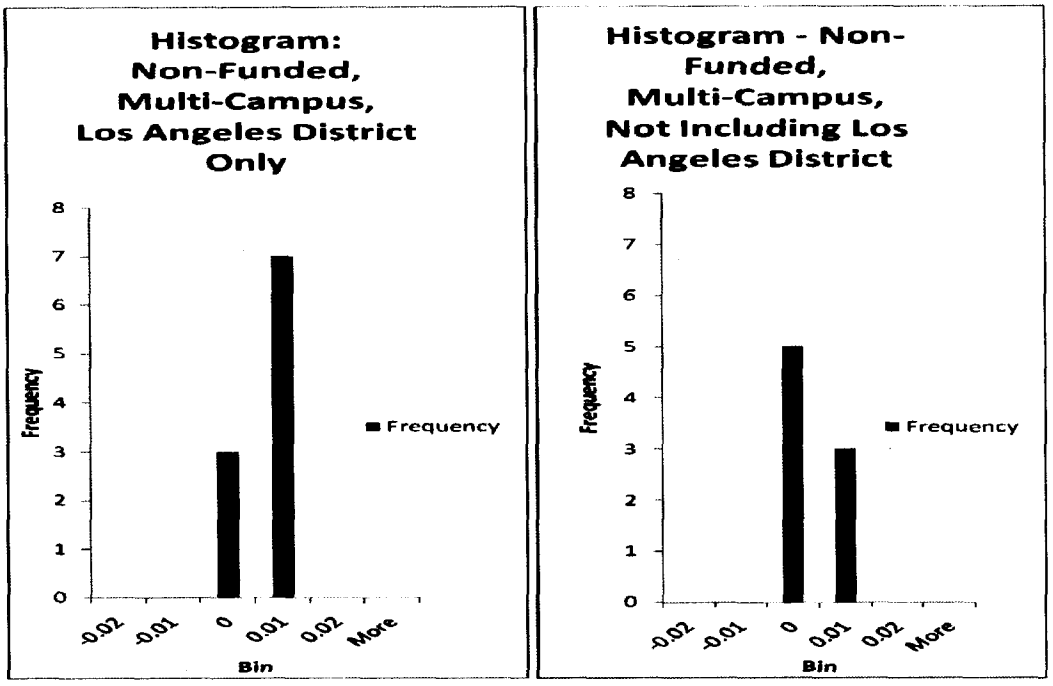

Figure 24. A histogram for retention slopes of non-funded, multi-campus district colleges compared with a histogram of Los Angeles district colleges retention slopes.

By looking at each of the individual graphs of the colleges, it was determined that Los Angeles community colleges had several unique patterns in both success and retention. It was only through this individual plotting that these were realized. Thus, a graph for each college that showed both course success and course retention was developed to determine if there were any similarities between the colleges.

Course Retention Means for Basic Aid Districts and Other Non-Funded Colleges

As discussed previously the Basic Aid Districts in California receive so much in local property tax revenue, there is no need for a state contribution to makeup the deficit between the FTES allocation, once the student tuition and local property tax funds are received.

To see if there was a difference without these Basic Aid Districts included, a new course retention mean graph was completed. It showed that Basic Aid Districts had

higher course retention means throughout the study. In Year 6, however, these percentages became very close (Figure 25).

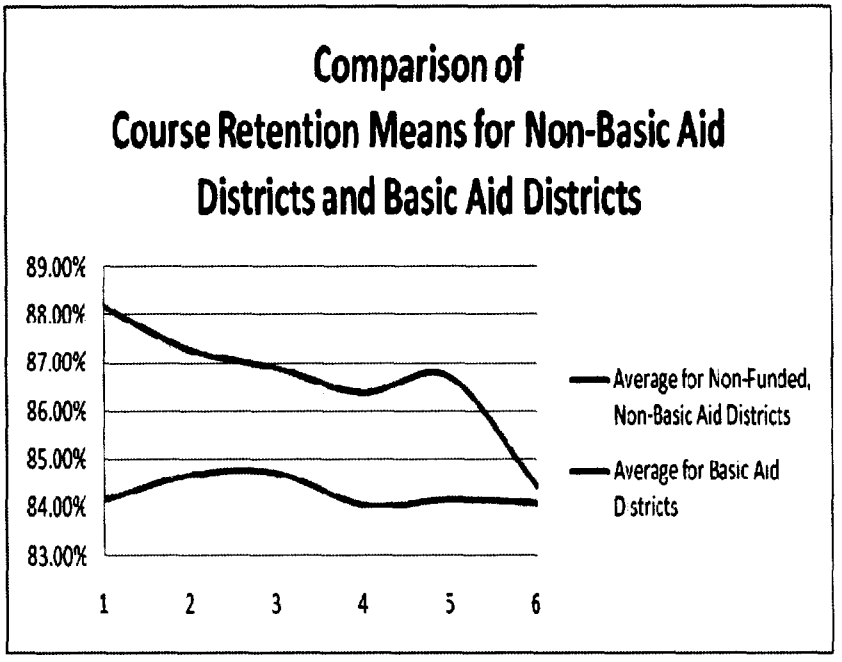

Figure 25. Comparison of course retention means for Non-Basic Aid Districts and Basic Aid Districts.

Because of the differences with the Los Angeles Community College District as noted above, the next calculations extracted both the Basic Aid Districts and the Los Angeles district colleges and compared those to other non-funded colleges. The Los Angeles districts colleges had a lower course retention rate for each of the six-years studies. In addition, the following graph in Figure 26 shows that the gap between Basic Aid Districts and non-Basic Aid Districts (not including Los Angeles) was less when Los Angeles was extracted from the mix.

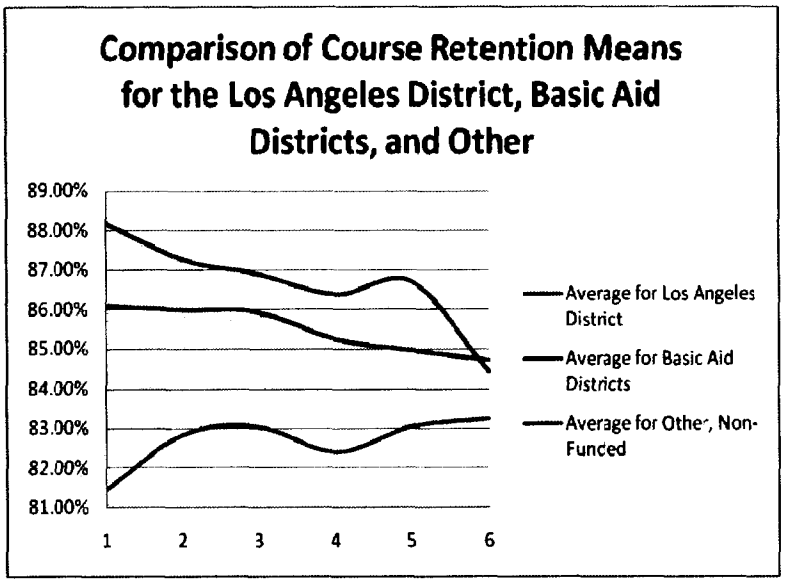

Figure 26. Comparison of course retention means for the Los Angeles District, Basic Aid districts, and others.

When comparing this graph to the success means of the funded colleges, the non-funded colleges of Basic Aid and Other still have a higher success mean than the funded colleges. Once again, it showed that the Los Angeles Community College District is large enough to pull down the success rate means of non-funded colleges. It was interesting to note that while Basic Aid Districts had a higher success rate for Years 2-5 of the study, in Year 6, those figures were very comparable. Conversely, the success means of non-funded, colleges that did not include either Basic Aid Districts or Los Angeles colleges remained greater throughout the study (Figure 27).

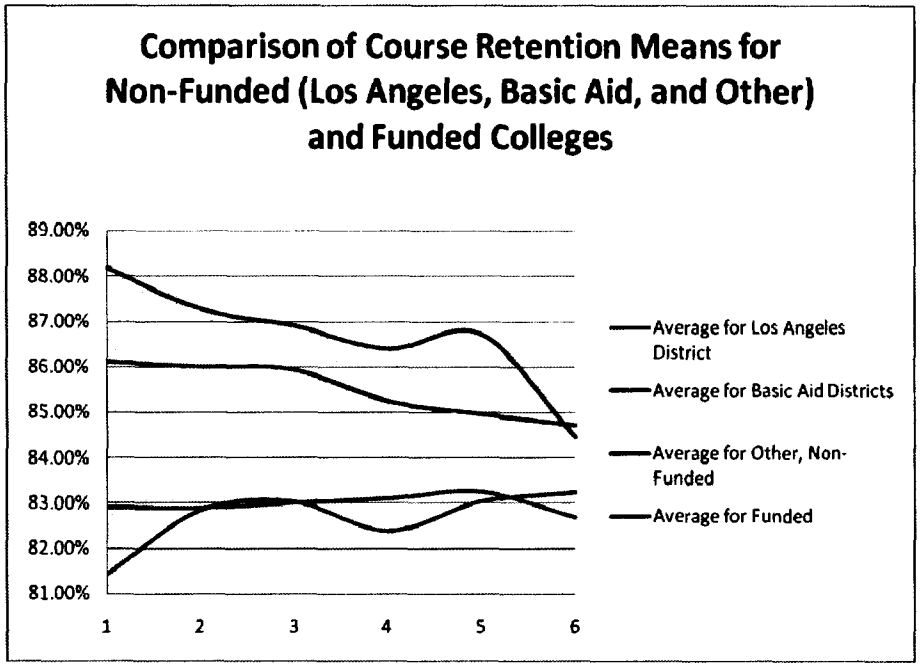

Figure 27. Comparison of course retention means for non-funded (Los Angeles, Basic Aid, and Other) and funded colleges.

Combined Graphs

Many of the colleges' graphs that have been smoothed out show similar shapes for both success and retention. In an effort to compare this more in depth, this section of the study focused on which graphs looked the same not only on a college-by-college basis, but also on an intra-district basis if the college was part of a multi-campus district. Appendix G shows all of the graphs by district level.

At the district level twenty-five single-campus districts with colleges that had close to the same pattern for both success and retention. Four of the twenty-five were non-funded, while 21 were funded. Those non-funded, single-campus district colleges included: Barstow, Long Beach, Mendocino, and Siskiyous. The funded, single-campus disctrict colleges included: Allan Hancock, AVC, Butte, Cabrillo, Cerritos,Chaffey, Copper Mountain, Desert, Gavilan, Glendale, Hartnell, Imperial, Monterey, Mt San Antonio, Mt. San Jacinto, Palomar, Pasadena, Redwood, San Luis Obispo, Santa Monica, and Sonoma.

For the funded, multi-campus, district colleges, the Contra Costa district had all three colleges with the same shapes of retention and success. Other districts belonging to the population of funded, multi-campus, district colleges whose graphs had similar success and retention plot lines included: El Camino, Grossmont-Cuyamaca, Los Rios, North Orange, San Francisco, San Jose, and State Center.

Some colleges did not have similar patterns for success and retention. For the non-funded, single-campus district colleges, there were three: Lassen, Ohlone, and Palo Verde. For the funded, single-campus district colleges, there were fourteen: Chaffey,

Feather River, Lake Tahoe, Napa, San Joaquin Delta, Santa Barbara, Canyons; sequoias, Shasta-Tehama-Trinity, Sierra, Southwestern, Victor Valley, West Kern, and Yuba.

For the funded, multi-campus district colleges, there were several variations of graphs. In the Chabot-Los Positas District, both colleges had differently shaped graphs for both success and retention. And, in the Coast District, two of the three colleges had similar patters within the individual college graphs for success and retention. In addition, these two colleges (Coastline and Golden West) had similarly shaped graphs when compared to each other. One of the colleges (Orange Coast) in this district had a differently shaped retention and success lines. For the Foothill-Deanza District, Foothill College had similarly shaped success and retention lines, but Deanza did not.

Six funded, multi-campus districts had differently shaped graphs for all of the colleges within their district, both when comparing each individual college's success and retention graphs and those graphs against others in the district. Those districts were: Kern, San Bernardino, San Diego, San Mateo, Ventura, West Valley-Mission, and Yosemite. The same is true for three non-funded, multi-campus districts (Peralta, Rancho Santiago, and West Hills) that did not have similar patterns either within the individual college's graphs or when comparing colleges within the district.

As mentioned in other portions of this dissertation, the Los Angeles Community College District, the largest in the State, had colleges with uniquely shaped success and retention lines. In addition, while many of the colleges in this district had similarly shaped success lines, they were not similar on an individual college level to the shape of the respective institution's retention lines.

Summary

To review, of the 107 California community colleges (or centers) that were studied for this project, change-over-time was studied for course success and course retention for a six year time periods (2002-03, 2003-04, 2004-05, 2005-06, 2006-07, 2007-08).

Both of course success and course retention were evaluated using the same methods. First, individual colleges' success rates were evaluated by looking at the smoothing of the empirical growth plots and categorizing with the shape of other community colleges within the California community college system. Second, the total population was divided into colleges that received equalization funding and those colleges that did not receive equalization funding. These subgroups had slope and R^2 ranges evaluated, and in an effort to see individual slopes in a graphical reference, each of the college success/retention rates was used to fit trajectories onto superimposed empirical growth plots. Third, histograms were created to show the frequency of slopes for both of the subgroups—non-funded colleges and equalization-funded colleges. Next, plots were completed to show all 27 colleges that did not get equalization funding and the 80 colleges that did receive such funding. This same information provided a basis for descriptive statistics regarding means, maximums, and minimums.

The last part of each section looked at four subgroups (non-funded and funded colleges and multi-campus and single-campus districts) and for the subgroups average slopes, frequency of slopes, and means were evaluated.

Finally, this chapter evaluated each of the college's success and retention graph against each other. In addition, these graphs were segmented into their respective community college district, and showed change-over-time for both success and retention for each of the colleges studied. By looking for similarities between success and retention for the six years of the study, patterns within the district, and with the specific college evaluated.

CHAPTER 5: SUMMARY, DISCUSSION AND RECOMMENDATIONS

Overview

California community colleges have a long history of disparate funding per Full Time Equivalent Student (FTES). In 2004-2005, funds were included in California's state budget to bring all of the State's public community colleges to the 90th percentile of the highest funded FTES allocation within three years (Carroll, 2006). As part of the lobbying done by these underfunded colleges, there was a perception that student success and student course retention could have an association with funding levels. The thought was that if lower funded community colleges received additional funding, more student support services could be offered to better compete with the higher funded community colleges in the State. As was portrayed in the vignette in Chapter 1, many times these lower funded colleges were adjacent to the higher funded colleges and there becomes many issues of services, public relations/marketing budgets, and overall competition.

A review of the literature revealed that limited research was available regarding the exact topic of funding levels and the association with student course success and course retention. The landmark case of *Serrano v. Priest*, however, provided a basis for this study. In 1971, that case was decided in the California State Supreme Court, and it was found the California school financing system was unconstitutional under the equal protection provision of the state constitution (Dowd, & Grant, 2005). The court said that educational resources provided to students depended on the wealth of the neighborhoods in which they lived, and that this was a fundamentally unjust arrangement. Because community colleges in the State were born from the same structure as K-12 institutions, similar conclusions can be drawn from the tradition of local control and local financing.

The main goal of the study was to gain an understanding of the association between equalization funding and student course success and student course retention. To achieve this goal, I examined student success, student course retention, and equalization funding data from 107 community colleges. A descriptive research design was used for this study, and the archival data was made available through the California Community College Chancellor's Office.

After studying the association between equalization funding and student course success and student course retention, I use this final chapter to apply the statistics to the research questions, as well as reflect on the implications for practioners and future researchers. First, I discuss the questions as they relate to student course success and then move to the questions relating to student course retention. I then discuss some additional findings regarding success and retention which were discovered through this study. I will conclude by examining implications of the findings and recommendations for further study.

Discussion of the Findings

Course Success: Change-Over-Time for Individual Colleges

Research Question 1 asked, "By looking at the empirical growth plots for each college, how did the success scores of each college change over time?" Individual colleges' success rates were reviewed by looking at the smoothing of the empirical growth plots and categorizing colleges by the shapes of the success lines. This process was valuable in many ways. It was at this point of the study that it was determined that some colleges in multi-campus districts had the same shaped success lines. A good

example of this was the colleges in the Los Angeles Community College District. From this process it became clear that it was important to look at the data for non-funded colleges separate from colleges in the Los Angles Community College District, as all of the colleges in that district had uniquely shaped success mean graphs.

Course Success: Slope Comparison of Non-Funded and Funded Colleges

Research Question 2 asked, "After dividing the total population of all colleges into two groups (non-funded and funded), and superimposing fitted trajectories on to each of the college's empirical growth plots, what were the slopes and R^2 ranges for the success graphs of each college? How did the two sub-populations (funded and non-funded) compare to the overall average?"

The findings showed that the two sub-populations of non-funded ($n = 27$) and funded colleges ($n = 80$) had an aggregate average slope of -0.00457 for the six-year period. For non-funded colleges, the slope was -0.00987, and the average slope for colleges that received equalization funding was -0.00278. In looking at these numbers, a couple of things became clear. First, the non-funded colleges had nearly double the negative slope of the entire population's average when looking at only the two subpopulations. It could be argued that the slope differential between these two groups was not meaningful, because there was not much variance between -0.987% to -0.278%. In an environment where incremental change in course success was difficult to effect, I believe there were some positive implications.

Second, by looking at the slopes of each of the colleges again Los Angles Community College District colleges stood out with larger slopes than those of other

colleges. Again, because of the uniquely shaped lines colleges in this district to appear to have more negative slopes than that of their non Los Angles district colleges counterparts.

Course Success: Frequency for Non-Funded and Funded Colleges

Research Question 3 addressed the frequency of success slopes for the non-funded and funded subgroups. It asked, "What was the frequency of success slopes for both subgroups (non-funded and funded)? How did the individual plots compare to the overall sub-populations for student course success? What were the success means, maximums, and minimums for each of the sub-populations, and how did they compare to the other sub-populations?"

Trajectories were superimposed on empirical growth plots for student success. For non-funded-equalization colleges, the R^2 ranged from a low of .0348 to a high of .8824. The slope of the fitted trajectories ranged from a minimum of -0.2477 to .02913 (Appendix B). The histograms for the two subgroups showed that:

1. Fourteen of the 27 slopes for the non-funded colleges had a negative slope,
2. Seven of the 80 of the funded colleges had a negative slope.
3. Four of the 27 non-funded colleges had a positive slope
4. Twenty of the 80 funded colleges had a positive slope.
5. Of those having flat slope, 9 of the 27 non-funded colleges was compared to 53 of the 80 funded colleges.

Overall, non-funded colleges had 48.15% flat or positive slopes while their funded counterparts had 91.25%. Because the funded counterparts had nearly double the percentage flat or positive slope lines, one could argue that additional funding to those college helped insulate declining success throughout the State. In and environment where student success rates were on a decline, more colleges which received funding had flat or positive slopes when compared to their non-funded counterparts.

It is also important to look at the numbers which comprise the 48.15% for non-funded colleges. Of that 48.15%, 14.81% accounted for the positive slopes and 33.34% accounted for the flat slopes. For the funded colleges, 91.25% was comprised of 25.00% colleges with positive slopes and 66.25% flat slopes. Again by looking at this portion of the calculations, funded colleges were close to double for each of the categories of flat and positive slopes. From the difference in these two groups slope lines, the study seems to show that there could be an association between increased funding and student course success.

The highest student success mean for non-funded colleges was 70.78% and the lowest mean was 66.54%. For funded colleges, the highest mean was 67.42%, and the lowest mean was 65.77%. The greatest difference was 3.80% in Year 2 and the smallest was .71% in Year 4. In short, there was a smaller standard deviation in funded colleges, and funded colleges were closer to their funded success means than those of their non-funded counterparts. Again, showing that there could be some association between additional funding and student success.

In looking at only these two subgroups, it appeared that there was a much larger difference in mean success in the early years of the study—up to 3.8% in Year 2. That difference, however, in Year 3 became much closer. By the end of the study, the mean lines for non-funded and funded colleges were almost equal. This data showed that while the means were close, at least at the end of the study, there was a greater difference with maximums on success lines means for non-funded and funded colleges. In addition, it was interesting to note that the minimum mean lines for non-funded colleges, had the same unique shape of many of the colleges in the Los Angeles community college district. In all, when comparing the subgroups' means on this level, it appeared that there was a noteworthy difference in non-funded and funded colleges. The large differential of success means at the beginning of the study (before equalization funding was started) became markedly closer by the end of the study period. And while the overall success of California Community Colleges students decreased over time, there was less decrease at funded colleges.

Course Success: Frequency of Slopes for Non-Funded and Funded Colleges, Further Divided By Multi-Campus and Single-Campus Districts

Research Question 4 asked, "After further dividing the two sub-populations (non-funded and funded) into four sub-populations (multi-campus and single-campus districts), what was the frequency of success slopes for all four of the subgroups? How did the individual plots compare to the overall sub-populations for student course success? What were the success means, maximums, and minimums for each of the sub-populations, and how did they compare to the other sub-populations?"

The following was established:

1. Eleven of the 18 non-funded , multi-campus district colleges had negative slopes, as compared to two of the 43, funded, multi-campus district colleges.
2. One of the 18 of the non-funded, multi-campus district colleges had a positive slope, while 10 of the 43 funded, multi-campus district colleges had a positive slope.
3. Six of the 18 non-funded, multi-campus district college had a flat slope, while 31 of the 43 funded, multi-campus district colleges had the same slope.

This data provided further information on the sub-populations as they were associated with student course success. When multi-campus district colleges were evaluated, the non-funded colleges had over 13 times the percentage of negative slopes than those of the funded colleges. For example, non-funded, multi-college districts showed 61.11% colleges with a negative slope while only 4.65% of the slopes were negative for funded colleges. Conversely, funded colleges had just over four times the number of positive slopes when looking at percentages of the whole, with funded colleges having 23.26% positive slopes and non-funded colleges having 5.56% positive slopes. Lastly, funded, multi-campus colleges have nearly double the percent of flat slopes (72.09%) as compared to non-funded campuses (33.33%). Overall, when looking at the current segregation of multi-campus district colleges, funded colleges seem to have more flat or positive sloped success lines than those of their non-funded counterparts. Again, this finding was in alignment with the above findings of funded versus non-

funded colleges. It appeared that there might have been some association with equalization funding and its association, albeit slight, with student success.

For single-campus districts, the results were similar. They included:

1. Three of 9 non-funded, single-campus district colleges had negative, while 5 of 37 funded, single-campus district colleges were negative.
2. Three of 9 non-funded, single-campus district colleges had positive, while 10 of 37 were positive for funded, single-campus colleges.
3. Three of 9 non-funded, single-campus district colleges had a flat slope, while 22 of 37 funded, single-campus colleges had flat slopes.

Again, on a percentage basis, there were over double the percentage of negative slopes with non-funded, single-campus colleges (33.33%) than that of their funded counterparts (13.51%). Interestingly, the non-funded, single-campus colleges were split equally between negative slopes, positive slopes, and flat slopes, while funded, single-campus colleges have a greater percentage of flat slopes (59.46%) and positive slopes (27.03%), than negative slopes (13.51%). As such, while 66.66% of the non-funded, single campus districts had flat or positive slope, 86.49% of funded, single campus districts had flat or positive sloped lines. Like the above findings for other segments of the population, single-campus district colleges also show an association between equalization funding and student success.

Course Retention: Change-Over-Time for Individual Colleges

Research Question 5 asked, "By looking at the empirical growth plots for each college, how have colleges' course retention scores changed over time?" The smoothing

of the empirical growth plots showed that most of the colleges' course retention graphs had straight course retention graphs. As was done with success, individual colleges' retention rates were reviewed by looking at the smoothing of the empirical growth plots and categorizing colleges by the shapes of the retention lines. This process for retention was not as valuable as it was for success. While the success process pointed out uniquely-shaped lines, there were no notable findings for retention.

Course Retention: Slope Comparison of Non-Funded and Funded Colleges

Research Question 6 asked, "After dividing the overall population of all colleges into two groups (non-funded and funded), and superimposing fitted trajectories on to colleges empirical growth plots, what were the slopes and R^2 ranges for each of the colleges retention graphs? How did the two sub-populations (funded and non-funded) compare to the overall retention average?"

After looking at the slopes and change-over-time by sub-populations, it was determined that the average slope for all colleges over the six-year time period was -0.003. The average slope for non-funded colleges was -0.0013, while the average slope for funded colleges was 0.0000. While there was a difference, it was not considered meaningful because all of the numbers were so close.

Course Retention: Frequency of Slopes for Non-Funded and Funded Colleges

Research Question 7 addressed, "What was the frequency of retention slopes for both subgroups (non-funded and funded)? How did the individual plots compare to the overall sub-populations for student course success?" The histograms for the two subgroups showed that:

1. Three of the 27 slopes for the non-funded colleges had a negative slope.
2. Two of the 80 of the funded colleges had a negative slope.
3. 13 of the 27 non-funded colleges had a positive slope.
4. 39 of the 80 funded colleges had a positive slope.
5. Eleven of the 27 non-funded colleges had a flat slope.
6. 39 of the 80 funded colleges had flat a slope.

Again, when looking at this retention histogram data, it was determined that the slopes for non-funded and funded colleges were very similar. While this allowed comparison of the overall mean, the percentage of either flat slopes or positive slopes for non-funded and funded colleges was 88.89% and 92.50%, respectively. While the non-funded colleges had a higher positive slope percentage (48.15%), the funded colleges had a higher percentage of flat slopes. In addition, the reason that the non-funded colleges received a slightly lower mean for course retention was that a higher percentage of the colleges in this category had negative slopes—11.11% of the of the non-funded colleges as compared to 2.5% for the funded colleges. On the whole, however, both non-funded and funded colleges had the same percentage of positive slopes, and nearly the same number of flat slopes. These data lead to show that there is not an association between student course retention and equalization funding.

The highest course retention mean for the non-funded colleges was 84.97% and the lowest mean was 84.14%. For funded colleges, the highest level was 83.25% and the lowest was 82.68%. Again, there does not seem to be a meaningful association between

student course retention and equalization funding as the difference between the two is minimal.

Course Retention: Frequency of Slopes for Non-Funded and Funded Colleges, Further Divided By Multi-Campus and Single-Campus Districts

Research Question 8 asked, "What were the retention means, maximums, and minimums for each of the sub-populations, and how did they compare to the other sub-population? After dividing the two populations into four populations (multi-campus and single-campus districts), what was the frequency of course retention slopes for all four subgroups?"

The following findings were discovered for multi-campus districts:

1. None of the 18 non-funded, multi-campus district colleges had negative slopes, while 1 of the 43 of the funded, multi-campus district colleges had a negative slope.
2. Ten of the 18 non-funded, multi-campus district colleges had a positive slope, while 23 of the 43 of the funded, multi-campus district colleges had a positive slope.
3. Eight of the 18 non-funded, multi-campus district colleges had a flat slope, while 19 of the 43 funded, multi-campus district colleges had a flat slope.

Even when broken down into further sub-groups, the results were nearly identical for multi-campus districts' frequency of course retention slopes for non-funded and funded colleges. While the non-funded multi-campus colleges had 44.44% of the colleges with a flat retention slope, the funded multi-campus colleges had 44.19% of its total

population with flat retention slopes. In terms of positive slopes, again, the non-funded and funded colleges were similar with 55.56% and 55.49%, respectively. For frequency of negative slopes, again the percentages were nearly identical with 0.00% for non-funded, multi-campus colleges and 2.33% for funded, multi-campus colleges. Because the frequency of slopes were nearly identical for multi-campus district colleges, it was determined that there was not an association between student course retention and equalization funding.

The retention slope results for single-campus districts, however, were a bit different. Those results included:

1. Three of the 9 non-funded, single-campus district colleges, had a negative retention success slope, as compared to 1 of the 37 for funded, single-campus district colleges.
2. Three of the 9 non-funded, single-campus district colleges had a positive slope, while 16 of 37 funded, single -campus district colleges had a positive slope.
3. Three of the 9 non-funded, single-campus district colleges had a flat slope, while 20 of the 37 funded, single-campus district colleges had a flat slope.

For the single-campus district colleges, frequency of course retention slopes for non-funded colleges had more negative and flat slopes than that of their funded counterparts. While the non-funded single-campus colleges had 33.33% of the colleges with a negative retention slope, the funded multi-campus colleges only had 2.70% of its total population with negative retention slopes. In terms of positive slopes, again, the non-funded colleges

had 33.33% positive slopes while 43.24% of the funded colleges had positive slopes. For flat slopes, again 33.33% of the non-funded, single campus districts had flat slopes, and 54.05% of the funded, single-campus districts had flat slope. It is interesting to note that the non-funded, single campus districts had an even frequency of negative, flat, and positive slope lines for the period studied—and that the distribution of negative, positive, and flat slopes was the same for both course retention and course success.

When looking at this segment of single campus districts, it could be said that that equalization funding does have some association to student course retention in single campus district colleges. There were 66.66% of non-funded, single campus district colleges that had a flat or positive slope as compared to 97.30% of funded, single campus district colleges.

Additional findings for Success and Retention

There were five findings which were not originally defined in the research questions. As the study progressed and the change-over-time graphs were studied, however, there were additional findings. First, as has been mentioned, the Los Angeles Community College District, which is a non-funded, multi-campus district, had some characteristics unique enough as to necessitate that its district's colleges success rates be evaluated separately. When the Los Angeles colleges/centers were excluded from the non-funded sub-population, there was a meaningful difference compared to only using the four subgroups. No longer did the means of the non-funded and funded colleges get markedly closer together. While Los Angeles Community colleges had higher success

rates early in the study, the low success rates later in the study were significant enough to pull down the slopes and means of the non-funded college subfroup. The new comparison of histograms showed 10 of the 10 in the Los Angeles Community College District had negative slopes. Conversely, only five of the 17 (29.42%) non-funded, non-Los Angeles colleges had negative success slopes.

When success rates were first evaluated, it appeared that there was a meaningful difference in course success between funded and non-funded community colleges in California. The spread of nearly four percentage points was considered consequential. While this spread certainly was accurate, when drilling down to another level of sub-populations, other results were identified. Overall, non-funded, single-campus colleges had the overall highest mean scores by over four percentage points. Even after funding was applied, the single-campus and the multi-campus districts success means got much closer in terms of percentage means. When Los Angeles Community Colleges were extracted, the funded and non-funded colleges again maintained about the same percentage point split, but the overall mean success line for Los Angeles fluctuated both above and below both the means for funded and non-funded multi-campus colleges.

Second, another finding which was not identified in the research questions, was that of comparing California's Basic Aid Districts and the non-Basic Aid Districts. As a reminder, Basic Aid District in California receive so much in local property tax revenue, there is no need for a state contribution to makeup the deficit between the FTES revenue cap and the student tuition and local property tax funds. There were three Basic Aid Districts in California: Marin, Mira Costa, and South Orange. As has been noted

previously, Marin was not used for this study, as there was not complete data available. The other two districts comprise the colleges of Mira Costa (Mira Costa), Irvine (South Orange), and Saddleback (South Orange).

To see if there was a difference with these Basic Aid Districts included, these colleges were extracted from the non-funded college sub-population. The new calculations showed that Basic Aid Districts had a lower student success mean in Year 1 and Year 2 of the study, although for Years 3-5 these colleges had higher success rates. In Year 6, the mean success rate of Basic Aid Districts was very comparable to other non-funded colleges.

Third, by extracting both the Basic Aid Districts and Los Angeles District colleges from the other non-funded colleges, additional findings were garnered. When looking at the mean averages for all non-funded colleges but by breaking them into three subgroups (Basic Aid, Los Angeles District, and Other) the results were intriguing. The colleges which were considered "other" and neither Basic Aid Districts nor Los Angeles Community College District colleges have the highest mean averages for Year 1 and 3-6. The only year that Los Angles District colleges received a higher success mean was in Year 2—or the year that created a unique shaped curve for the District's colleges.

Fourth, when comparing the means of the four sub-populations, the non-funded , single-campus had the highest means for retention the period studied. Conversely, although not by much, equalization-funded, multi-campus colleges received the lowest mean scores for the period studied.

When course retention was evaluated in this study and Basic Aid Districts and non-funded districts were compared, it was found that Basic Aid Districts had a higher course retention mean throughout the study. In Year 6, however, these percentages became very close. In alignment with the previous concerns about Los Angeles Community College District's uniquely shaped success lines, the following evaluation extracted both the Basic Aid Districts and the Los Angeles District's colleges from the non-funded population and made comparisons. In doing so, the Los Angeles District's colleges had a lower course retention rate for each of the six years studied. Also, the gap between Basic Aid Districts and non-Basic Aid Districts' course retention means when Los Angeles District's colleges were extracted from the mix.

Fifth, in an effort to get an overall view of how college course success and course retention graphs compared on both a college and a district basis, both success and retention lines were plotted on college graphs. The college graphs were further broken down by district so as to compare both on a college-level and a district-level. There were no meaningful findings through this process except that some colleges had similarly shaped retention and success lines, and some did not. In addition, some districts had colleges which had similarly shaped lines, and some did not.

What the Story the Tell Us

One of California's attempts to level the playing field for California's community colleges and its students was that of the equalization funding plan that was put into place for the 2004-2005 academic year. The story of this dissertation has many facets. First, from an early overall view, there seemed to be a slight association between student

success and equalization funding when the total population was broken down into funded and non-funded colleges. The average slope for the total population was -.457%, while the slope for non-funded colleges was -0.987% and the slope for funded colleges was -0.278%. It is important to realize that while the slope was nearly double for non-funded colleges, it was still less than 1% difference.

Second, when comparing the success means of funded and non-funded colleges, the graphs grew closer as the study progressed. This means than as funded colleges received additional funding, the overall success means grew closer. While success declined throughout the State, it was believed that perhaps additional funds given to the funded colleges helped insulate declining success rates.

Third, when looking at the differences between multi-campus and single-campus district colleges there were additional stories. For non-funded colleges, single campus districts had equal representation in negative, flat, and positive slopes, while the multi-campus districts had double the number of negative slope success lines. The implication was that more multi-campus district colleges had declining success rates than those in the single district campus category. When looking at funded colleges the percentages in each of the categories of negative, flat and positive categories were fairly consistent, with only a bit more colleges in the flat slope category for multi-campus district colleges.

When comparing the average means of each of the college types, non-funded, single-campus colleges have the highest success rates and for more than half of the study, non-funded, multi-campus district colleges have the lowest average success means. In short, for non-funded colleges, single campus college have more success than that of their

multi-campus colleges. For funded colleges, multi-campus colleges have slightly better success than that of their single-campus district colleges.

Fourth, for course retention, the difference in slopes between funded and non-funded colleges was .13% which was not seen as meaningful. In addition when studying the frequency of slopes the results for each of the groups was nearly the same. Lastly when graphing the average success for non-funded and funded colleges, there remained a consistent spread between the two mean success lines. Given these facts, there was no meaningful difference in non-funded and funded colleges for the period during the study. In other words there was not an association found between additional funding to colleges and student course retention.

It is important to note, however, that there was a finding when comparing the means of single-campus district colleges and multi-campus district colleges. The nine non-funded, single-campus, district colleges had a meaningful difference in student course retention.

Fifth, and perhaps the punch line of this study, evolved throughout the process. Early in the study it became apparent that colleges in the Los Angeles Community College District were different from their non-funded, multi-campus counterparts. Thus, colleges in this district were extracted and separate calculations were completed. The study showed that not only was there a meaningful difference between non-funded colleges and Los Angeles colleges, and Los Angeles colleges had a lower mean success rate than the funded colleges for four years of the study. When extracting Los Angeles colleges from the non-funded population, the mean success lines of non-funded and

funded colleges no longer grew closer together but instead maintained a consistent difference over time. It was at this point of the study that it became clear that while earlier in the study it appeared that funding had an association with student success for funded colleges, this was not the case. Instead the uniquely-shaped success lines of the ten Los Angeles community colleges had enough impact on the non-funded subpopulation to pull down the mean success of the group. In addition, once the Basic Aid Districts were also extracted from the non-funded subpopulation, the mean success rose even more and again showed that there was no association between equalization funding and student course success.

Implications of Findings

We know that community colleges serve as society's vehicle for continuing education (Breneman & Nelson, 1981). And in the California State Supreme Court decision of *Serrano v. Priest* it was found that the prior California school financing system was unconstitutional under the equal protection provision of the state constitution (Dowd, & Grant, 2005). The court said that educational resources could not be dependent on the wealth of the surrounding neighborhoods. Later, Dowd & Grant reviewed national data and characterized intrastate variations in revenues from state and local sources for community colleges and analyzed differences and similarities in distribution patterns in states, with and without local-share financing, from the perspective of equity and efficiency. Their hypothesis was that local funding in community colleges created revenue disparities that disadvantaged the least affluent communities in a state.

in California, it would be hard to argue that there is much association between funding levels and student success. When pulling out those Los Angeles Community Colleges that showed uniquely shaped lines, the means scores of the groups (non-funded/funded/multi-campus/single-campus) did not get closer once equalization funding was applied. Once it was decided to look at the four sub-populations without excluding Los Angeles, there did appear to be a difference in success rates, once equalization was applied.

In accordance with the *Serrano v. Priest* decision, it would state that Basic Aid districts would have greater resources available to students and that those students would have more success in school. The findings only partially support this premise. In Years 3-6 of the study, this was the case when compared to other non-funded colleges. On an overall basis, however, this was not the case. Because funding levels (FTES allocations) would not have changed during this time period, it was hard to believe that there was any association with student success, student retention and funding levels as identified by this study.

To look at a more global view, however, one needs to look at the diminishing success rates of non-funded colleges. While success rates dropped throughout the State for the period studied, those colleges that received funding dropped less than those colleges that did not receive funding. In other words, a future study might ask the question, "In an environment of state-wide declines in student success, did equalization funding help insulate certain colleges from lowered success rates?"

Just as this study focused on course success rates, I believe it was also important to look at course retention rates and their association with funding levels. Realizing that many of the same strategies which promote student course success, also help retention, I believed these two topics went hand-in-hand. In reviewing the data outcomes, however, similarities were not found in the results.

Recommendations for Further Study

Three suggestions for future research were found in this study. First, it would useful to have this study serve as the foundation and continue with this change-over-time study. Such study could determine if the new funding mechanism of SB361 which provided for equalized FTES funding provided for any changes in percentages, means, standard deviations, frequency distributions, central tendency, and variability. Because funding changes do not always have an immediate impact, it would be interesting to see if there were any long-term changes in equalization funding and its association with student course success or course retention.

Second, a qualitative study on the Los Angeles Community College district could identify what changes occurred during the time studied. As the largest community college district in the state, a study that might explain the uniquely shaped lines may provide for greater insight into the system.

Third, a qualitative study could be completed on non-funded, single-campus district colleges to determine the strategies they were using to assist with student success. This sub-population is the group that consistently had the highest mean success scores

and perhaps by identifying strategies or budget implications from this group, other sub-populations of the California Community College system could be affected positively.

Summary

The main purpose of this study was to investigate the association between equalization funding and course success and course retention in the California Community College system. This study identified the change-over-time trends and descriptive statistics including means, maximums, minimums, frequencies, and slopes. The study found that there was little difference once equalization funding was applied for course retention. In addition, when looking at only two sub-groups of non-funded and funded colleges, there the two subgroup's course success lines became closer together—with non-funded colleges (which already received a higher level of funding) having higher success lines. Given the steps in completing this study, however it was noticed that when colleges in the Los Angeles Community College District were extracted from the non-funded colleges because of a unique pattern in the district's change-over-time lines, the lines for non-funded and funded colleges remained about the same spread. In other words, it does not appear that when LA colleges were extracted from the mix that there was any association between equalization funding and student course success and student course retention.

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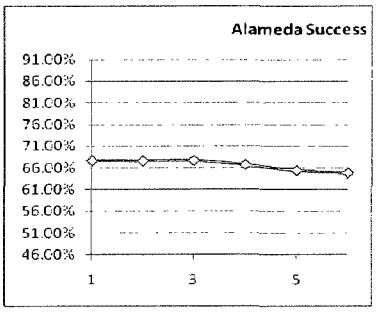
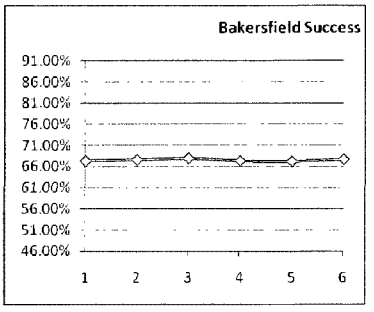
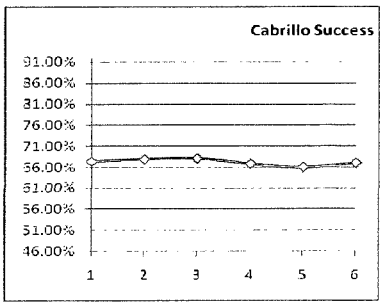
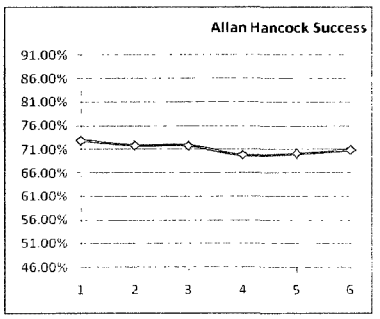
APPENDIX A

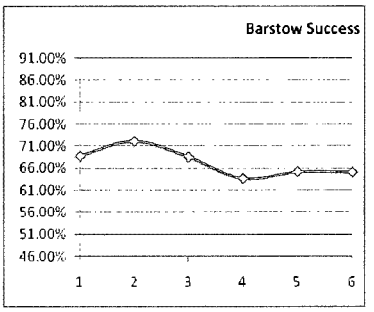
Group Level Analysis with each College's Success Plot Graphs Smoothed Out

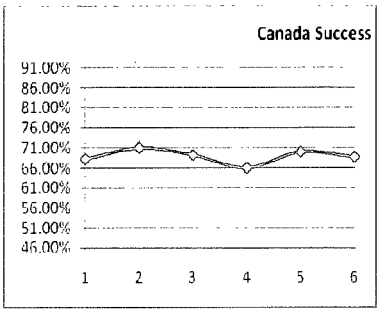


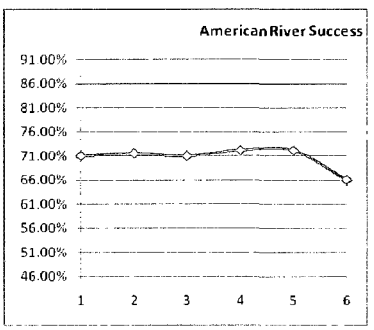


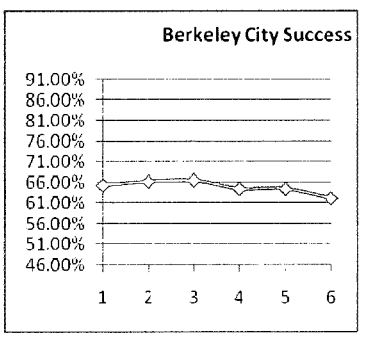


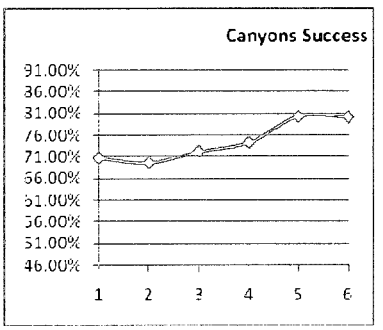


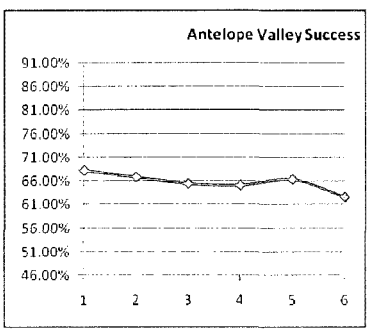


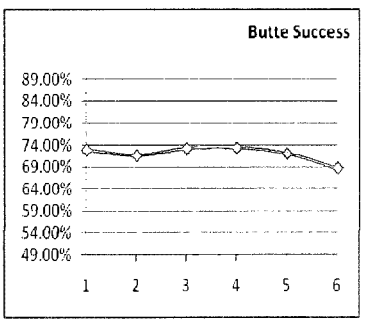


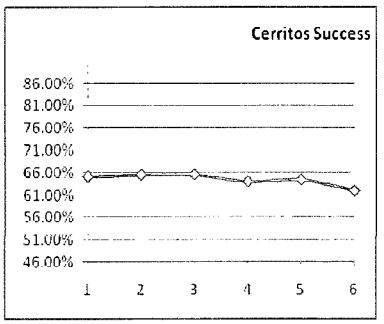


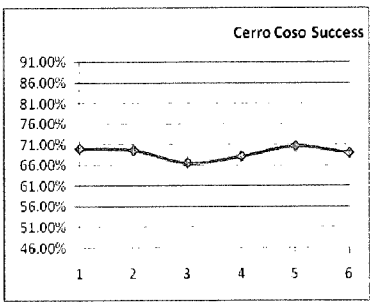








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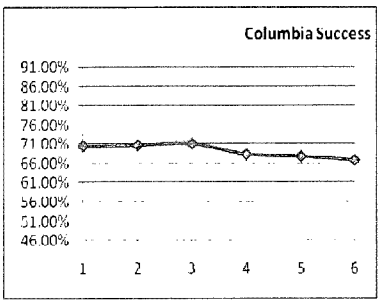
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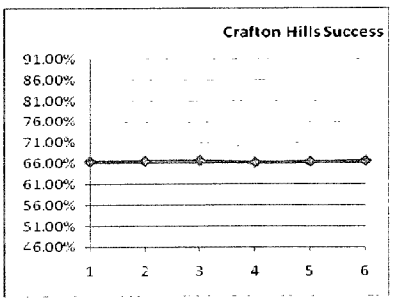
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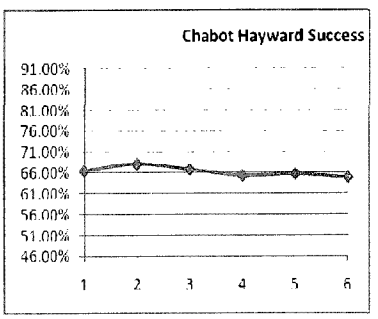
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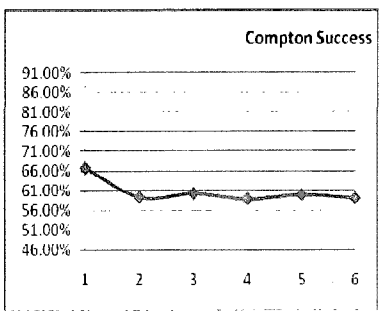
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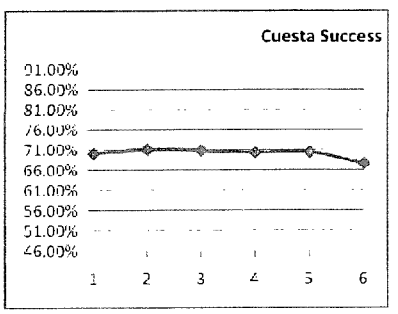
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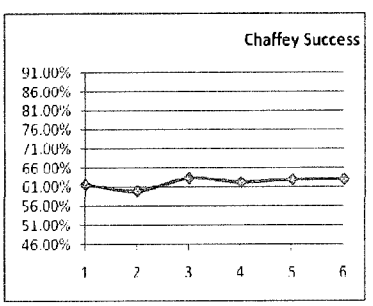
Chaffey Success
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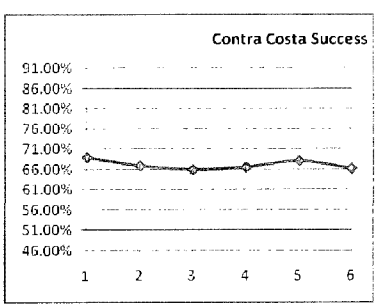
Contra Costa Success
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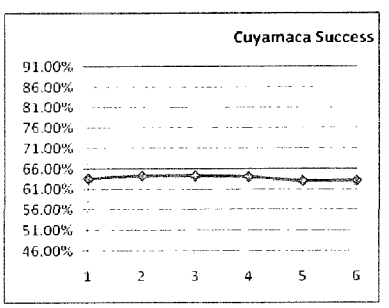
Cuyamaca Success
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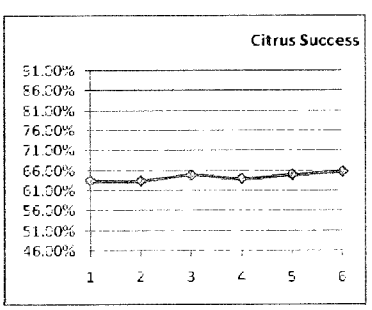
Citrus Success
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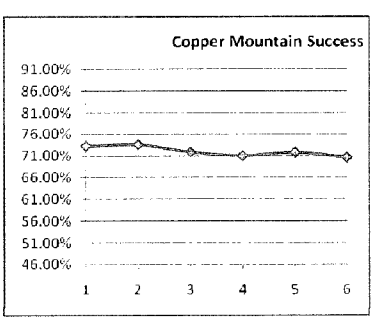
Copper Mountain Success
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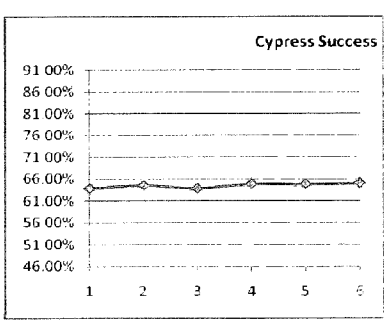
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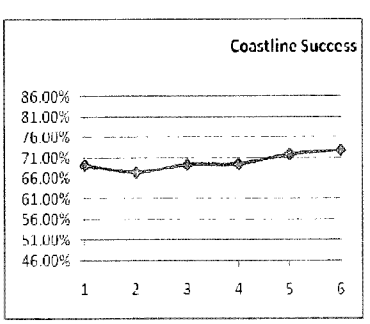
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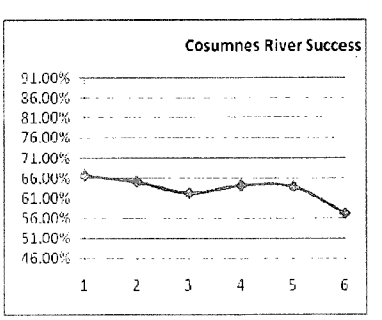
Cosumnes River Success
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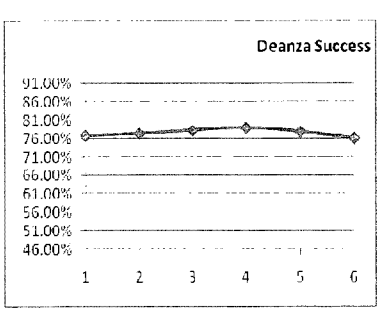
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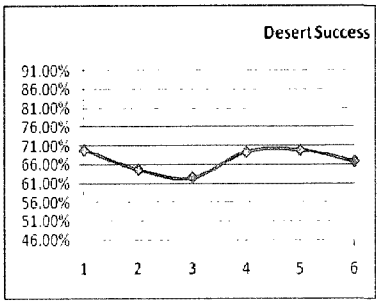
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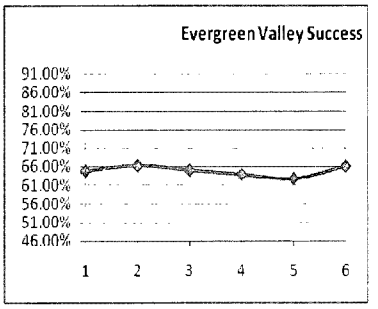
Evergreen Valley Success
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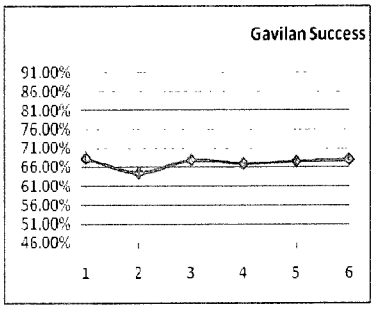
Gavilan Success
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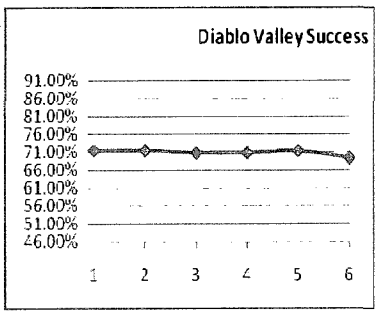
Diablo Valley Success
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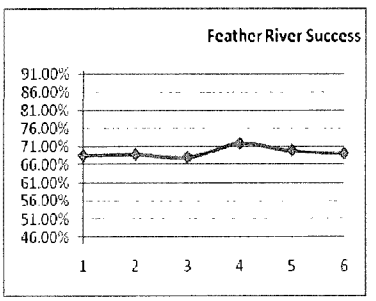
Feather River Success
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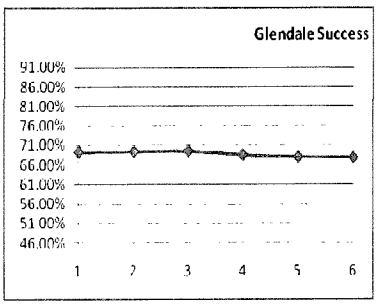
Glendale Success
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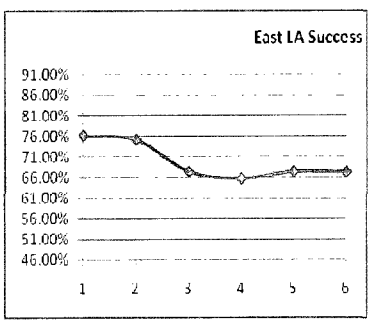
East LA Success
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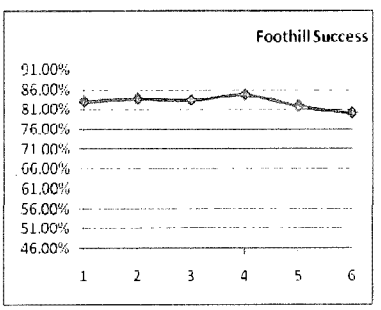
Foothill Success
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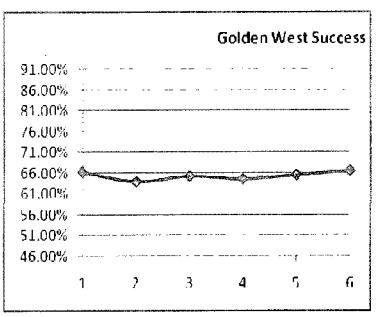
Golden West Success
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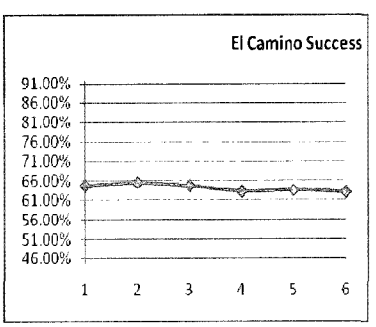
El Camino Success
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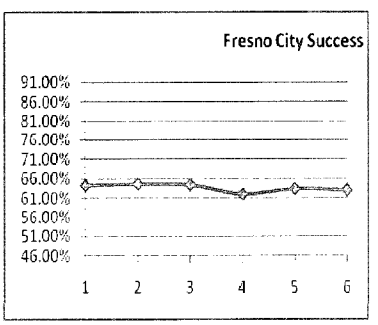
Fresno City Success
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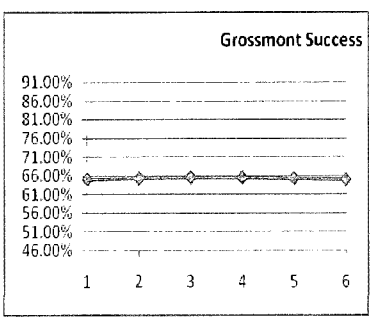
Grossmont Success
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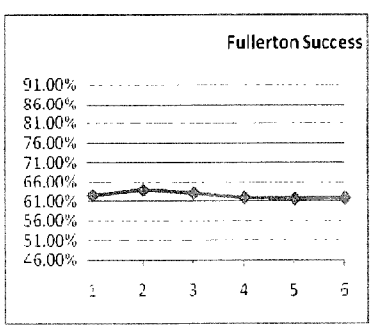
Fullerton Success
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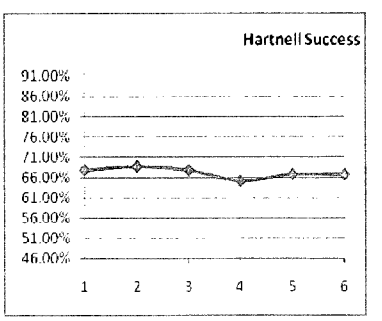
Hartnell Success
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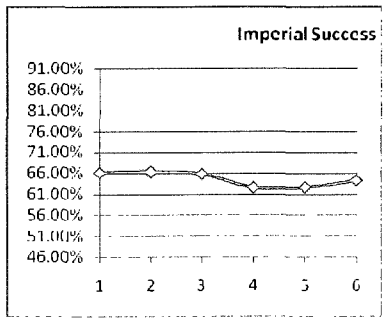
Imperial Success
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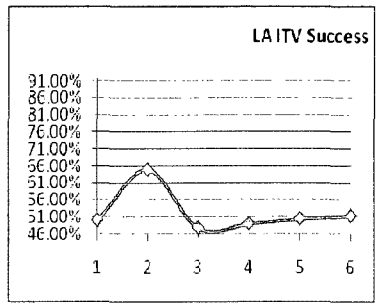
LA ITV Success
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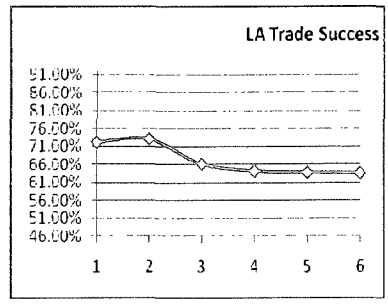
LA Trade Success
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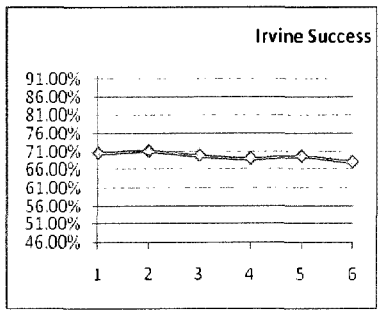
Irvine Success
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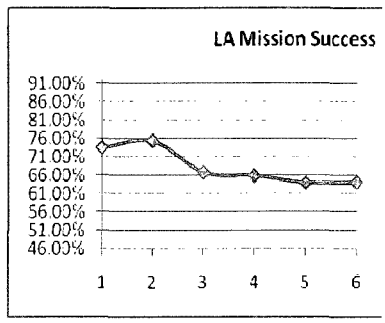
LA Mission Success
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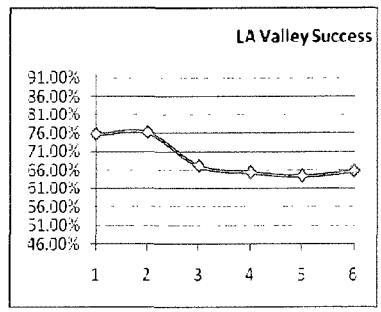
LA Valley Success
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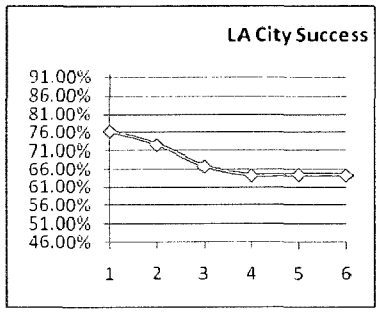
LA City Success
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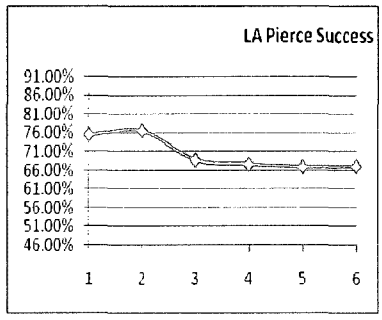
LA Pierce Success
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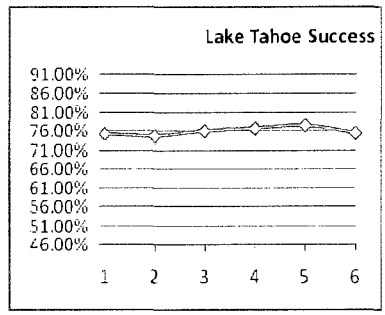
Lake Tahoe Success
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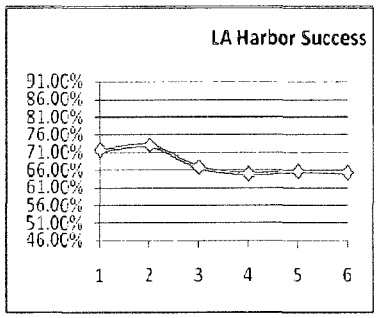
LA Harbor Success
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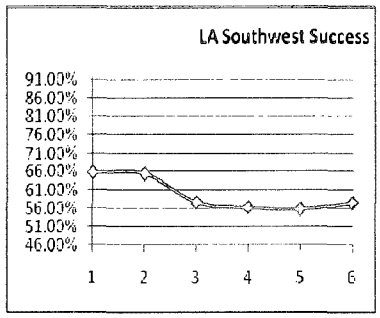
LA Southwest Success
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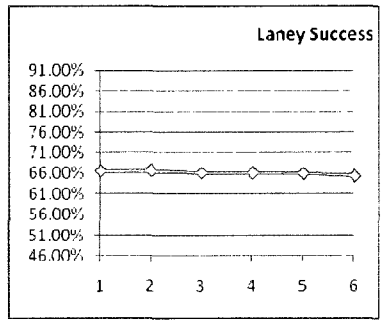
Laney Success
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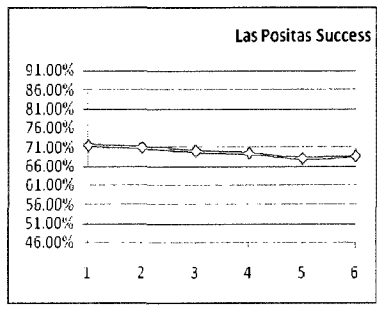
Las Positas Success
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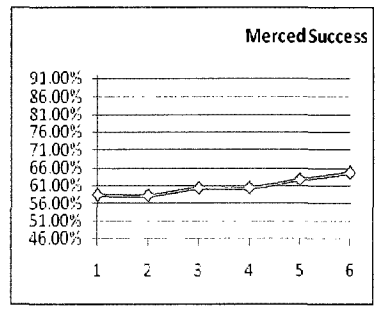
Merced Success
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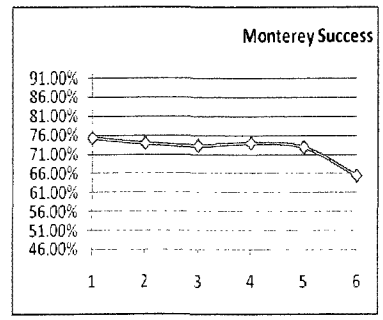
Monterey Success
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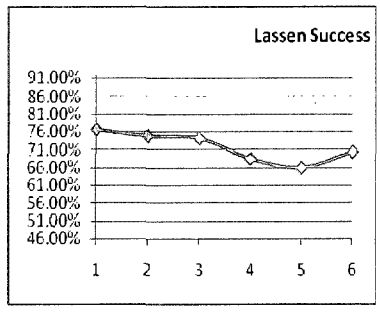
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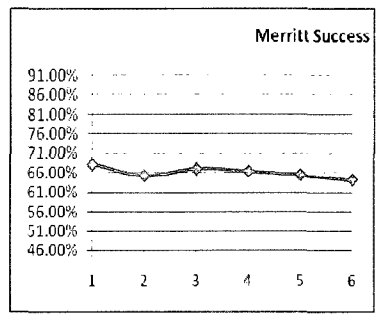
Merritt Success
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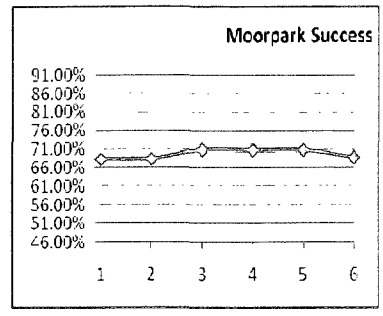
Moorpark Success
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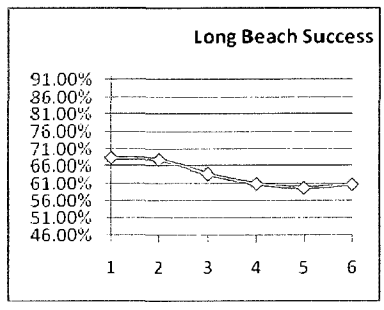
Long Beach Success
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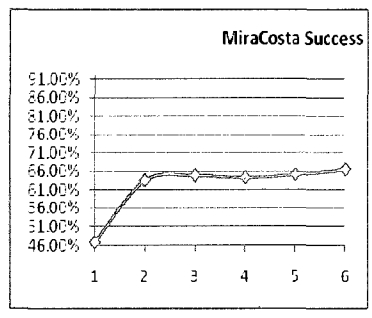
MiraCosta Success
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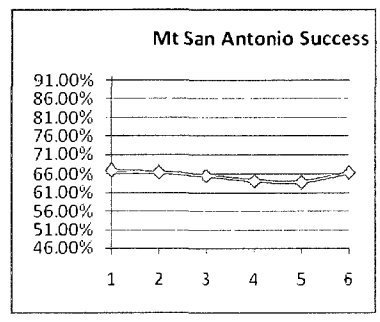
Mt San Antonio Success
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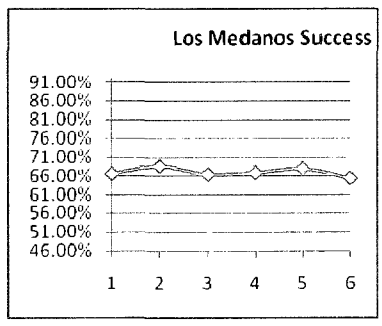
Los Medanos Success
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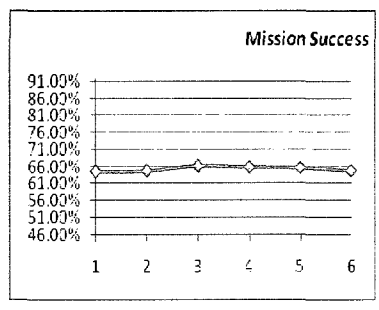
Mission Success
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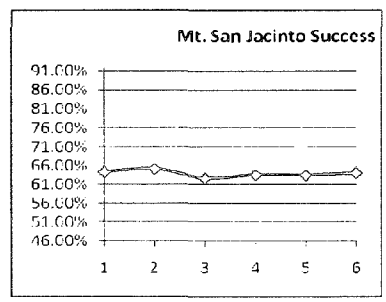
Mt. San Jacinto Success
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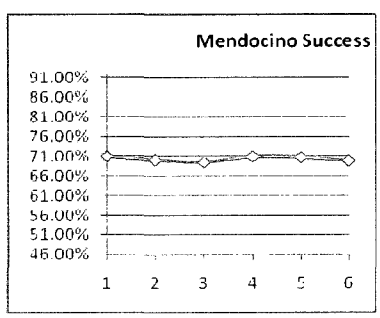
Mendocino Success
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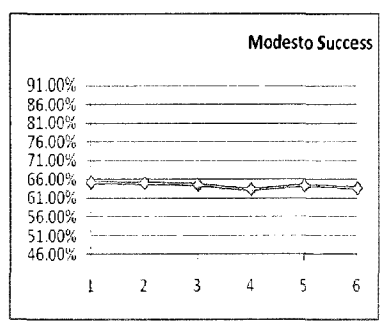
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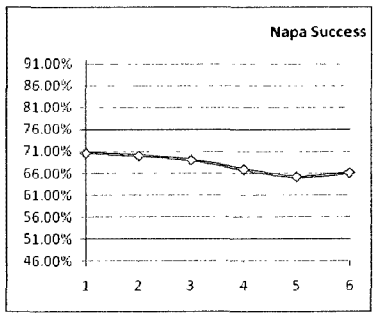
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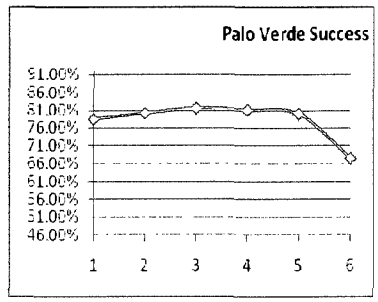
Palo Verde Success
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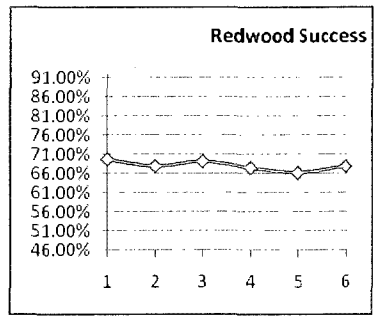
Redwood Success
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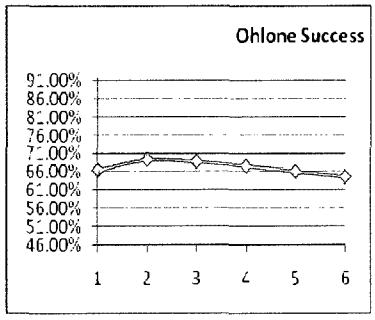
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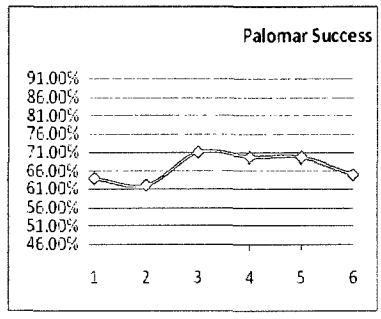
Palomar Success
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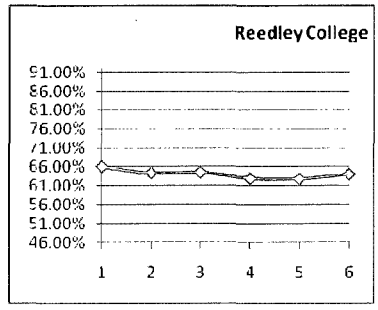
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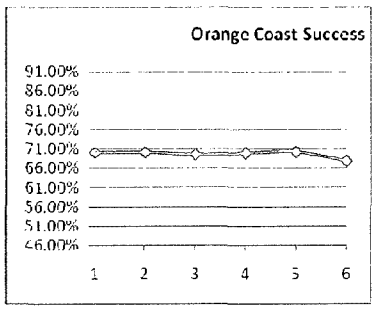
Orange Coast Success
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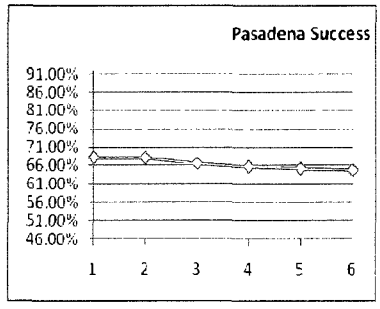
Pasadena Success
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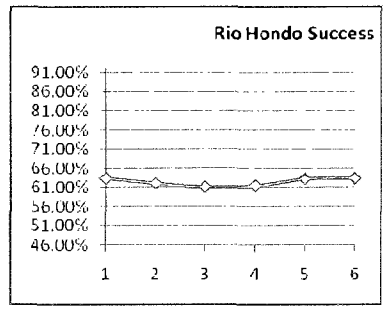
Rio Hondo Success
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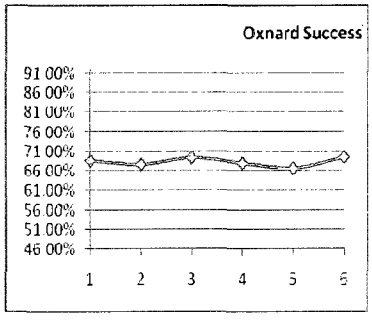
Oxnard Success
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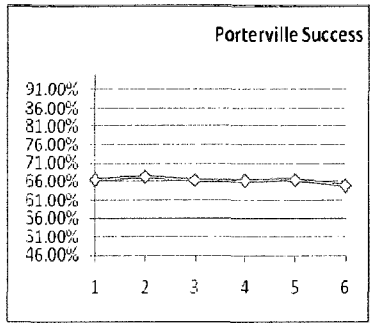
Porterville Success
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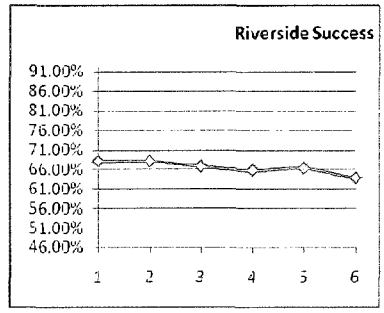
Riverside Success
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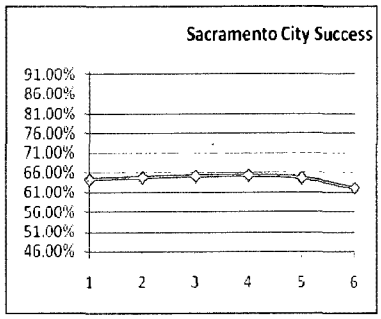
Sacramento City Success
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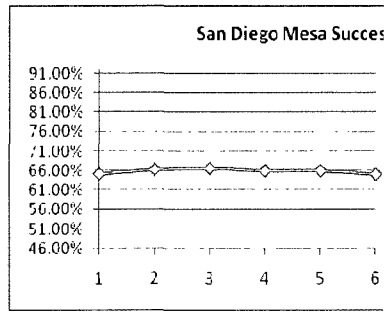
San Diego Mesa Succes
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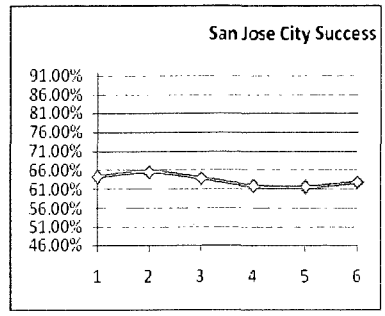
San Jose City Success
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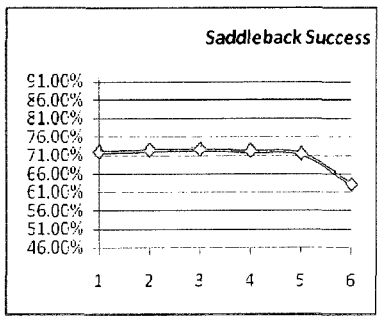
Saddleback Success
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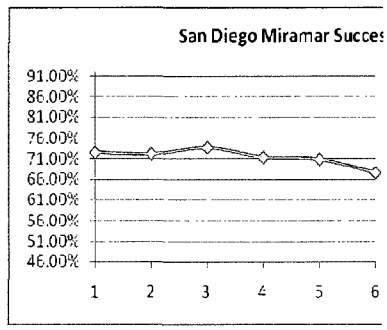
San Diego Miramar Succes
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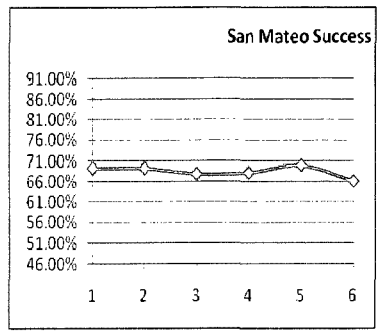
San Mateo Success
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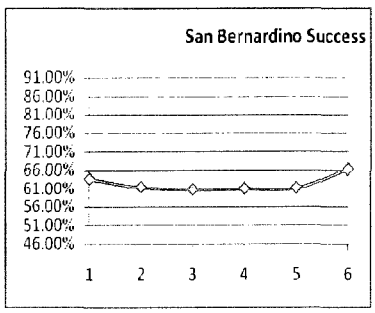
San Bernardino Success
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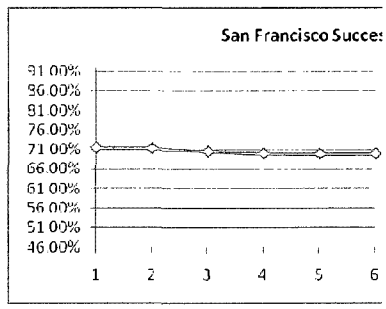
San Francisco Succes
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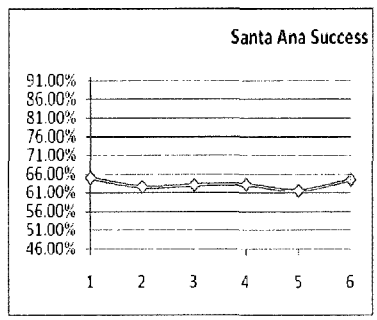
Santa Ana Success
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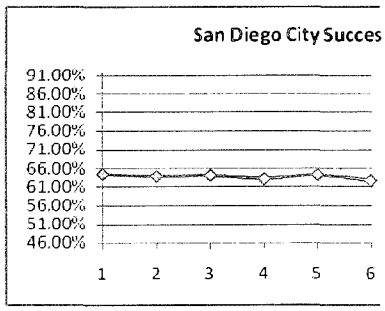
San Diego City Succes
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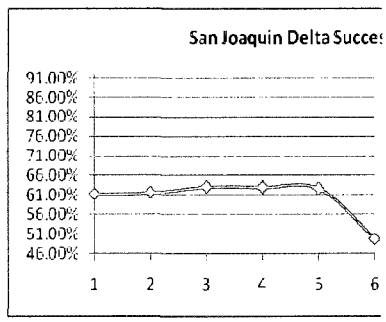
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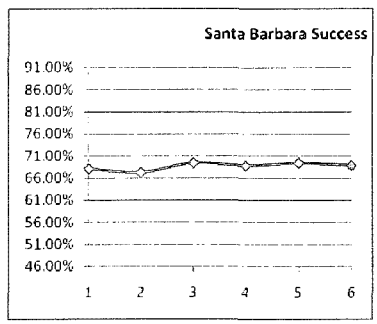
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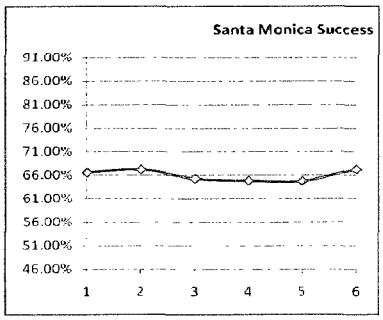
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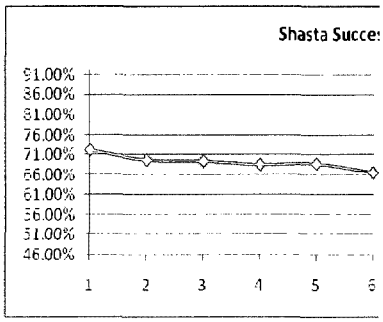
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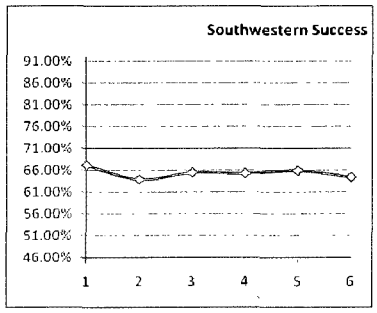
Southwestern Success
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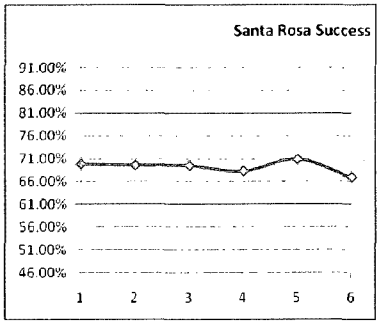
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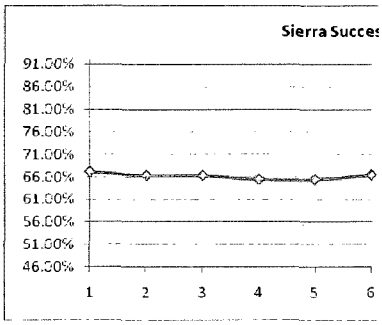
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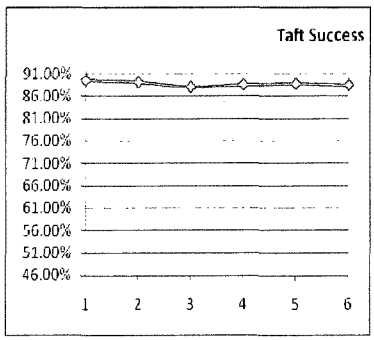
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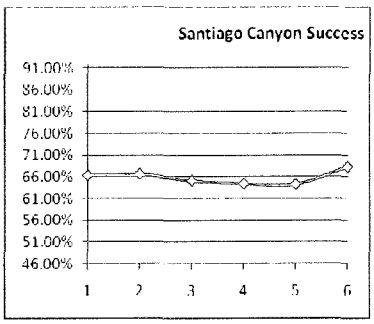
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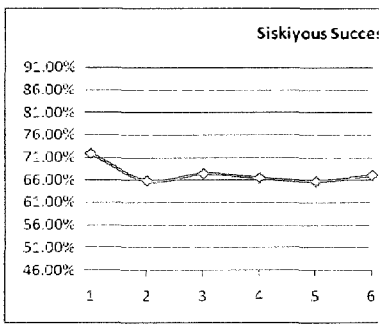
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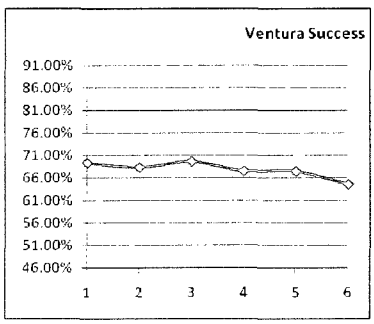
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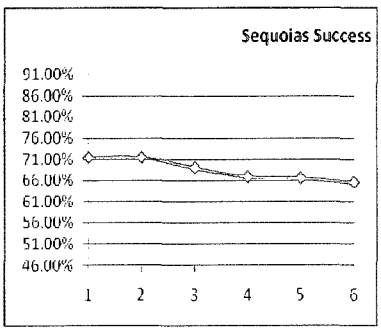
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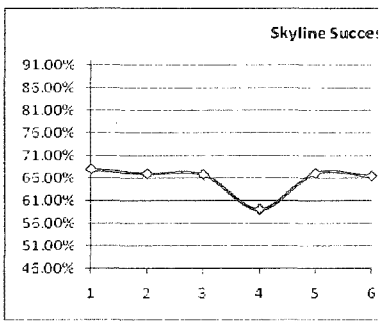
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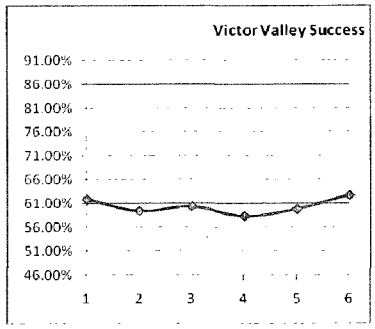
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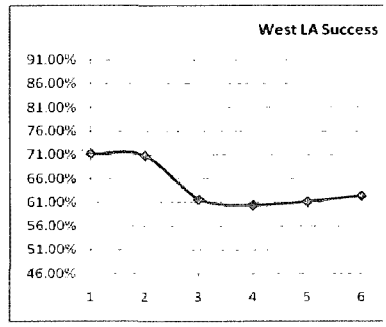
West LA Success
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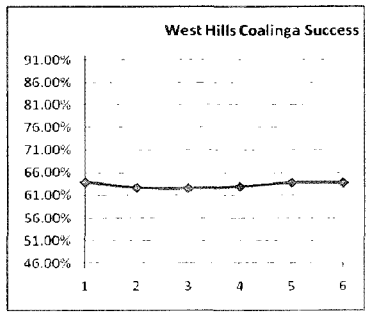
West Hills Coalinga Success
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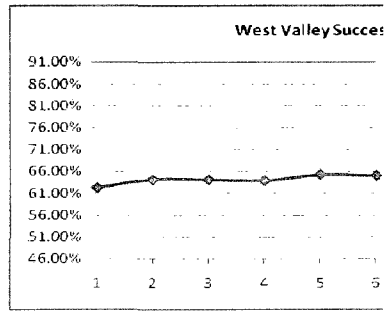
West Valley Succes
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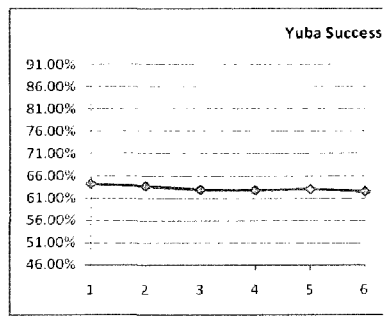
Yuba Success
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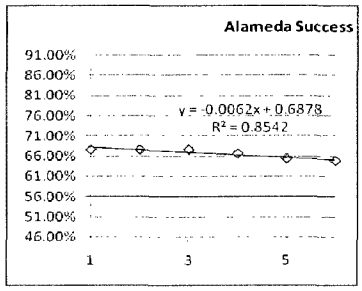
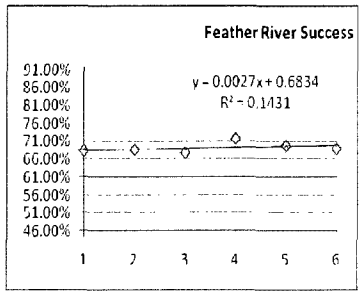
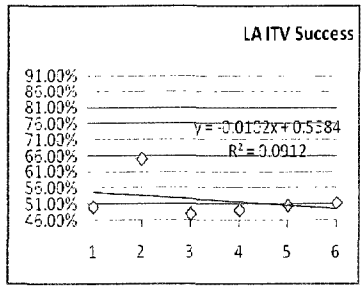
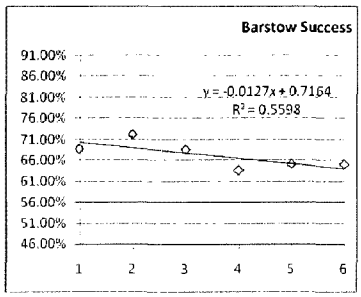
APPENDIX B

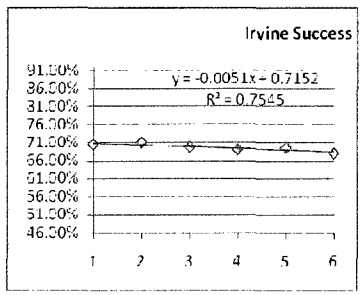
Fitted Trajectories of Non-Funded Colleges--Success

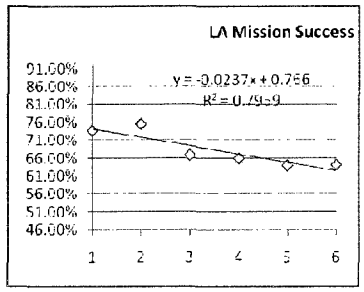


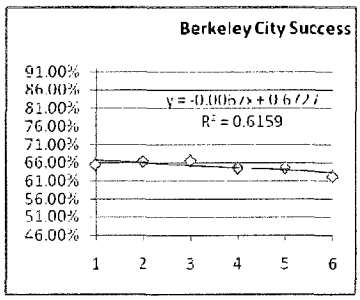


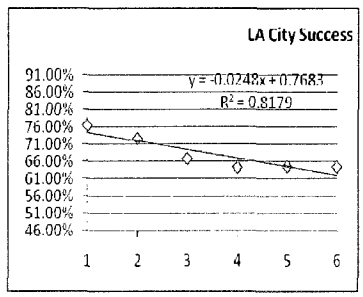


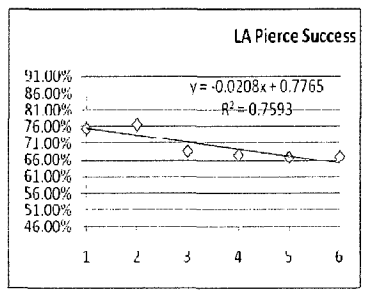


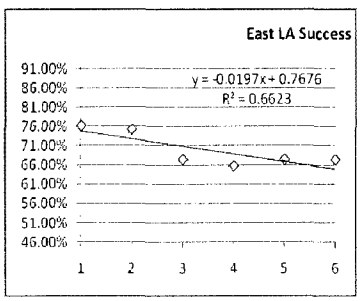


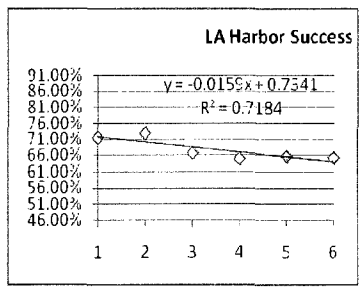


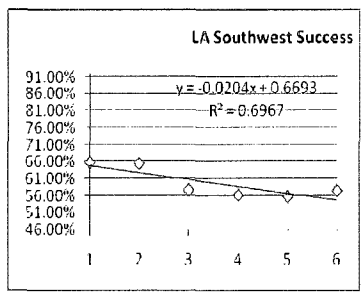


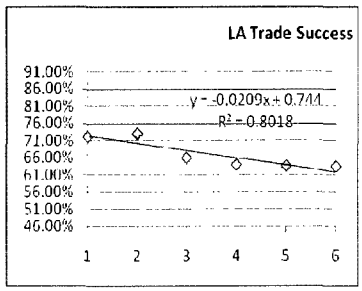


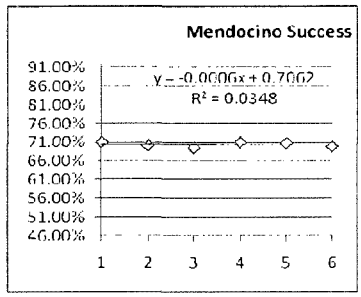


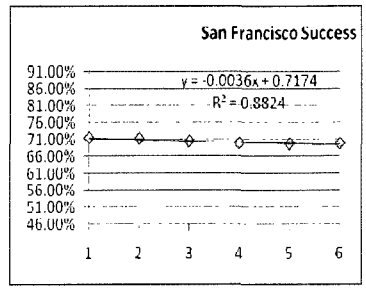


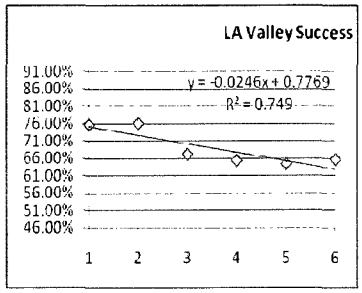


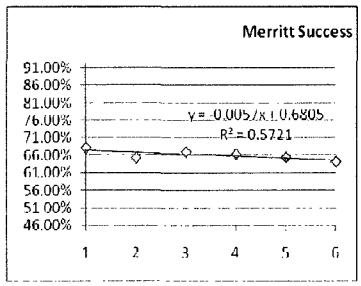


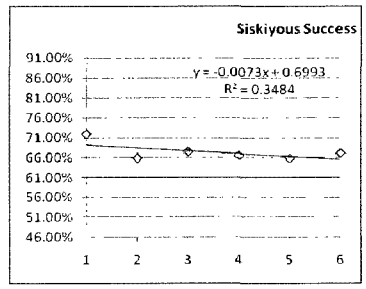

LA Trade Success
y = -0.0209x + 0.701
R² = 0.8018

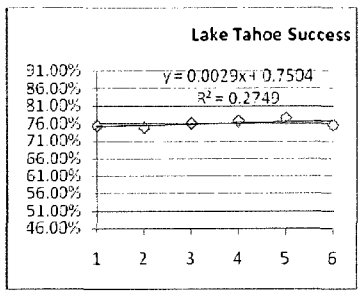

Mendocino Success
y = -0.0006x + 0.7062
R² = 0.0348

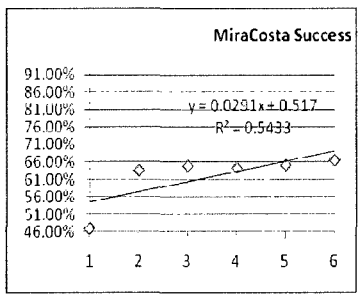

San Francisco Success
y = -0.0036x + 0.7174
R² = 0.8824

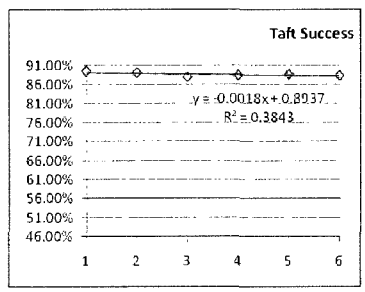

LA Valley Success
y = -0.0246x + 0.7769
R² = 0.749

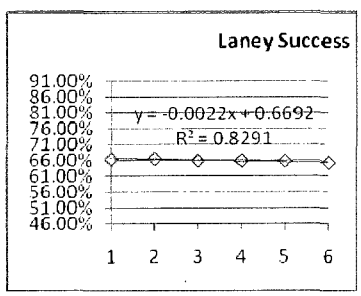

Merritt Success
y = -0.0057x + 0.6805
R² = 0.5721

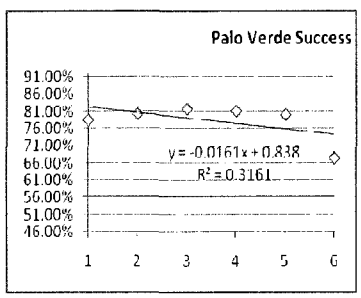

Siskiyous Success
y = -0.0073x + 0.6993
R² = 0.3484

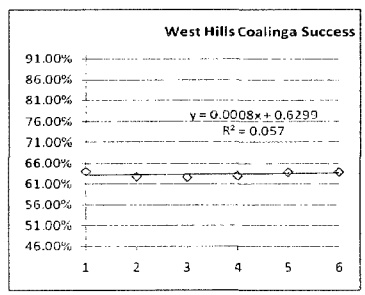

Lake Tahoe Success
y = 0.0029x + 0.7504
R² = 0.2749

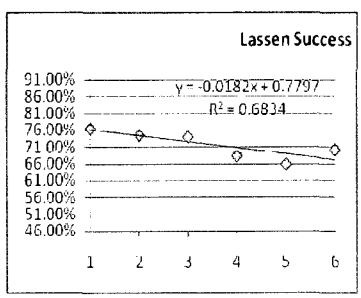

MiraCosta Success
y = 0.0291x + 0.517
R² = 0.5433

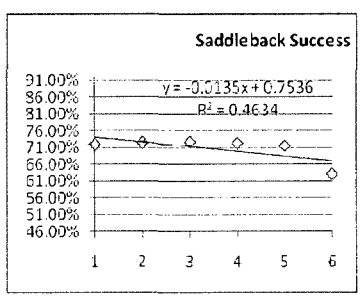

Taft Success
y = -0.0018x + 0.8937
R² = 0.3843

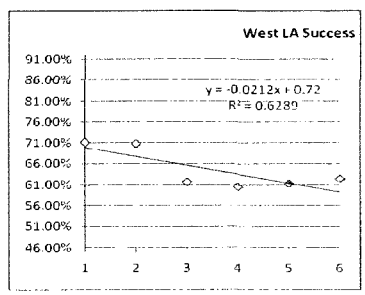

Laney Success
y = -0.0022x + 0.6692
R² = 0.8291


Palo Verde Success
y = -0.0161x + 0.838
R² = 0.3161


West Hills Coalinga Success
y = 0.0008x + 0.6299
R² = 0.057


Lassen Success
y = -0.0182x + 0.7797
R² = 0.6834

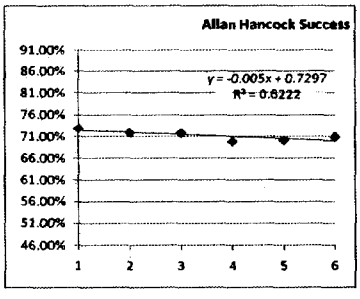

Saddleback Success
y = -0.0135x + 0.7536
R² = 0.4634

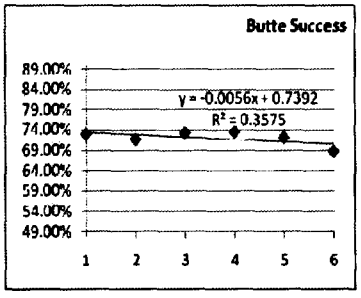

West LA Success
y = -0.0212x + 0.72
R² = 0.6289

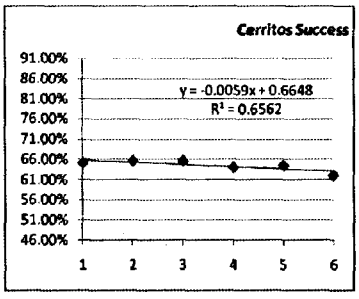
;

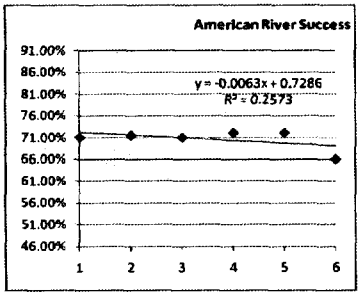
APPENDIX C

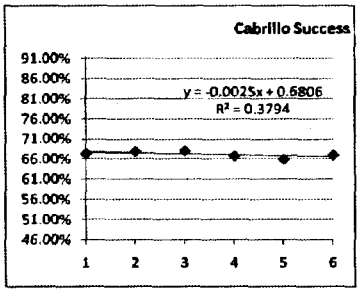
Fitted Trajectories of Funded Colleges--Success

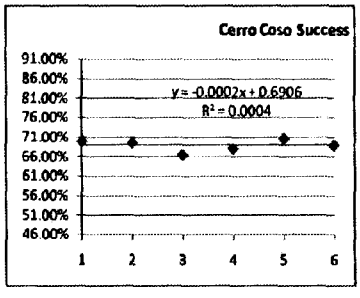


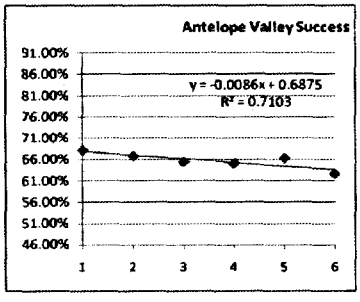


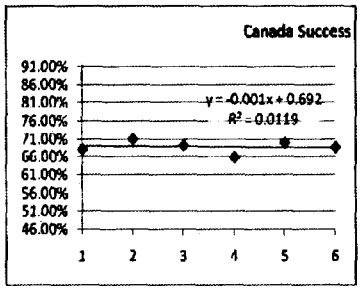


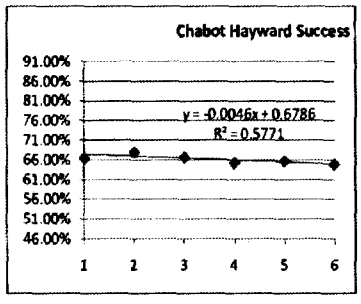


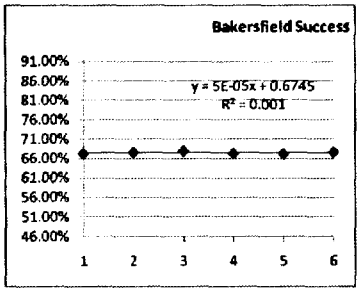


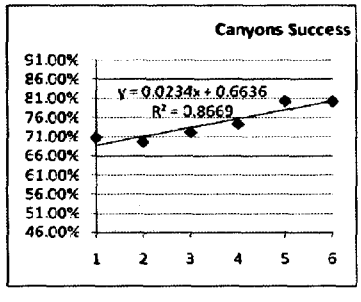


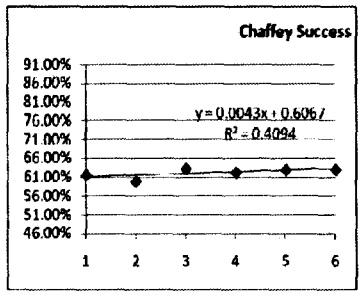


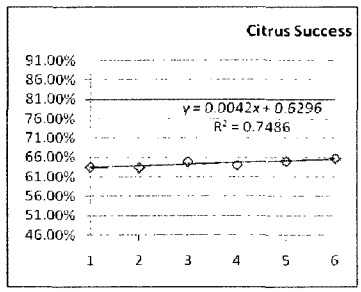


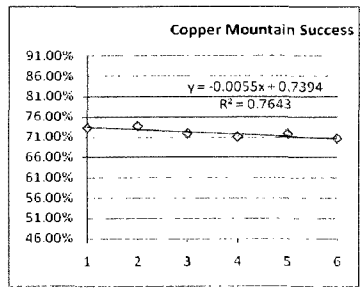


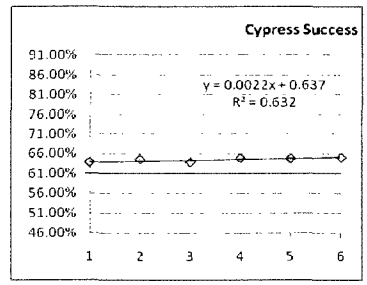


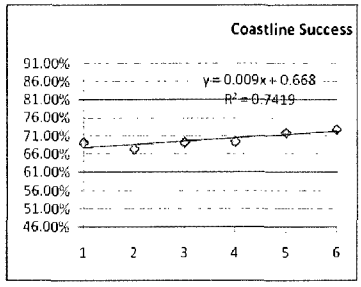


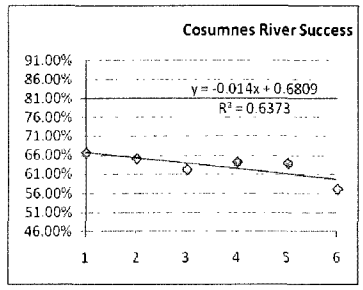


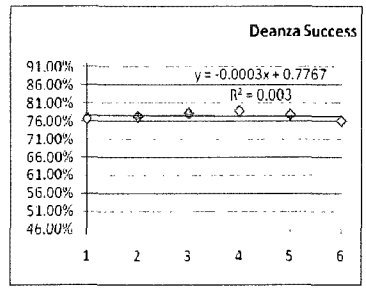

Citrus Success
y = 0.0042x + 0.6296
R² = 0.7486

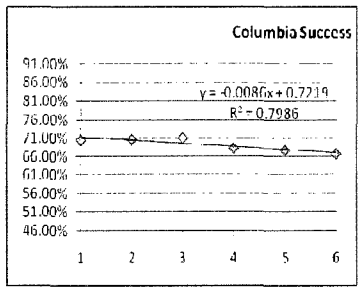

Copper Mountain Success
y = -0.0055x + 0.7394
R² = 0.7643

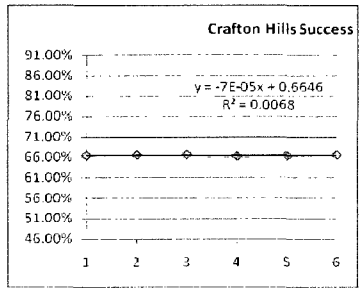

Cypress Success
y = 0.0022x + 0.637
R² = 0.632

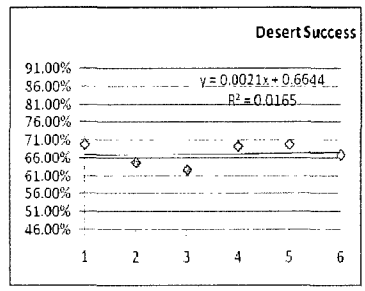

Coastline Success
y = 0.009x + 0.668
R² = 0.7419

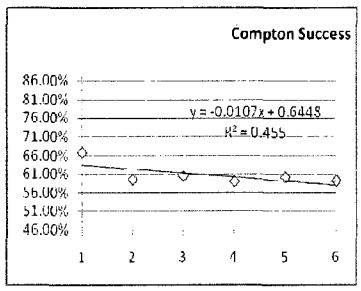

Cosumnes River Success
y = -0.014x + 0.6809
R² = 0.6373

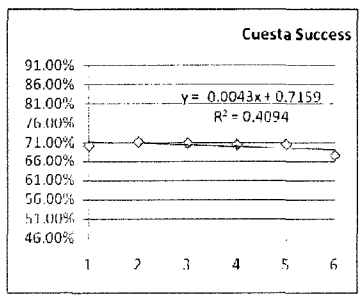

Deanza Success
y = -0.0003x + 0.7767
R² = 0.003

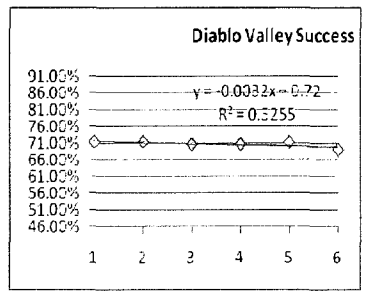

Columbia Success
y = -0.0086x + 0.7219
R² = 0.7986

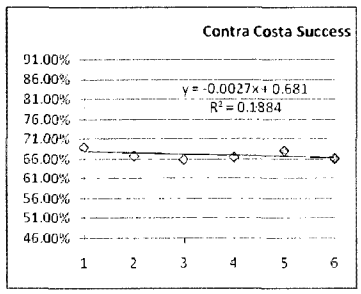

Crafton Hills Success
y = -7E-05x + 0.6646
R² = 0.0068

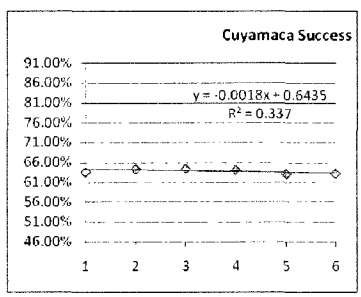

Desert Success
y = 0.0021x + 0.6644
R² = 0.0165

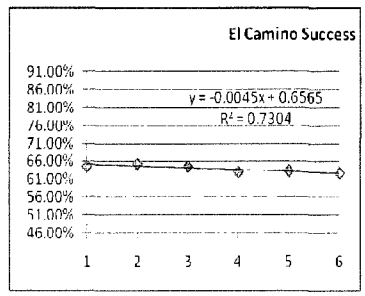

Compton Success
y = -0.0107x + 0.6448
R² = 0.455

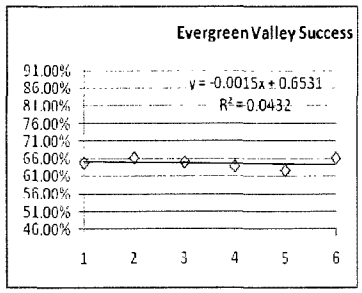

Cuesta Success
y = 0.0043x + 0.7159
R² = 0.4094

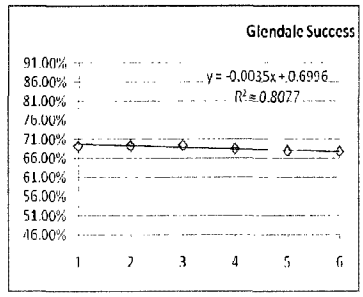

Diablo Valley Success
y = -0.0032x + 0.72
R² = 0.5255

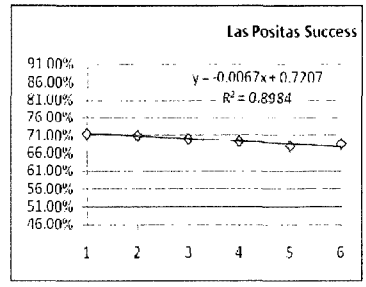

Contra Costa Success
y = -0.0027x + 0.681
R² = 0.1884

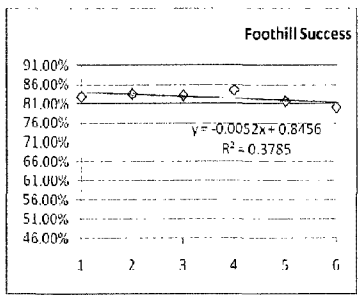

Cuyamaca Success
y = -0.0018x + 0.6435
R² = 0.337

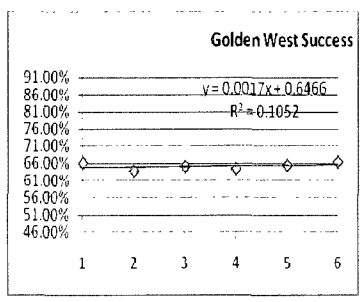

El Camino Success
y = -0.0045x + 0.6565
R² = 0.7304

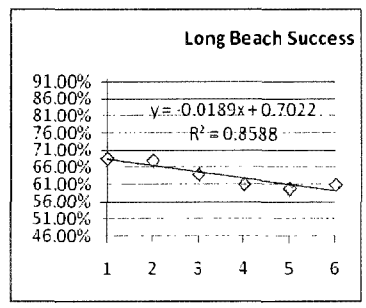

Evergreen Valley Success
y = -0.0015x + 0.6531
R² = 0.0432

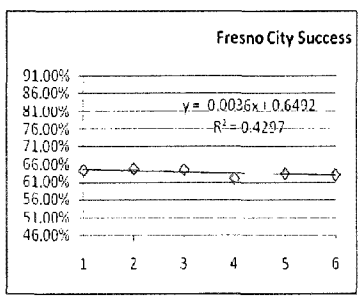

Glendale Success
y = -0.0035x + 0.6996
R² = 0.8027

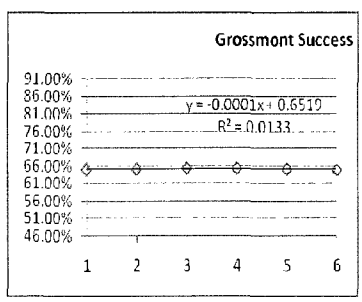

Las Positas Success
y = -0.0067x + 0.7207
R² = 0.8984

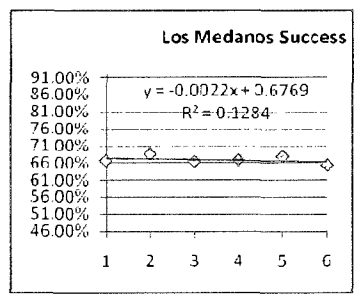

Foothill Success
y = -0.0052x + 0.8456
R² = 0.3785

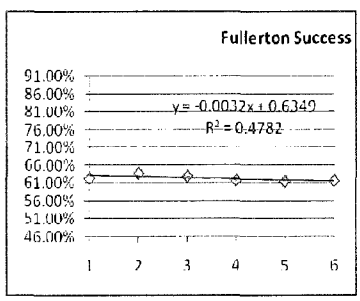

Golden West Success
y = 0.0017x + 0.6466
R² = 0.1052

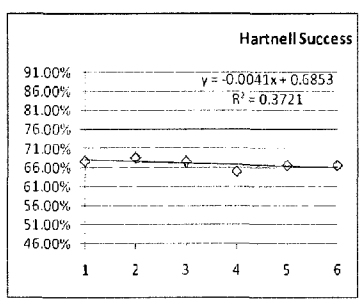

Long Beach Success
y = -0.0189x + 0.7022
R² = 0.8588

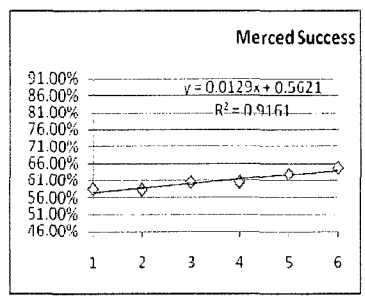

Fresno City Success
y = 0.0036x + 0.6492
R² = 0.4297

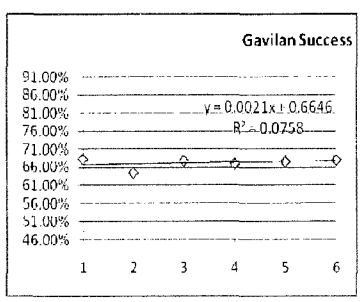

Grossmont Success
y = -0.0001x + 0.6519
R² = 0.0133

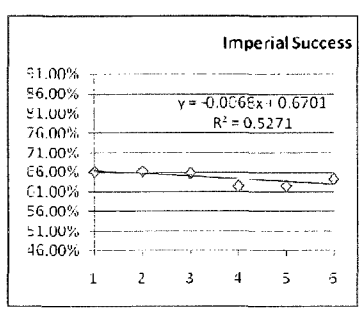

Los Medanos Success
y = -0.0022x + 0.6769
R² = 0.1284

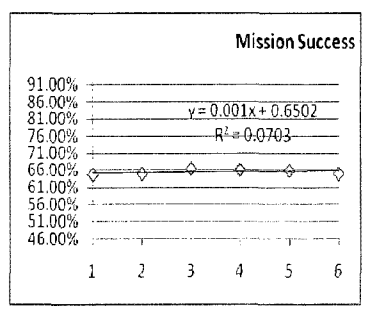

Fullerton Success
y = -0.0032x + 0.6349
R² = 0.4782

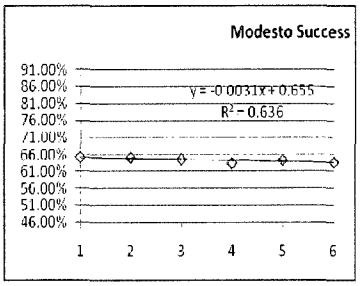

Hartnell Success
y = -0.0041x + 0.6853
R² = 0.3721

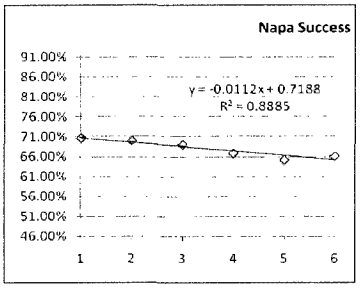

Merced Success
y = 0.0129x + 0.5621
R² = 0.9161

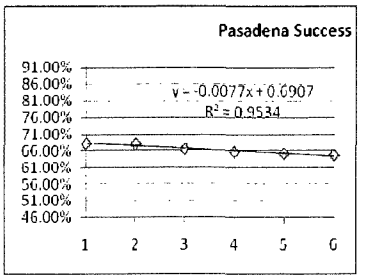

Gavilan Success
y = 0.0021x + 0.6646
R² = 0.0758

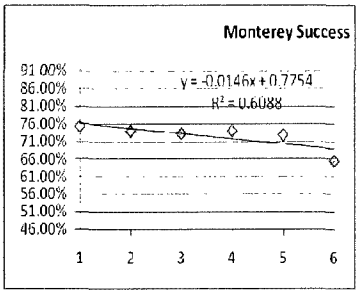

Imperial Success
y = -0.0068x + 0.6701
R² = 0.5271

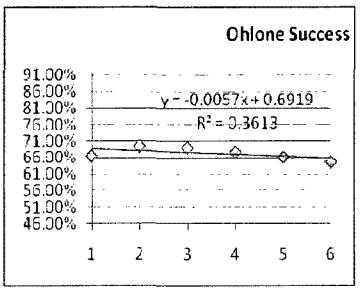

Mission Success
y = 0.001x + 0.6502
R² = 0.0703

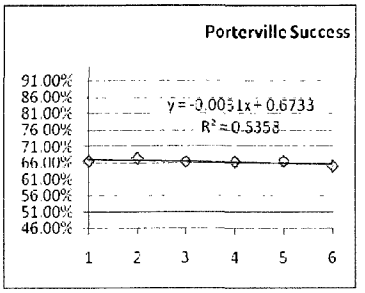

Modesto Success
y = -0.0031x + 0.655
R² = 0.636

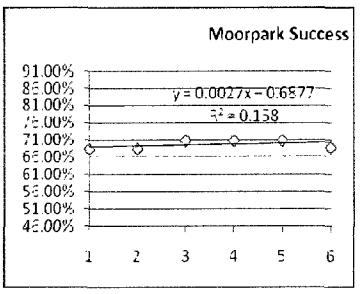

Napa Success
y = -0.0112x + 0.7188
R² = 0.8885

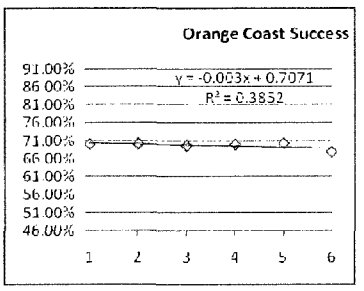

Pasadena Success
y = -0.0077x + 0.6907
R² = 0.9534

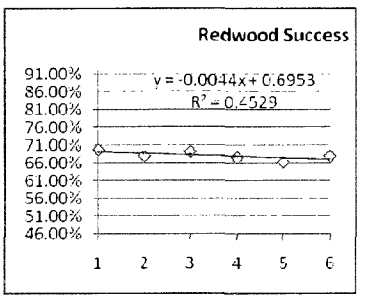

Monterey Success
y = -0.0146x + 0.7754
R² = 0.6088

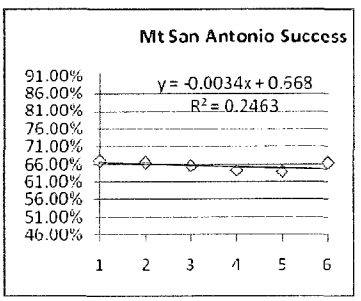

Ohlone Success
y = -0.0057x + 0.6919
R² = 0.3613

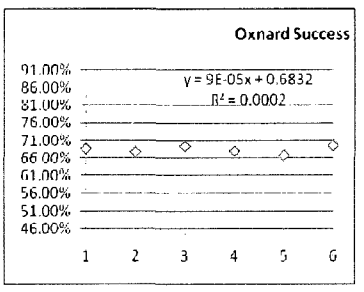

Porterville Success
y = -0.0051x + 0.6733
R² = 0.5358

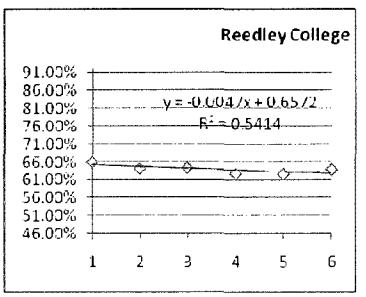

Moorpark Success
y = 0.0027x - 0.6877
R² = 0.138

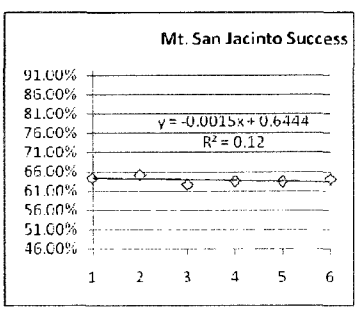

Orange Coast Success
y = -0.003x + 0.7071
R² = 0.3852

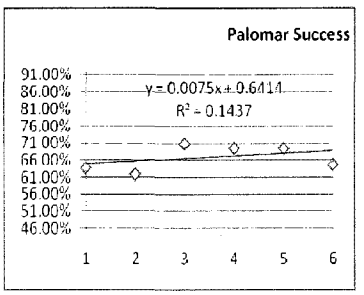

Redwood Success
y = -0.0044x + 0.6953
R² = 0.4529

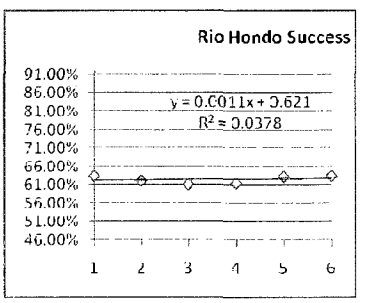

Mt San Antonio Success
y = -0.0034x + 0.668
R² = 0.2463

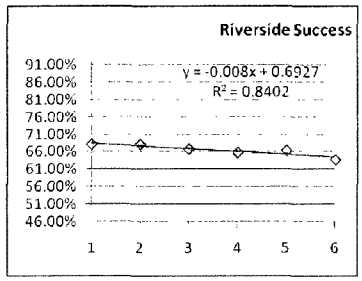

Oxnard Success
y = 9E-05x + 0.6832
R² = 0.0002

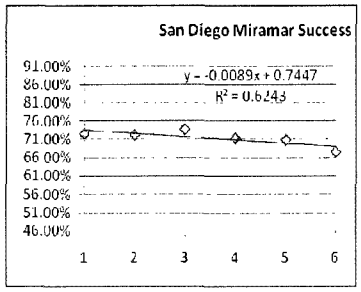

Reedley College
y = -0.0047x + 0.6572
R² = 0.5414

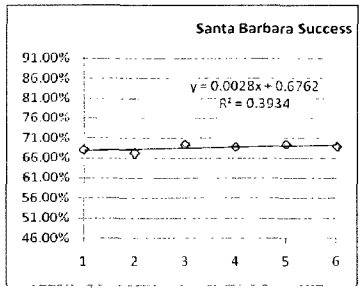

Mt. San Jacinto Success
y = -0.0015x + 0.6444
R² = 0.12

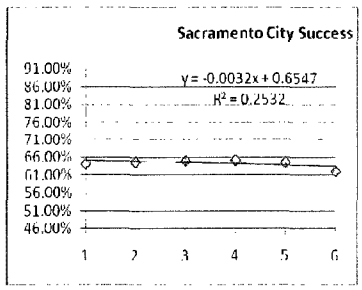

Palomar Success
y = 0.0075x + 0.6414
R² = 0.1437

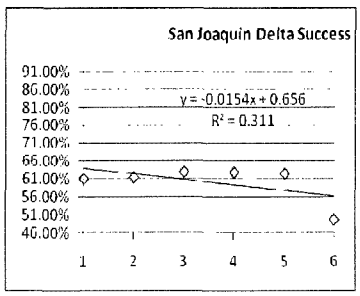

Rio Hondo Success
y = 0.0011x + 0.621
R² = 0.0378

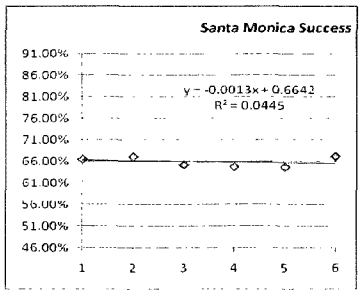

Riverside Success
y = -0.008x + 0.6927
R² = 0.8402

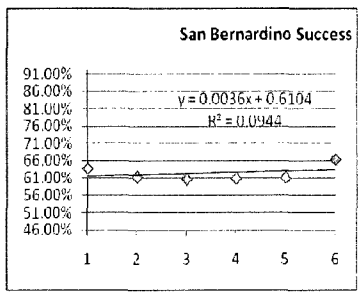

San Diego Miramar Success
y = -0.0089x + 0.7447
R² = 0.6243

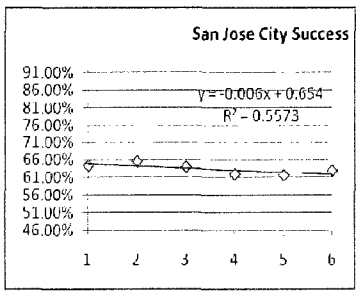

Santa Barbara Success
y = 0.0028x + 0.6762
R² = 0.3934

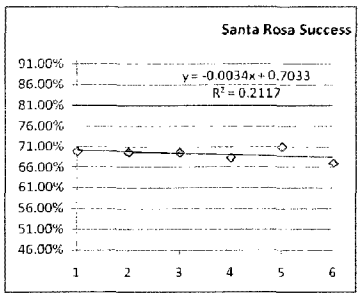

Sacramento City Success
y = -0.0032x + 0.6547
R² = 0.2532

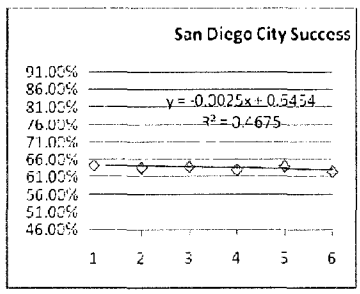

San Joaquin Delta Success
y = -0.0154x + 0.656
R² = 0.311

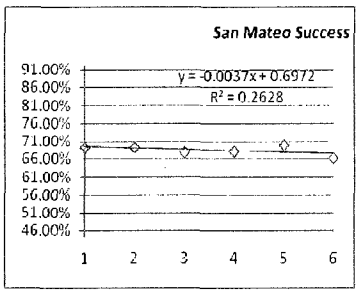

Santa Monica Success
y = -0.0013x + 0.6642
R² = 0.0445

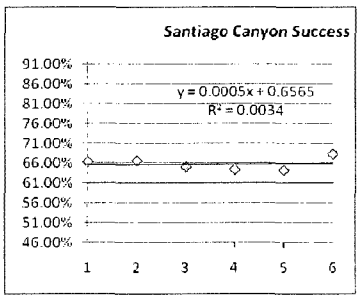

San Bernardino Success
y = 0.0036x + 0.6104
R² = 0.0944

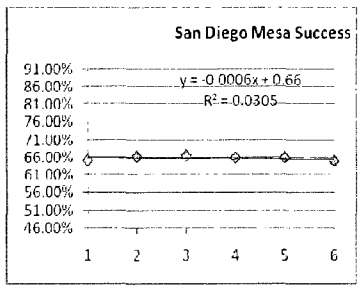

San Jose City Success
y = -0.006x + 0.654
R² = 0.5573

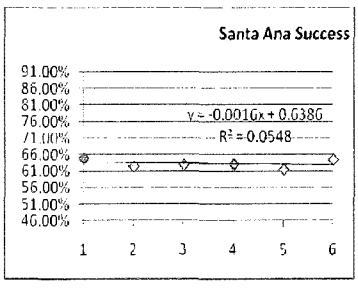

Santa Rosa Success
y = -0.0034x + 0.7033
R² = 0.2117

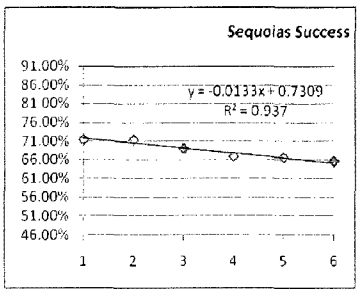

San Diego City Success
y = -0.0025x + 0.5454
R² = 0.4675

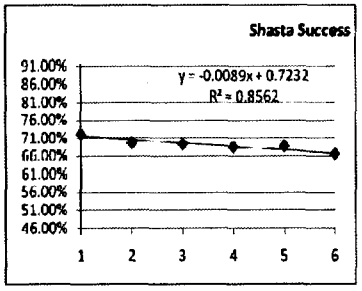

San Mateo Success
y = -0.0037x + 0.6972
R² = 0.2628

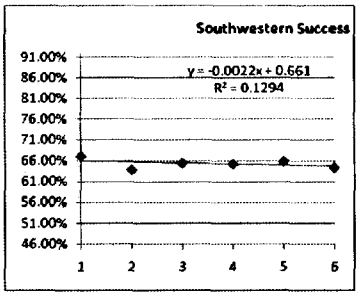

Santiago Canyon Success
y = 0.0005x + 0.6565
R² = 0.0034

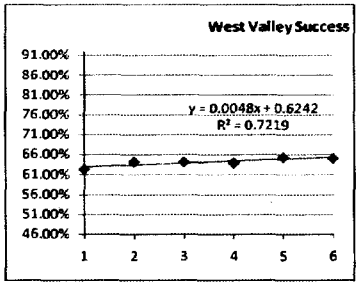

San Diego Mesa Success
y = -0.0006x + 0.66
R² = 0.0305

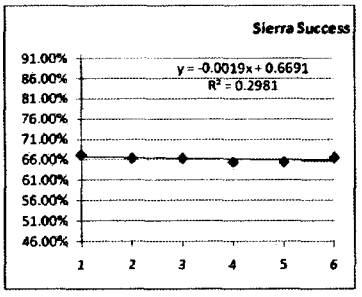

Santa Ana Success
y = -0.0016x + 0.6386
R² = 0.0548

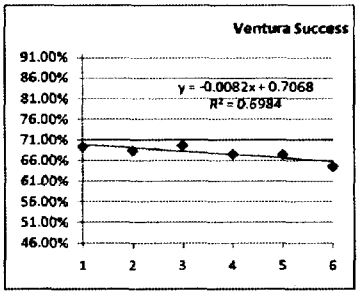

Sequoias Success
y = -0.0133x + 0.7309
R² = 0.937

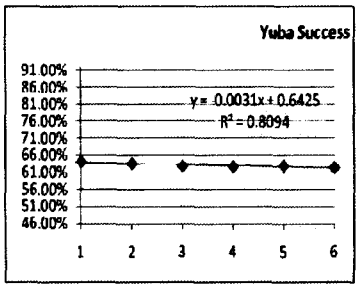

Shasta Success
y = -0.0089x + 0.7232
R² = 0.8562
91.00%
86.00%
81.00%
76.00%
71.00%
66.00%
61.00%
56.00%
51.00%
46.00%
1 2 3 4 5 6

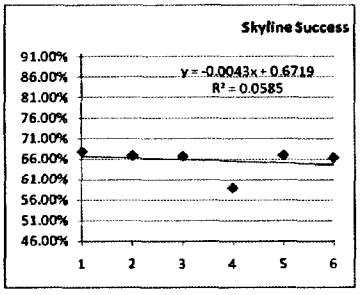

Southwestern Success
y = -0.0022x + 0.661
R² = 0.1294
91.00%
86.00%
81.00%
76.00%
71.00%
66.00%
61.00%
56.00%
51.00%
46.00%
1 2 3 4 5 6

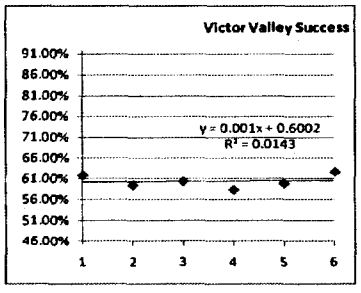

West Valley Success
y = 0.0048x + 0.6242
R² = 0.7219
91.00%
86.00%
81.00%
76.00%
71.00%
66.00%
61.00%
56.00%
51.00%
46.00%
1 2 3 4 5 6


Sierra Success
y = -0.0019x + 0.6691
R² = 0.2981
91.00%
86.00%
81.00%
76.00%
71.00%
66.00%
61.00%
56.00%
51.00%
46.00%
1 2 3 4 5 6


Ventura Success
y = -0.0082x + 0.7068
R² = 0.6984
91.00%
86.00%
81.00%
76.00%
71.00%
66.00%
61.00%
56.00%
51.00%
46.00%
1 2 3 4 5 6

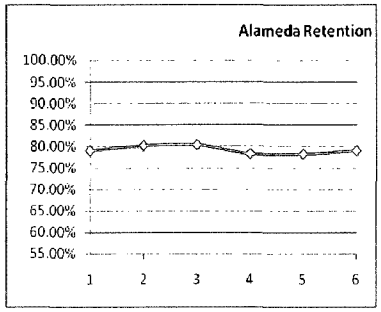

Yuba Success
y = 0.0031x + 0.6425
R² = 0.8094
91.00%
86.00%
81.00%
76.00%
71.00%
66.00%
61.00%
56.00%
51.00%
46.00%
1 2 3 4 5 6

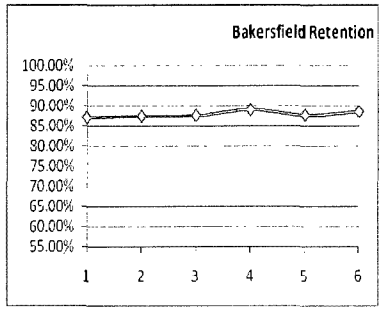

Skyline Success
y = -0.0043x + 0.6719
R² = 0.0585
91.00%
86.00%
81.00%
76.00%
71.00%
66.00%
61.00%
56.00%
51.00%
46.00%
1 2 3 4 5 6

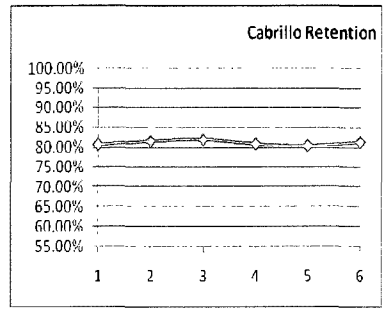

Victor Valley Success
y = 0.001x + 0.6002
R² = 0.0143
91.00%
86.00%
81.00%
76.00%
71.00%
66.00%
61.00%
56.00%
51.00%
46.00%
1 2 3 4 5 6

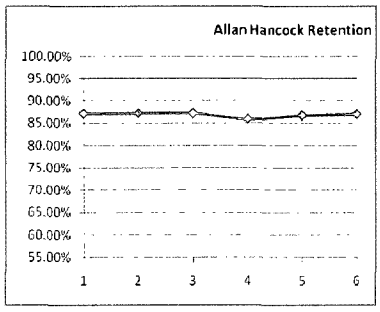
APPENDIX D

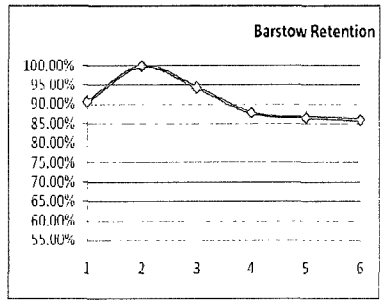
Group Level Analysis with Each College's Retention Plot Graphs Smoothed Out

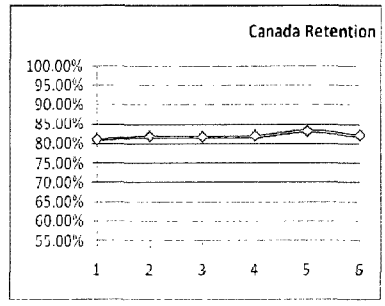


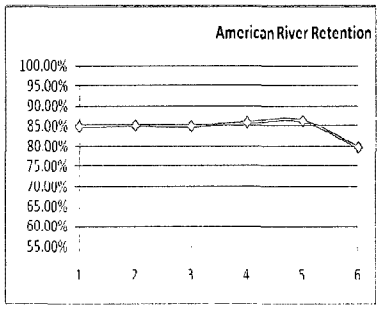


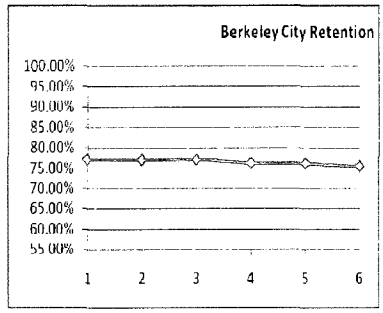


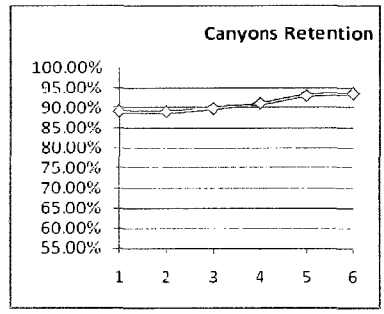


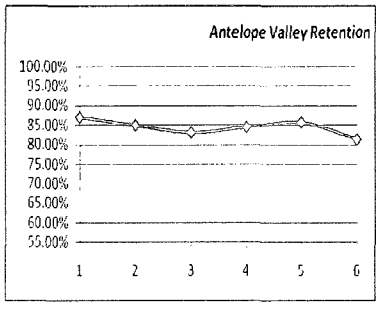


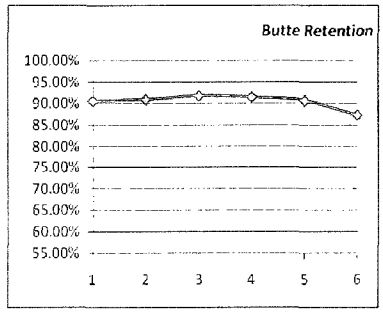


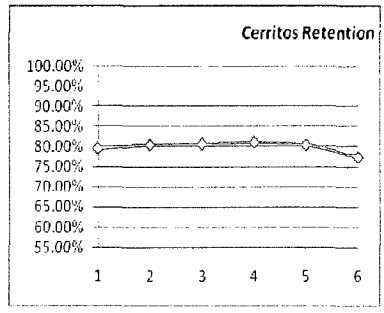


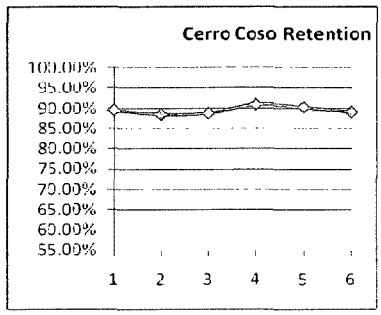











Cerro Coso Retention
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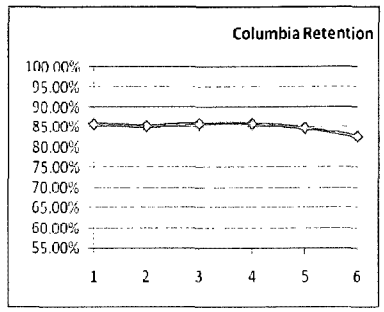
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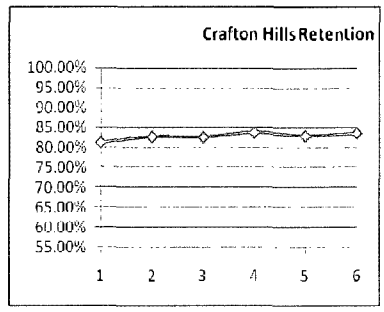
Crafton Hills Retention
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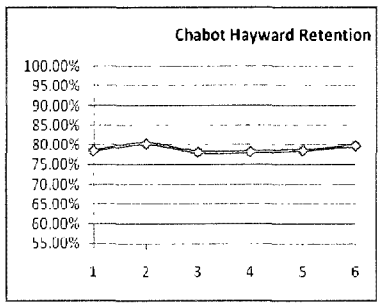
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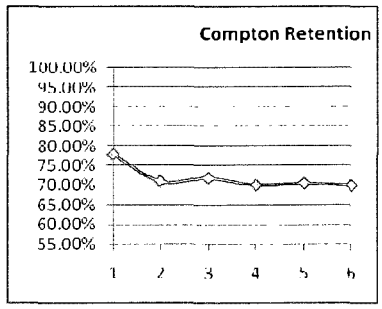
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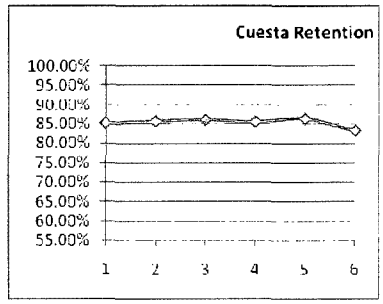
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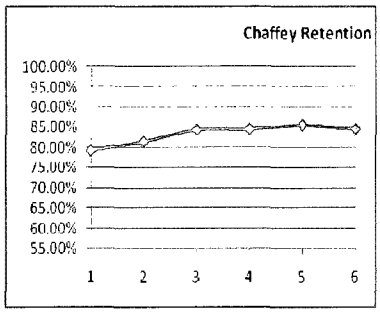
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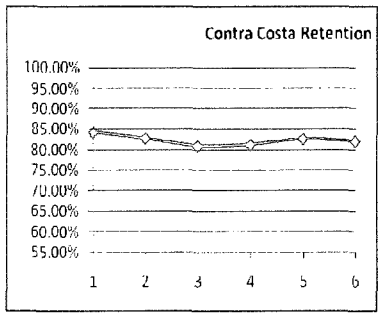
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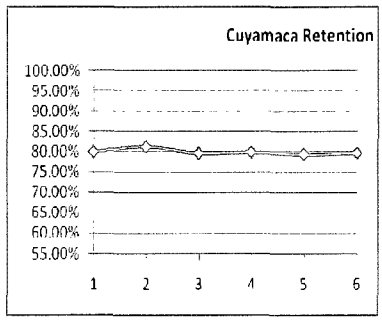
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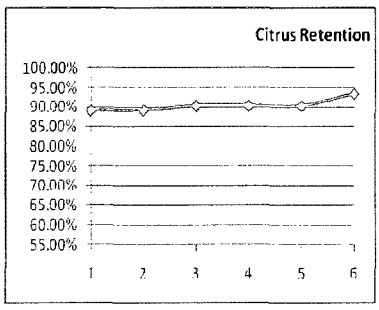
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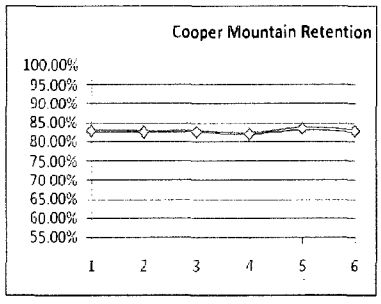
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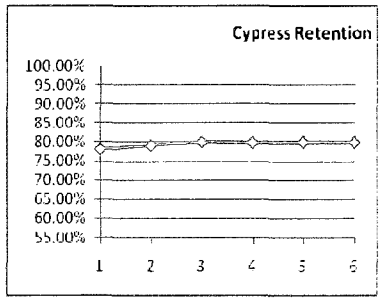
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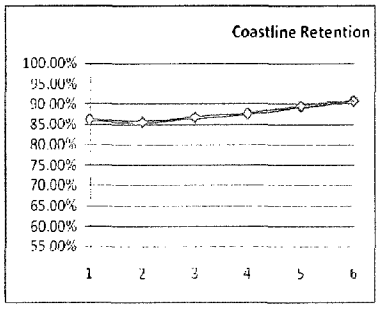
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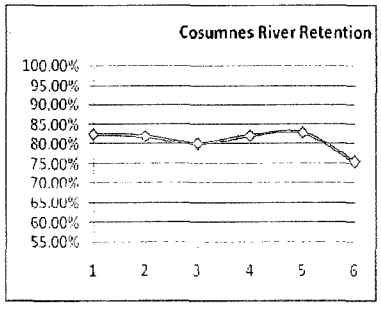
Cosumnes River Retention
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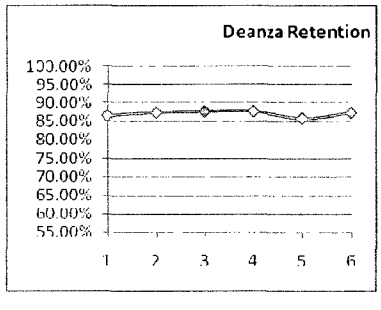
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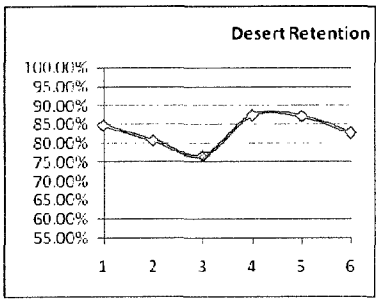
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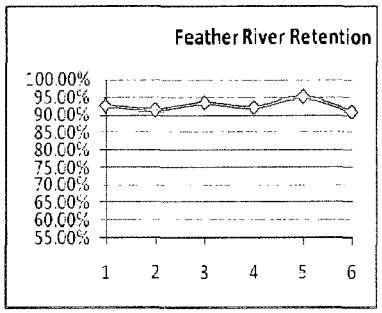
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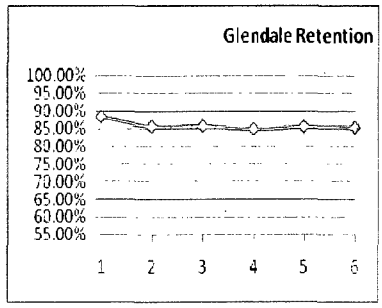
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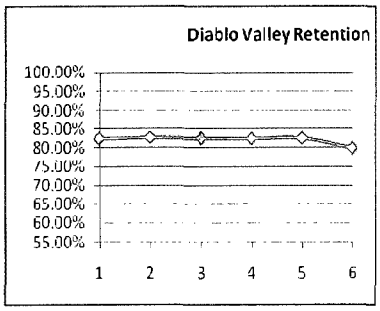
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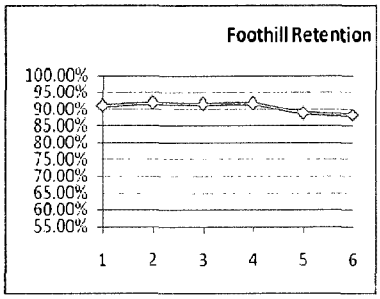
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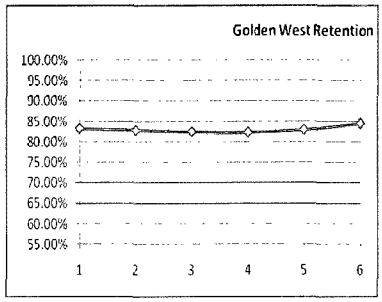
Golden West Retention
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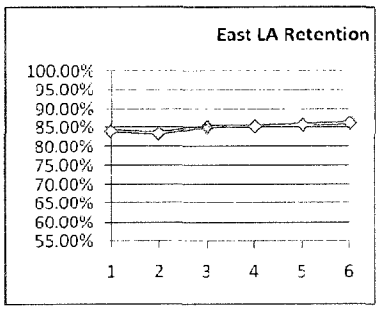
East LA Retention
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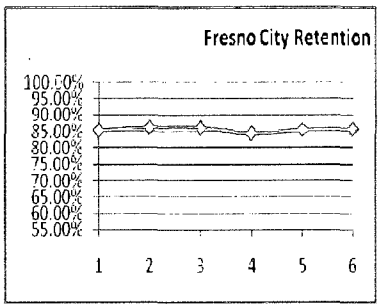
Fresno City Retention
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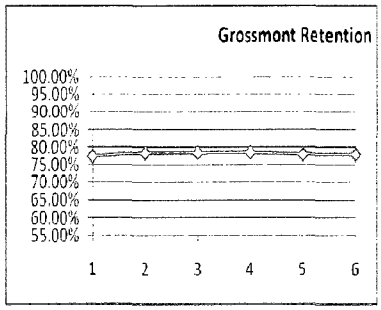
Grossmont Retention
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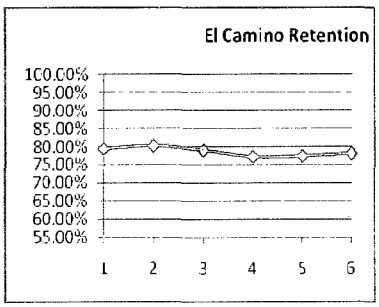
El Camino Retention
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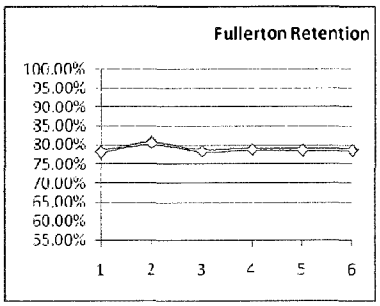
Fullerton Retention
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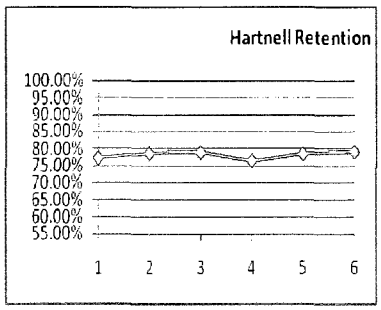
Hartnell Retention
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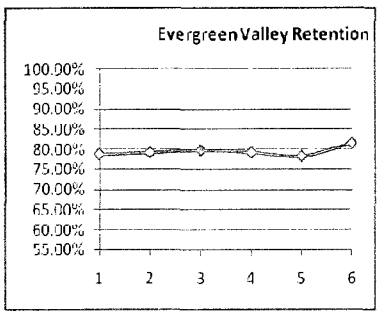
Evergreen Valley Retention
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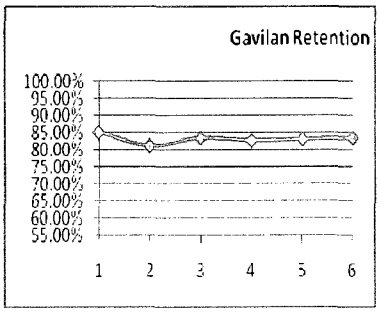
Gavilan Retention
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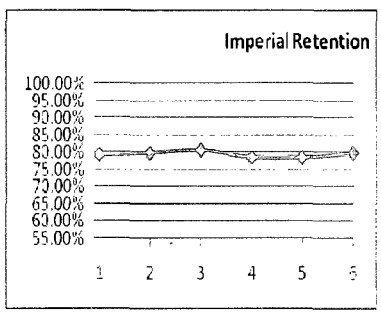
Imperial Retention
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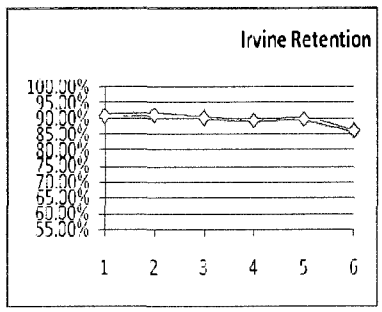
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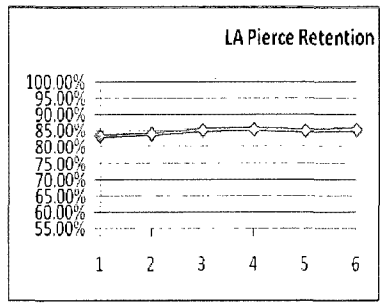
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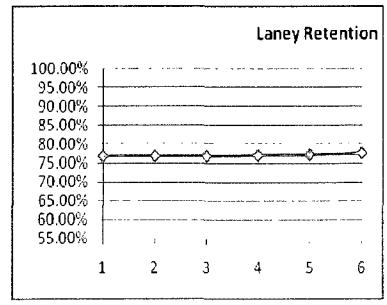
Laney Retention
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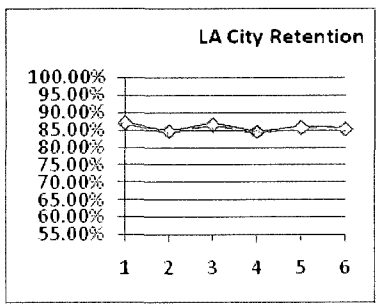
LA City Retention
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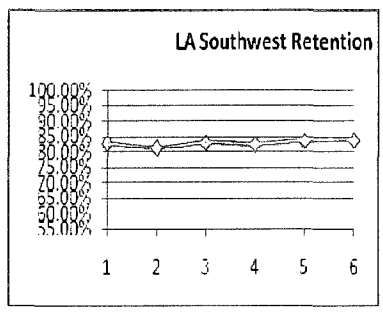
LA Southwest Retention
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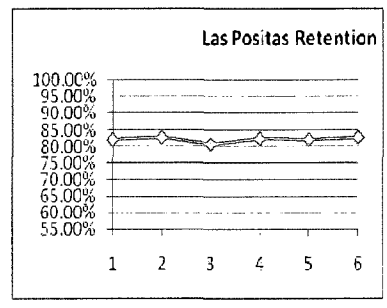
Las Positas Retention
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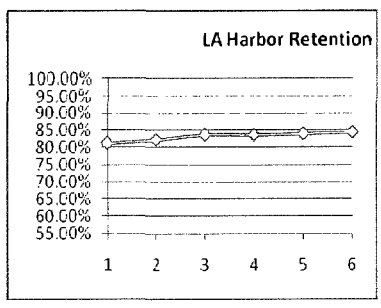
LA Harbor Retention
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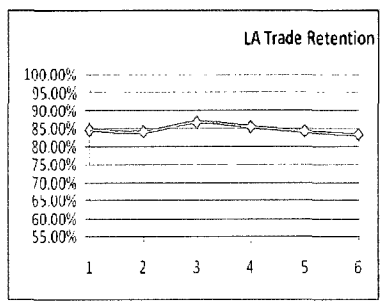
LA Trade Retention
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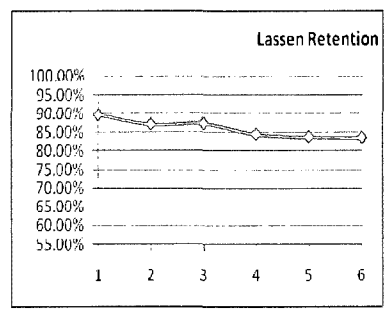
Lassen Retention
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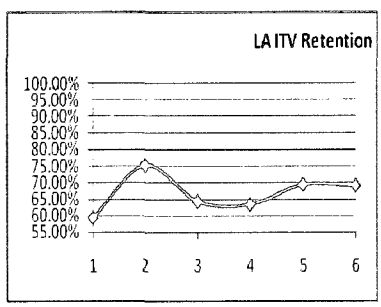
LA ITV Retention
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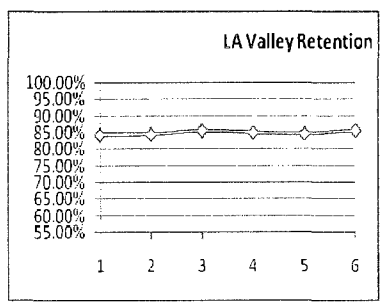
LA Valley Retention
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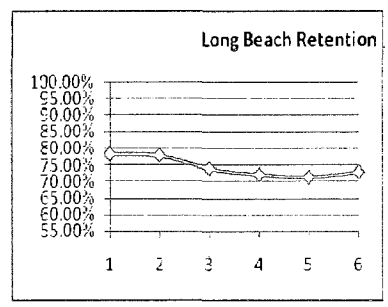
Long Beach Retention
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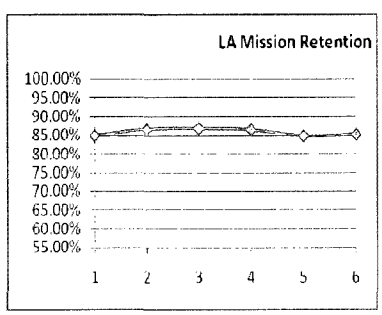
LA Mission Retention
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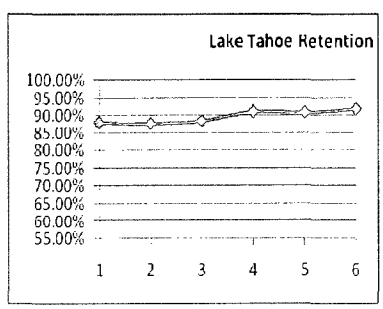
Lake Tahoe Retention
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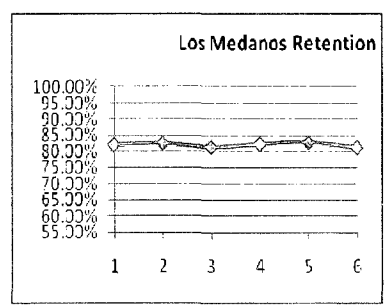
Los Medanos Retention
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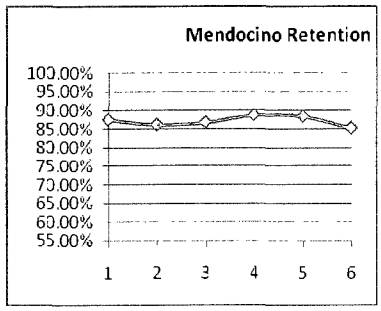
Mendocino Retention
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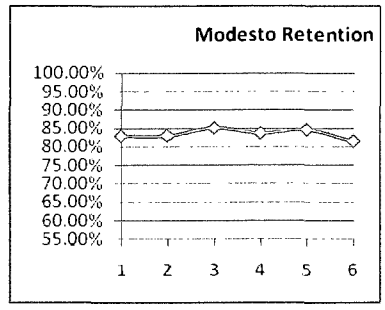
Modesto Retention
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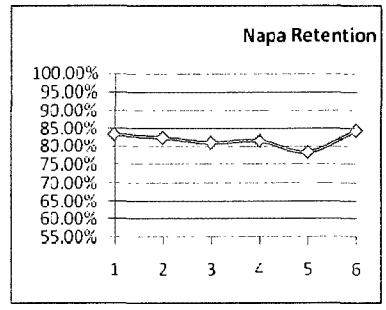
Napa Retention
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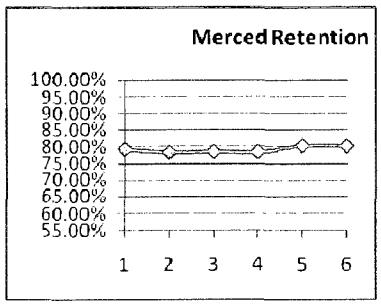
Merced Retention
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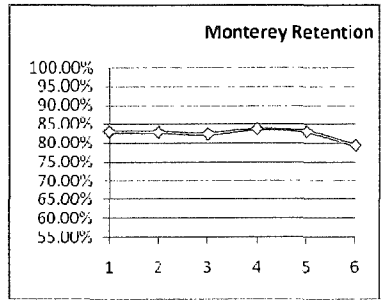
Monterey Retention
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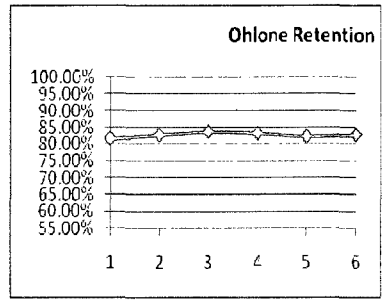
Ohlone Retention
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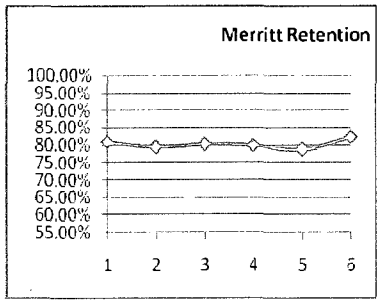
Merritt Retention
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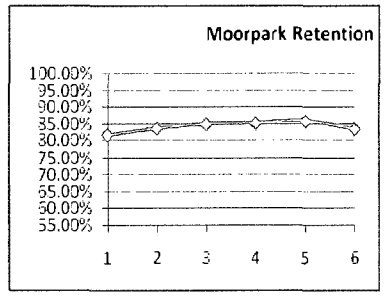
Moorpark Retention
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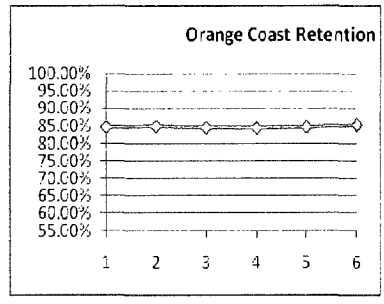
Orange Coast Retention
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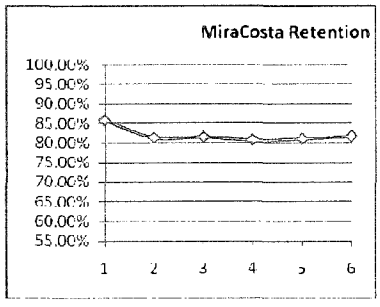
MiraCosta Retention
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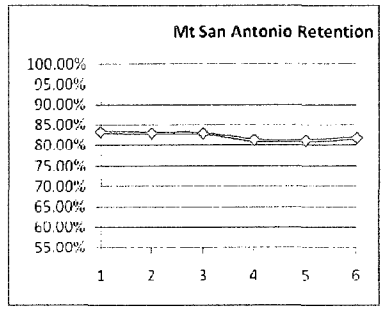
Mt San Antonio Retention
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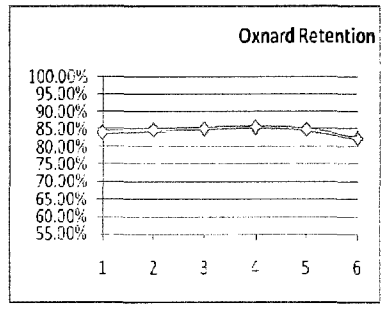
Oxnard Retention
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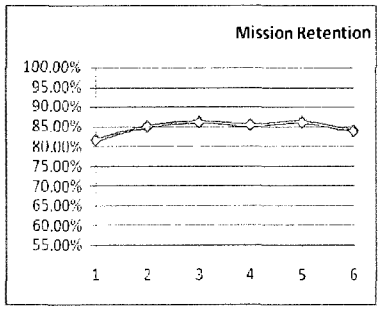
Mission Retention
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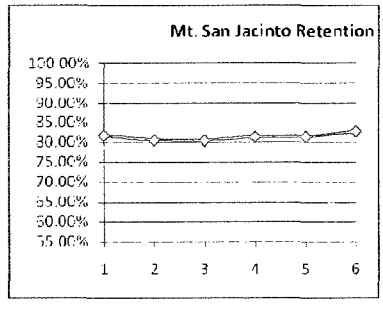
Mt. San Jacinto Retention
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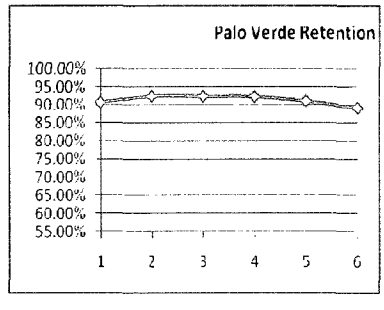
Palo Verde Retention
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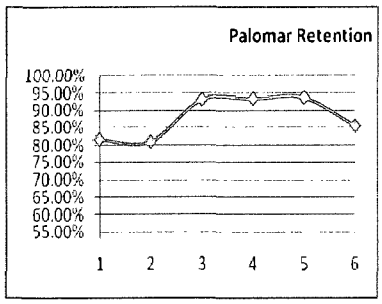
Palomar Retention
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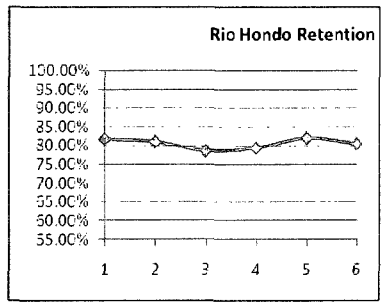
Rio Hondo Retention
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95.00%
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85.00%
80.00%
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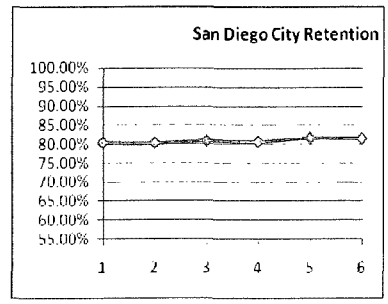
1 2 3 4 5 6


San Diego City Retention
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85.00%
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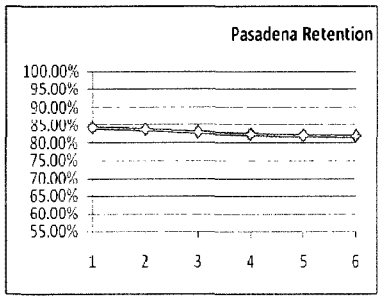
1 2 3 4 5 6


Pasadena Retention
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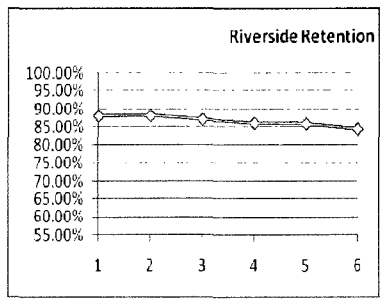
1 2 3 4 5 6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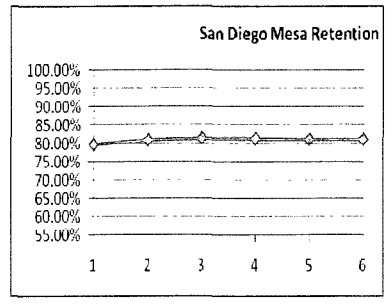
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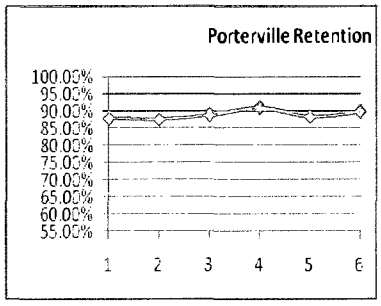
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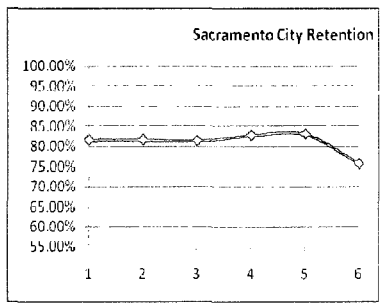
Sacramento City Retention
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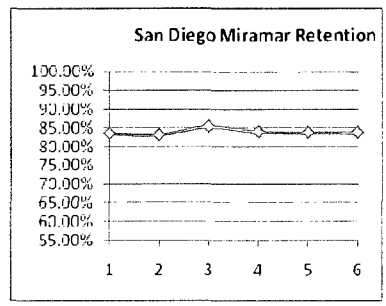
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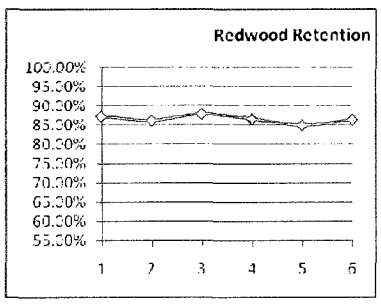
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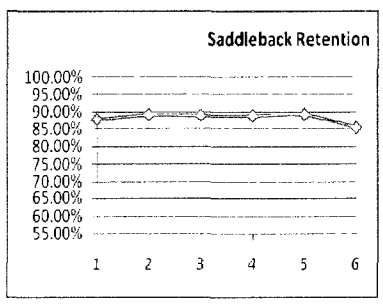
Saddleback Retention
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60.00%
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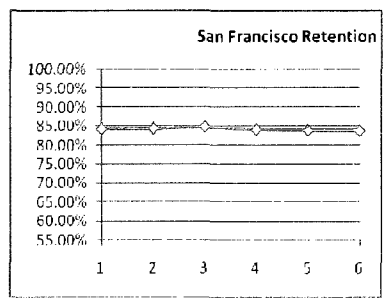
San Francisco Retention
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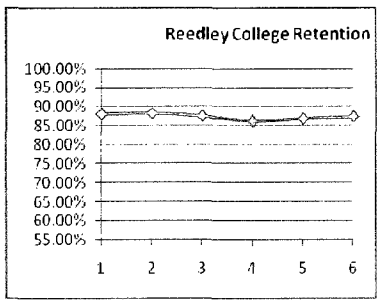
1 2 3 4 5 6


Reedley College Retention
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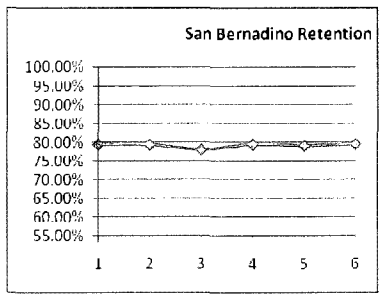
1 2 3 4 5 6


San Bernadino Retention
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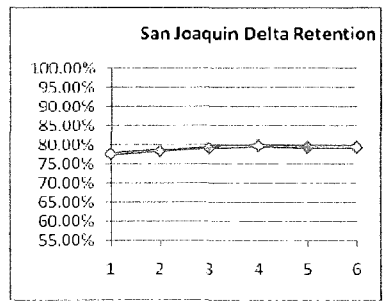
San Joaquin Delta Retention
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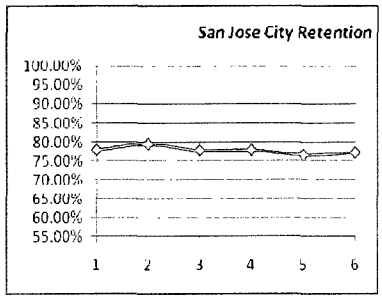
San Jose City Retention
100.00%
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85.00%
80.00%
75.00%
70.00%
65.00%
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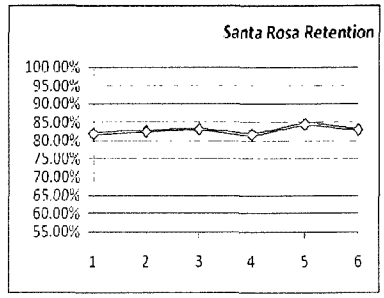
55.00%
1 2 3 4 5 6


Santa Rosa Retention
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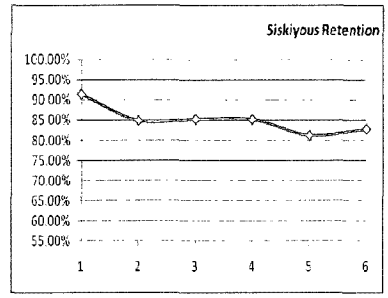
Siskiyous Retention
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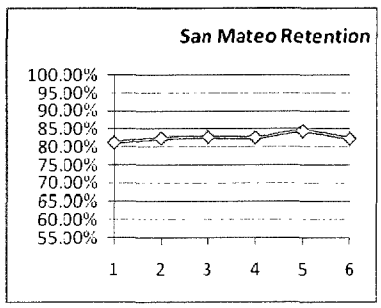
San Mateo Retention
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85.00%
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75.00%
70.00%
65.00%
60.00%
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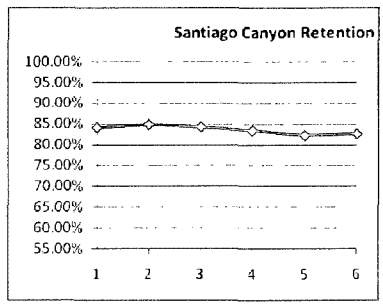
1 2 3 4 5 6


Santiago Canyon Retention
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75.00%
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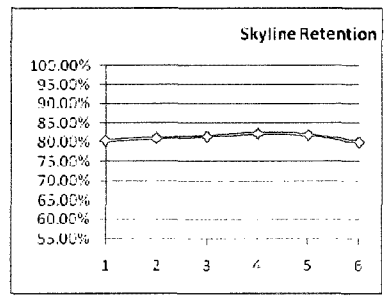
1 2 3 4 5 6


Skyline Retention
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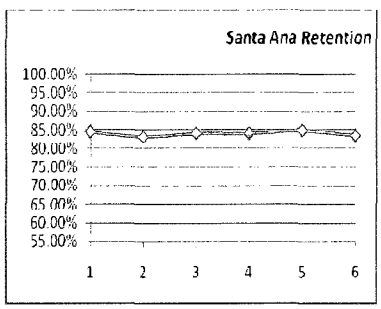
1 2 3 4 5 6


Santa Ana Retention
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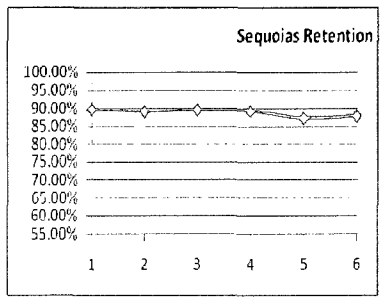
60.00%
55.00%
1 2 3 4 5 6


Sequoias Retention
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70.00%
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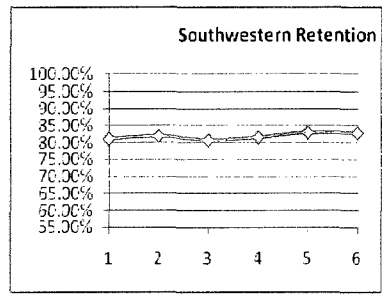
60.00%
55.00%
1 2 3 4 5 6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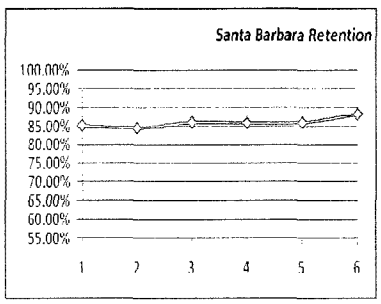
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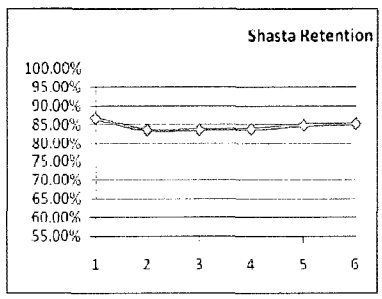
Shasta Retention
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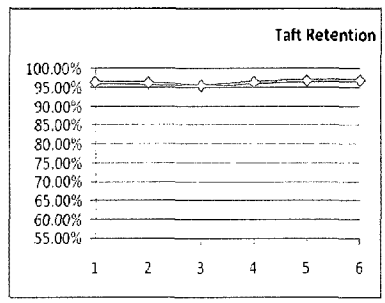
1 2 3 4 5 6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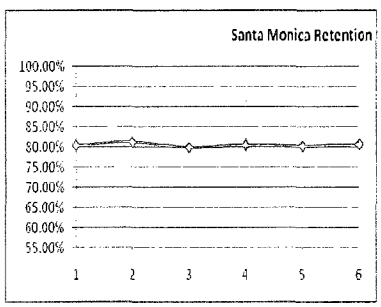
1 2 3 4 5 6


Santa Monica Retention
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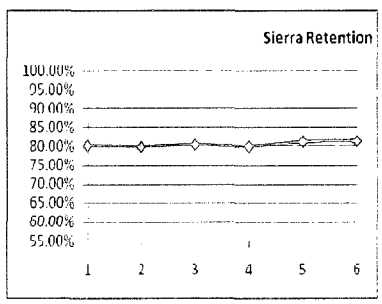
Sierra Retention
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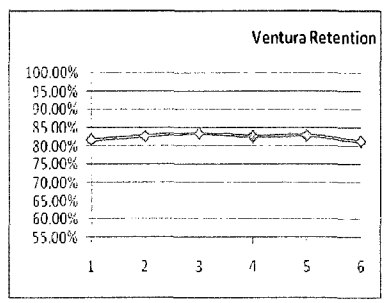
Ventura Retention
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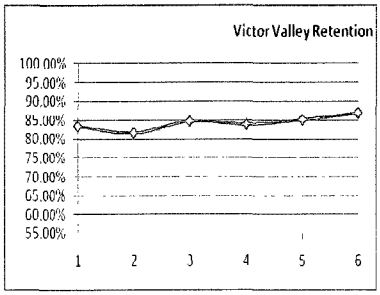
Victor Valley Retention
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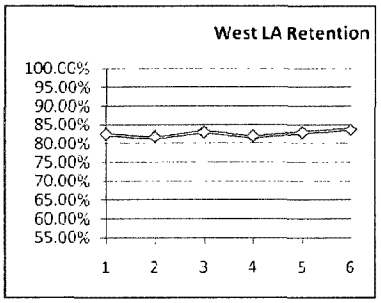
West LA Retention
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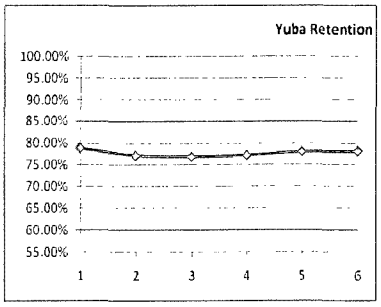
1 2 3 4 5 6


Yuba Retention
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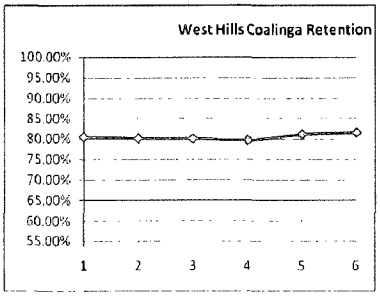
70.00%
65.00%
60.00%
55.00%
1 2 3 4 5 6


West Hills Coalinga Retention
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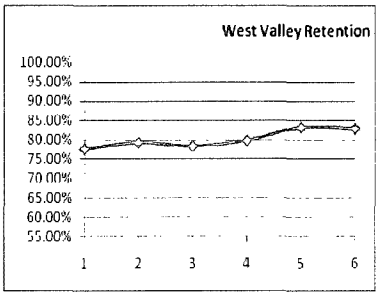
55.00%
1 2 3 4 5 6


West Valley Retention
100.00%
95.00%
90.00%
85.00%
80.00%
75.00%
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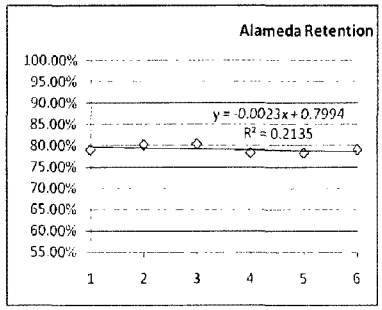
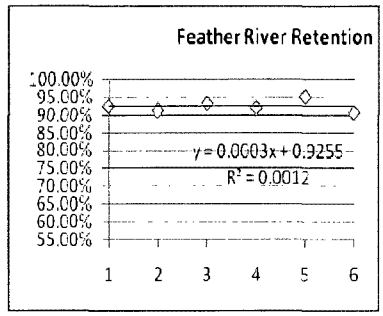
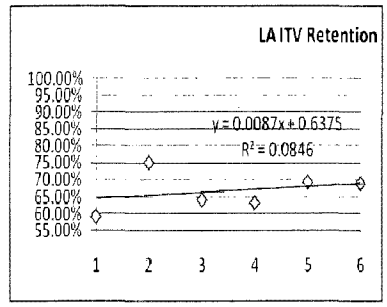
65.00%
60.00%
55.00%
1 2 3 4 5 6

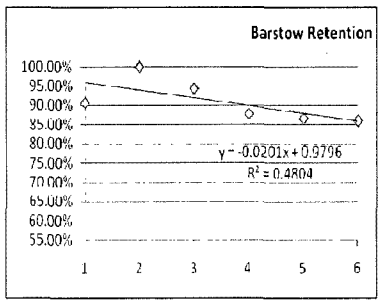
APPENDIX E

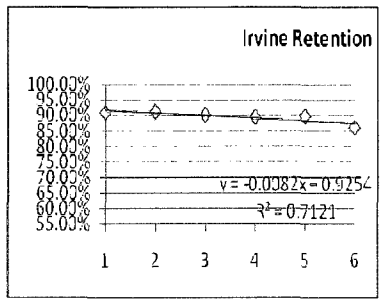
Fitted Trajectories of Non-Funded Colleges--Retention

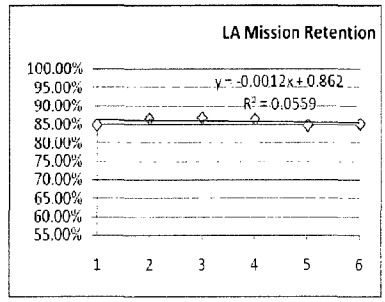


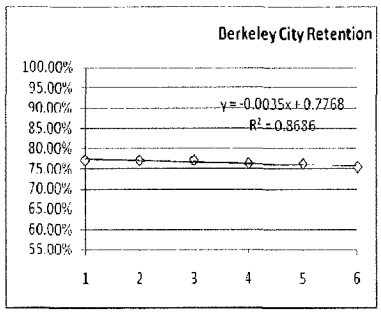


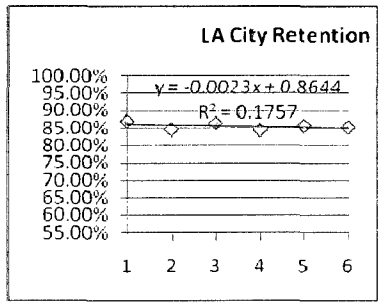


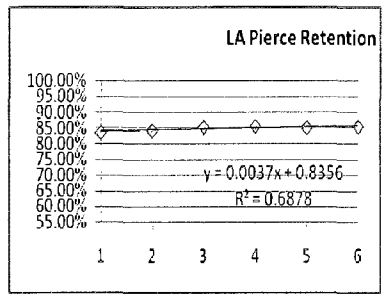


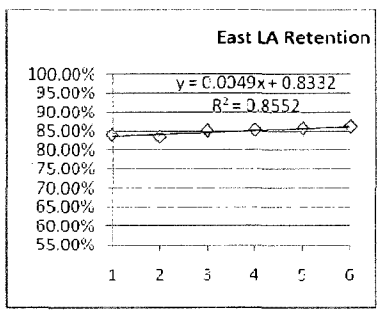


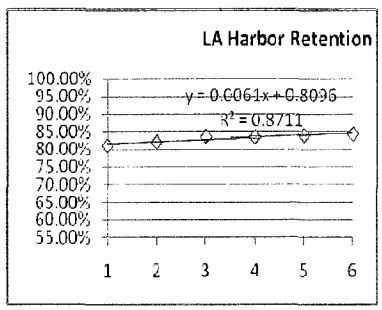


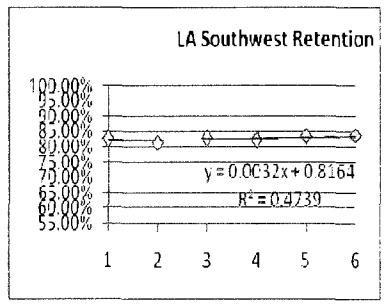


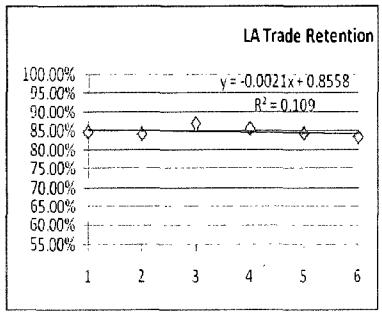


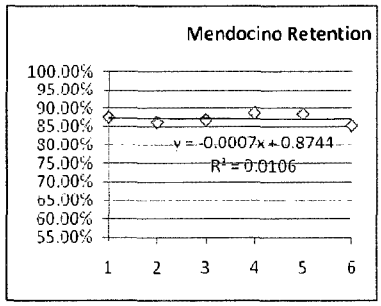


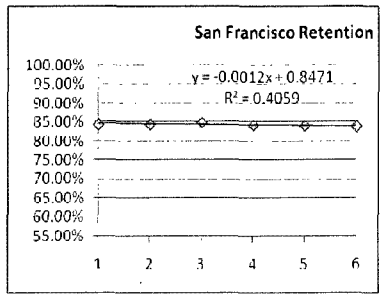


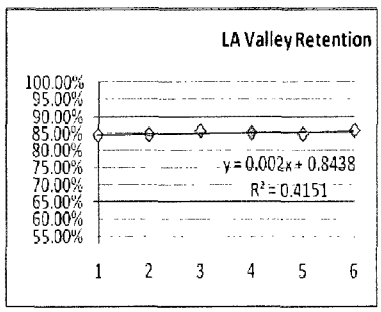


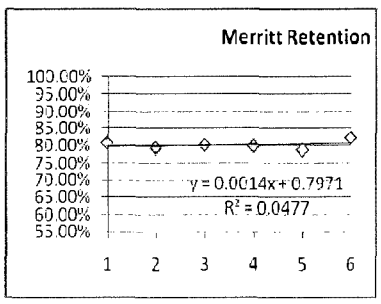


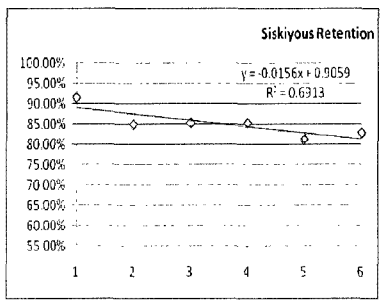

LA Trade Retention
y = -0.0021x + 0.8558
R² = 0.109

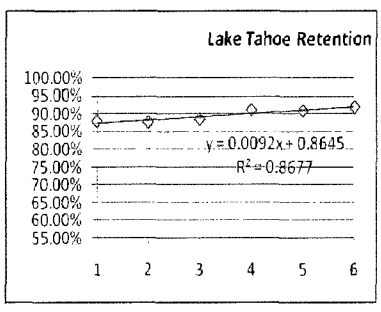

Mendocino Retention
y = -0.0007x + 0.8744
R² = 0.0106

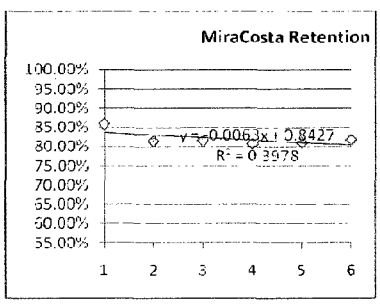

San Francisco Retention
y = -0.0012x + 0.8471
R² = 0.4059

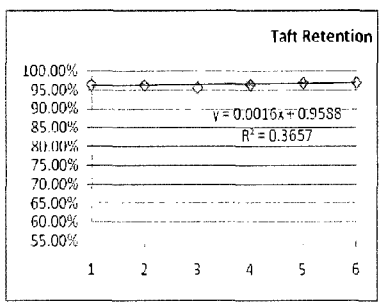

LA Valley Retention
y = 0.002x + 0.8438
R² = 0.4151

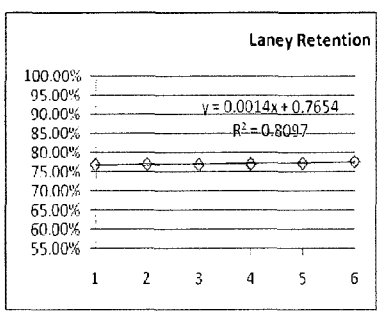

Merritt Retention
y = 0.0014x + 0.7971
R² = 0.0477

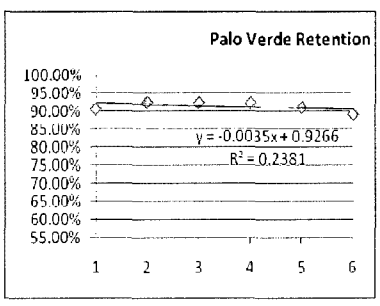

Siskiyous Retention
y = -0.0156x + 0.9059
R² = 0.6913

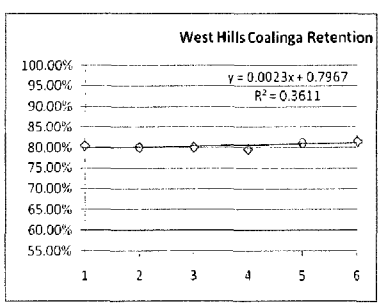

Lake Tahoe Retention
y = 0.0092x + 0.8645
R² = 0.8677

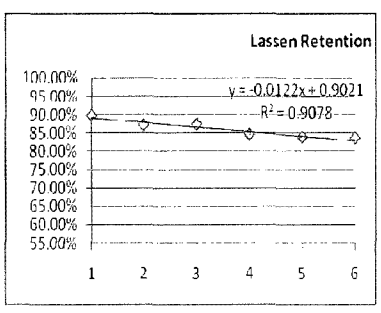

MiraCosta Retention
y = -0.0063x + 0.8427
R² = 0.3978

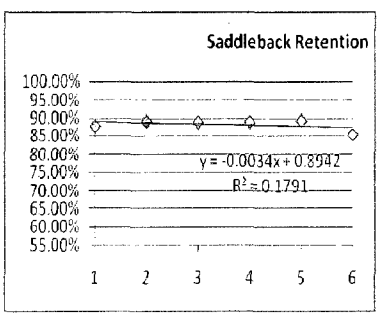

Taft Retention
y = 0.0016x + 0.9588
R² = 0.3657

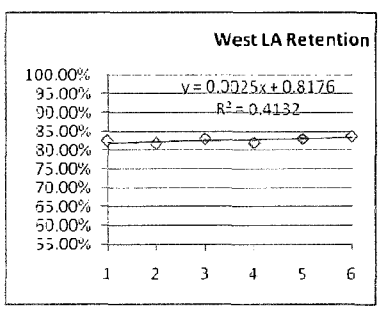

Laney Retention
y = 0.0014x + 0.7654
R² = 0.8097


Palo Verde Retention
y = -0.0035x + 0.9266
R² = 0.2381


West Hills Coalinga Retention
y = 0.0023x + 0.7967
R² = 0.3611

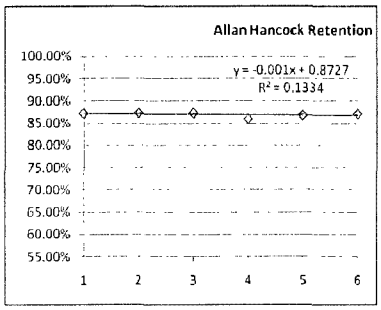

Lassen Retention
y = -0.0122x + 0.9021
R² = 0.9078

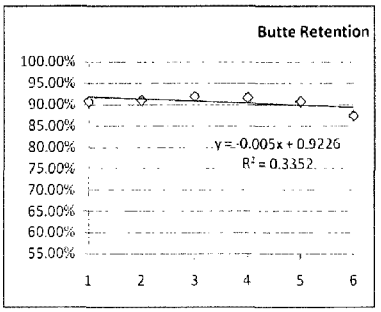

Saddleback Retention
y = -0.0034x + 0.8942
R² = 0.1791

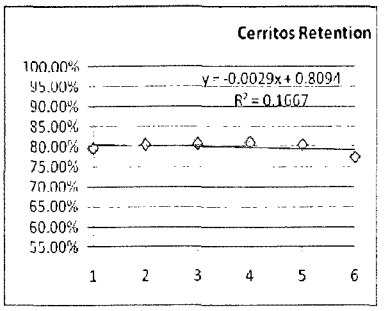

West LA Retention
y = 0.0025x + 0.8176
R² = 0.4132

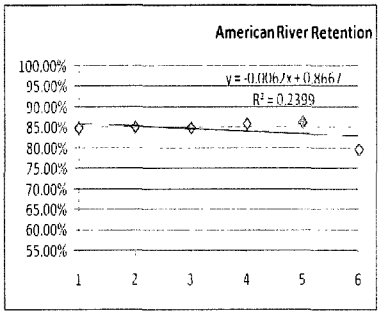
APPENDIX F

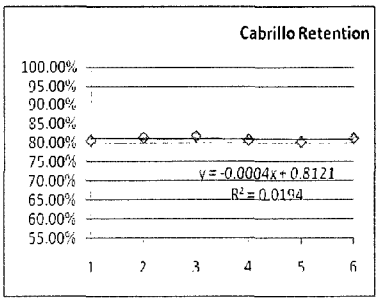
Fitted Trajectories of Funded Colleges--Retention

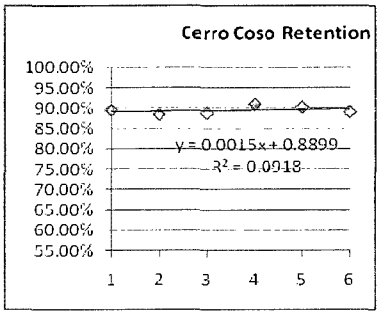


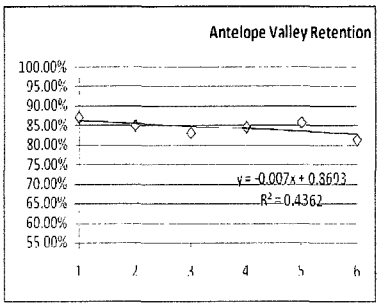


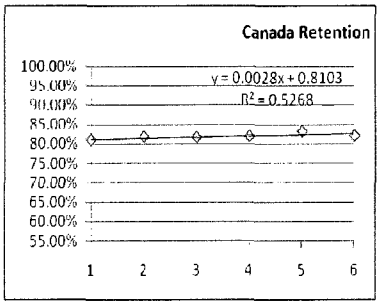


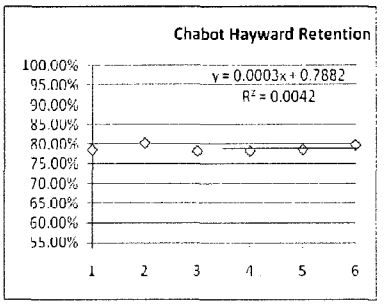


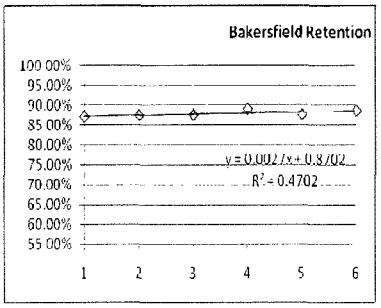


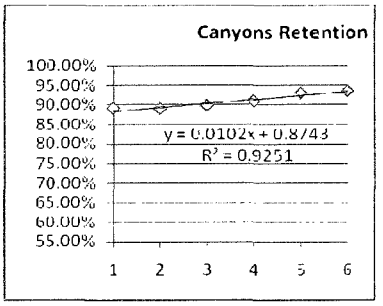


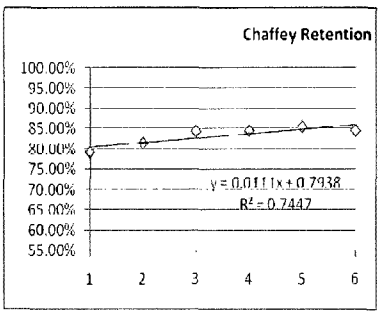


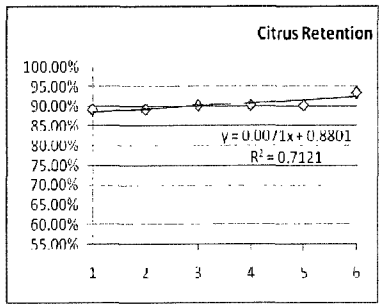


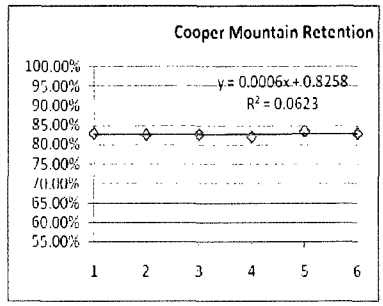


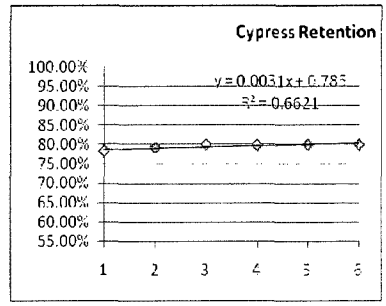


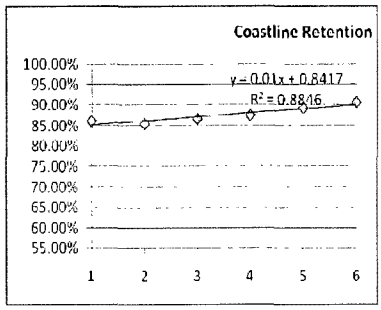


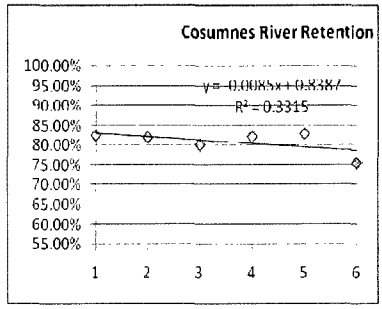


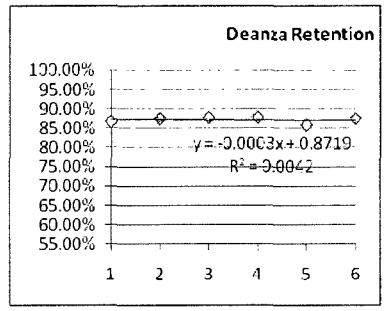

Citrus Retention
y = 0.0071x + 0.8801
R² = 0.7121

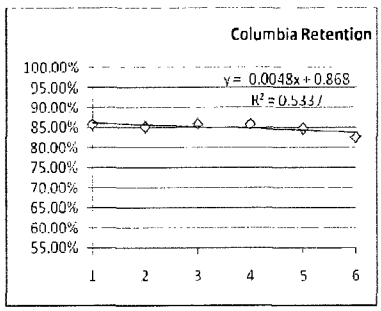

Cooper Mountain Retention
y = 0.0006x + 0.8258
R² = 0.0623

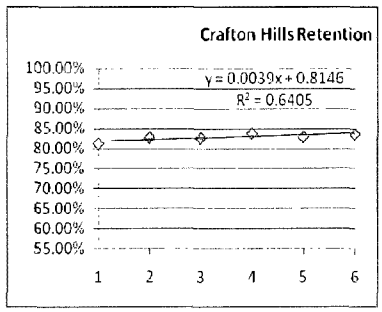

Cypress Retention
y = 0.0031x + 0.785
R² = 0.6621

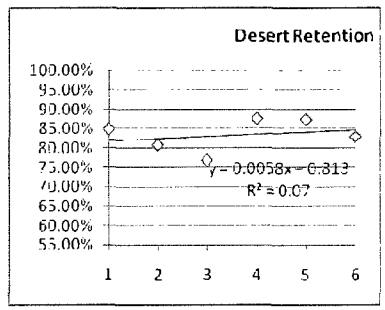

Coastline Retention
y = 0.01x + 0.8417
R² = 0.8846

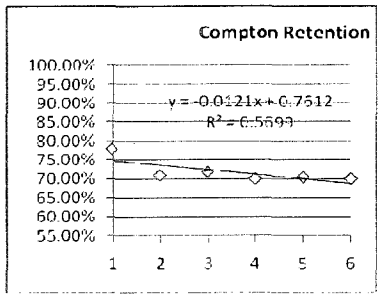

Cosumnes River Retention
y = -0.0085x + 0.8387
R² = 0.3315

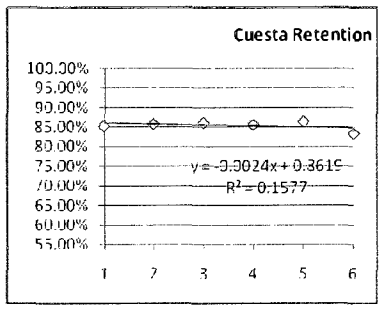

Deanza Retention
y = -0.0003x + 0.8719
R² = 0.0042

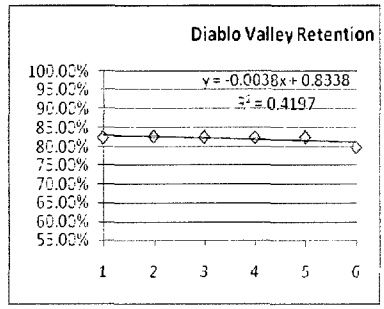

Columbia Retention
y = -0.0048x + 0.868
R² = 0.5337

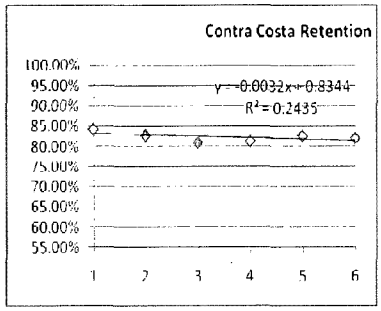

Crafton Hills Retention
y = 0.0039x + 0.8146
R² = 0.6405

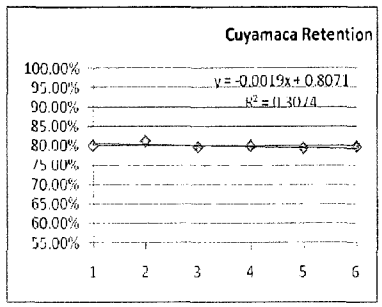

Desert Retention
y = 0.0058x + 0.813
R² = 0.07

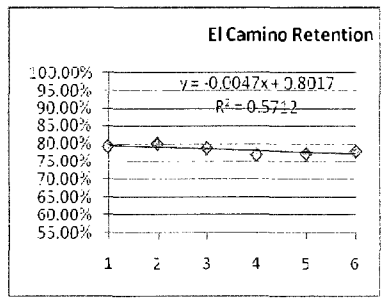

Compton Retention
y = -0.0121x + 0.7512
R² = 0.5593

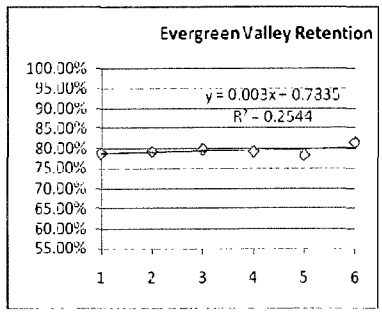

Cuesta Retention
y = -0.0024x + 0.8615
R² = 0.1577

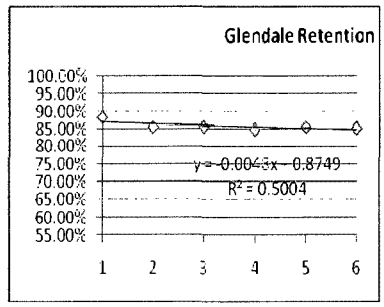

Diablo Valley Retention
y = -0.0038x + 0.8338
R² = 0.4197

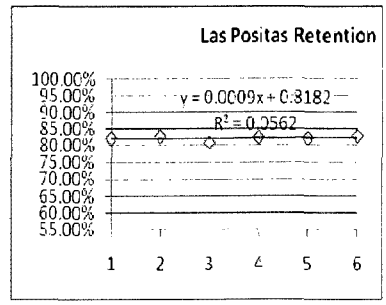

Contra Costa Retention
y = -0.0032x + 0.8344
R² = 0.2435

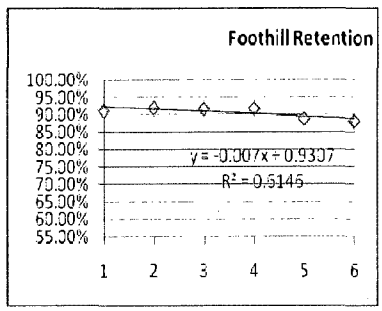

Cuyamaca Retention
y = -0.0019x + 0.8071
R² = 0.3074

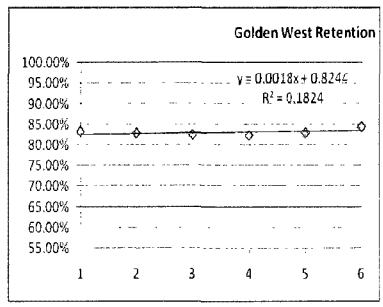

El Camino Retention
y = -0.0047x + 0.8017
R² = 0.5712

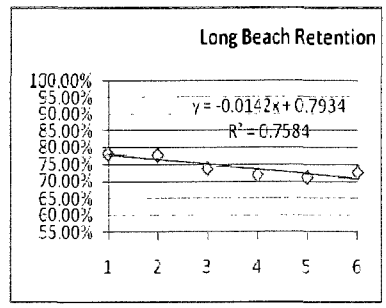

Evergreen Valley Retention
y = 0.003x + 0.7335
R² = 0.2544

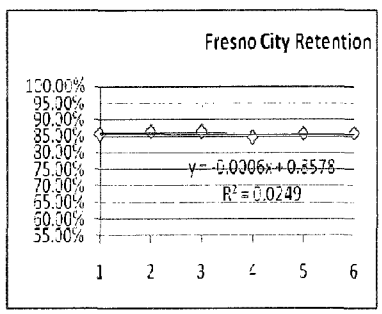

Glendale Retention
y = -0.0043x + 0.8749
R² = 0.5004

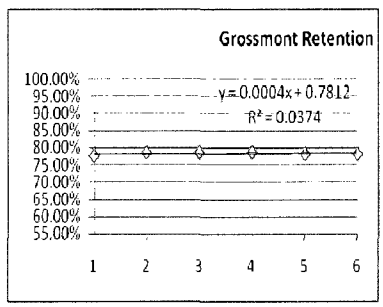

Las Positas Retention
y = 0.0009x + 0.8182
R² = 0.0562

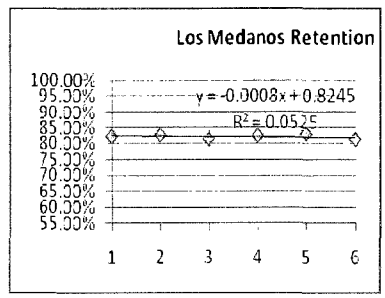

Foothill Retention
y = -0.007x + 0.9307
R² = 0.5145

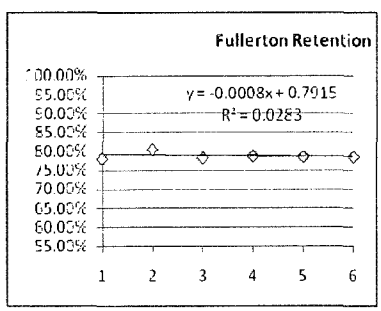

Golden West Retention
y = 0.0018x + 0.8246
R² = 0.1824

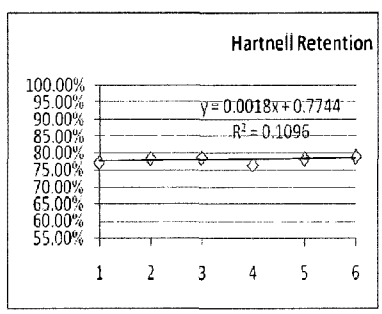

Long Beach Retention
y = -0.0142x + 0.7934
R² = 0.7584

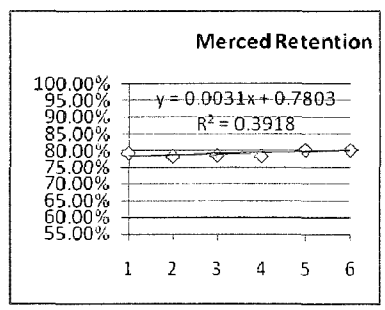

Fresno City Retention
y = -0.0006x + 0.8578
R² = 0.0249

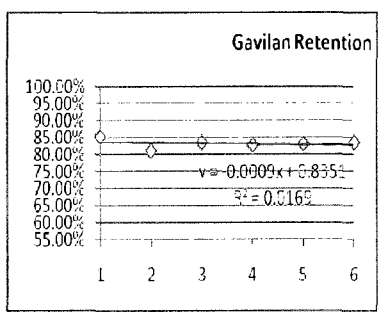

Grossmont Retention
y = 0.0004x + 0.7812
R² = 0.0374

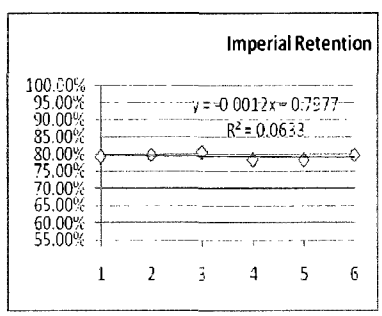

Los Medanos Retention
y = -0.0008x + 0.8245
R² = 0.0525

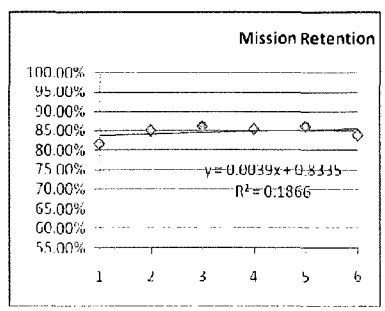

Fullerton Retention
y = -0.0008x + 0.7915
R² = 0.0283

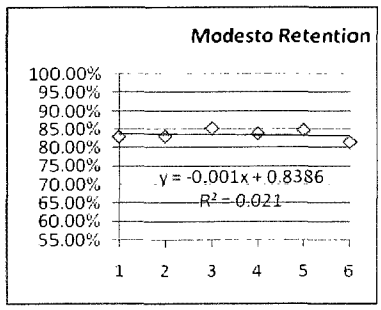

Hartnell Retention
y = 0.0018x + 0.7744
R² = 0.1096

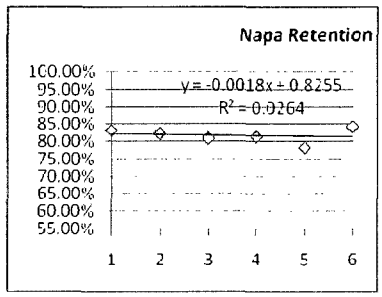

Merced Retention
y = 0.0031x + 0.7803
R² = 0.3918

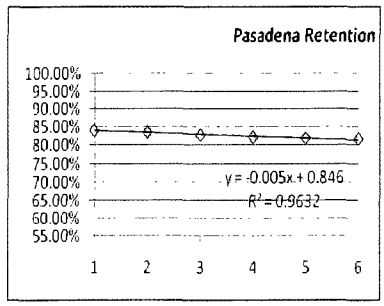

Gavilan Retention
y = 0.0009x + 0.8352
R² = 0.0169

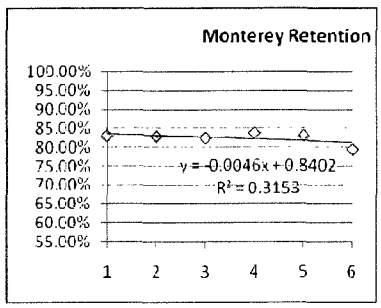

Imperial Retention
y = -0.0012x + 0.7877
R² = 0.0633

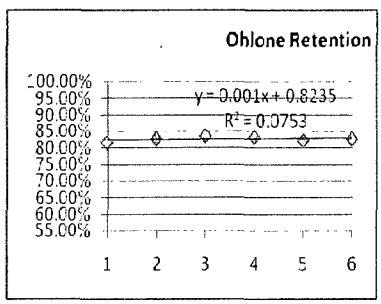

Mission Retention
y = 0.0039x + 0.8345
R² = 0.1866

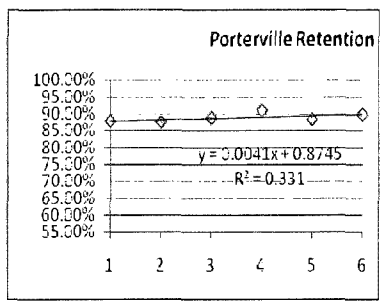

Modesto Retention
y = -0.001x + 0.8386
R² = 0.021

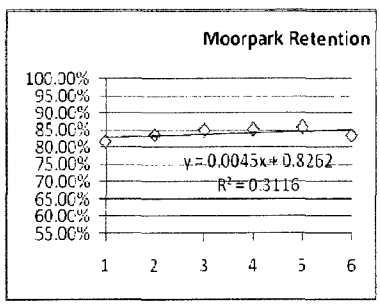

Napa Retention
y = -0.0018x + 0.8255
R² = 0.0264

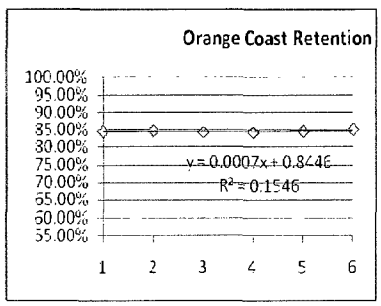

Pasadena Retention
y = -0.005x + 0.846
R² = 0.9632

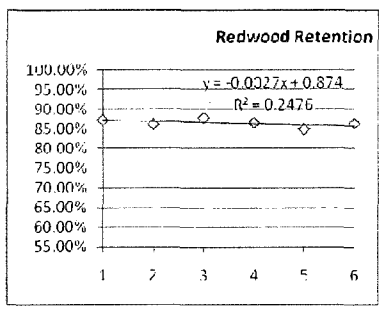

Monterey Retention
y = -0.0046x + 0.8402
R² = 0.3153

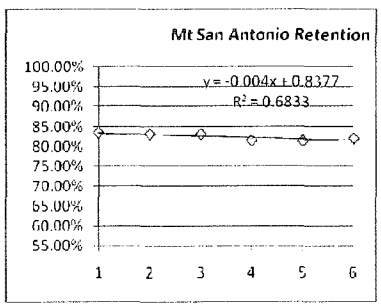

Ohlone Retention
y = 0.001x + 0.8235
R² = 0.0753

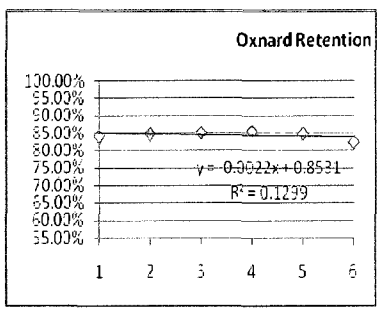

Porterville Retention
y = 0.0041x + 0.8745
R² = 0.331

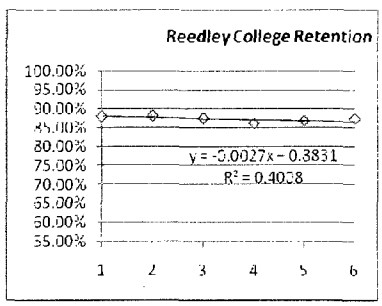

Moorpark Retention
y = 0.0045x + 0.8262
R² = 0.3116

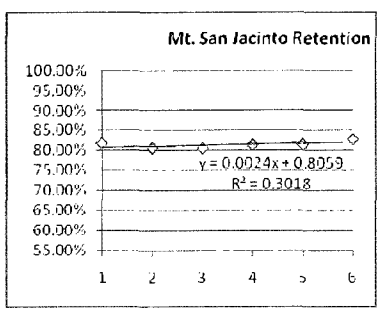

Orange Coast Retention
y = 0.0007x + 0.8446
R² = 0.1546

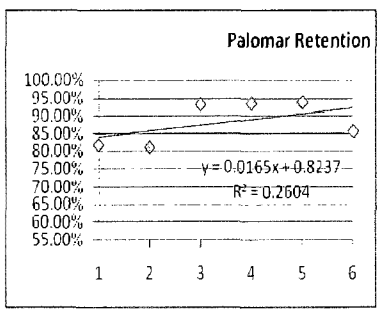

Redwood Retention
y = -0.0027x + 0.874
R² = 0.2476

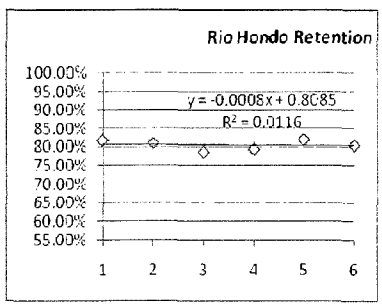

Mt San Antonio Retention
y = -0.004x + 0.8377
R² = 0.6833

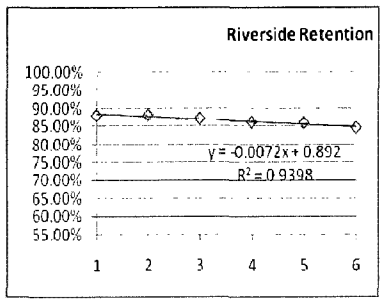

Oxnard Retention
y = 0.0022x + 0.8531
R² = 0.1239

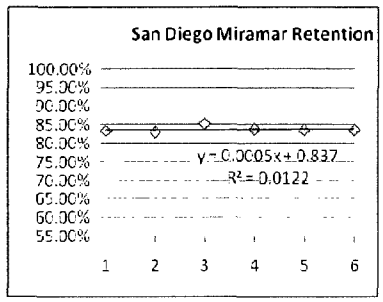

Reedley College Retention
y = -0.0027x + 0.8831
R² = 0.4008

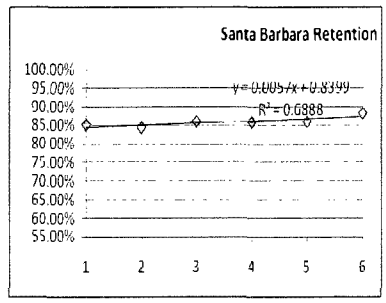

Mt. San Jacinto Retention
y = 0.0024x + 0.8059
R² = 0.3018

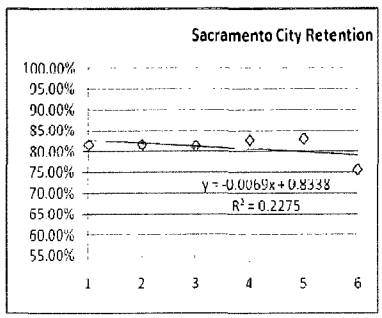

Palomar Retention
y = 0.0165x + 0.8237
R² = 0.2604

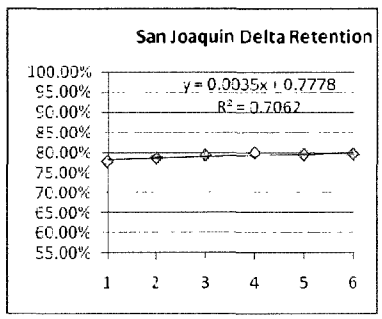

Rio Hondo Retention
y = -0.0008x + 0.8085
R² = 0.0116

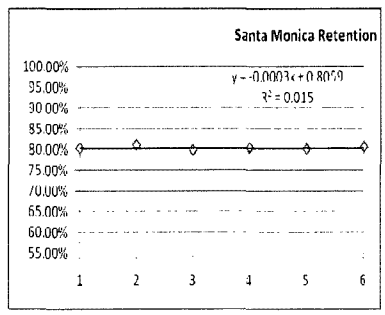

Riverside Retention
y = -0.0072x + 0.892
R² = 0.9398

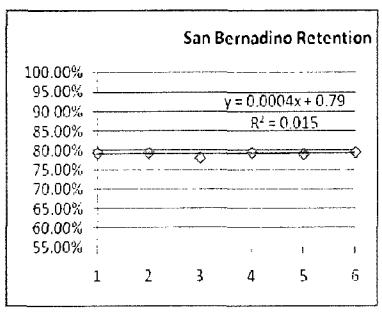

San Diego Miramar Retention
y = -0.0005x + 0.837
R² = 0.0122

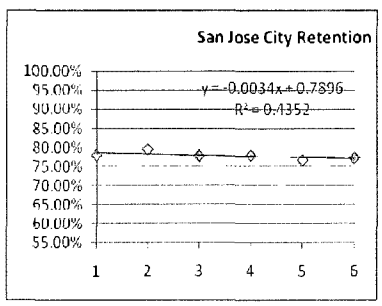

Santa Barbara Retention
y = 0.0057x + 0.8399
R² = 0.6888

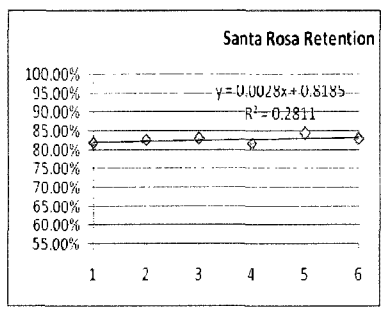

Sacramento City Retention
y = -0.0069x + 0.8338
R² = 0.2275

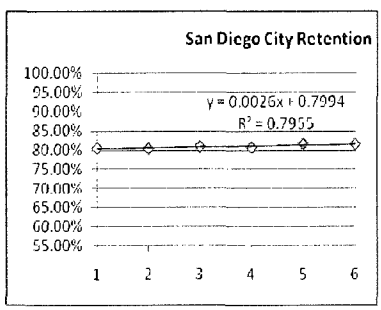

San Joaquin Delta Retention
y = 0.0035x + 0.7778
R² = 0.7062

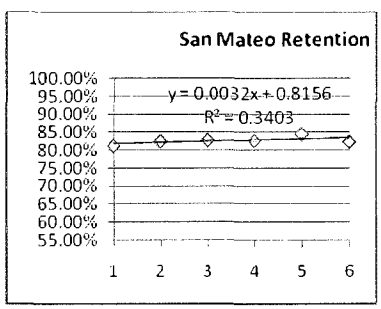

Santa Monica Retention
y = -0.0003x + 0.8059
R² = 0.015

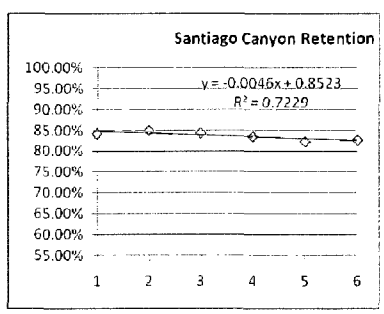

San Bernadino Retention
y = 0.0004x + 0.79
R² = 0.015

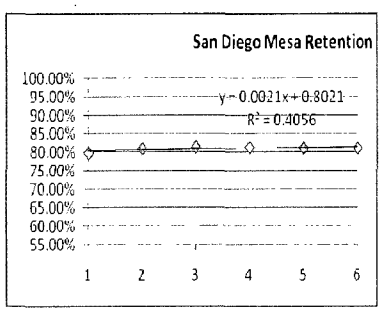

San Jose City Retention
y = -0.0034x + 0.7896
R² = 0.4352

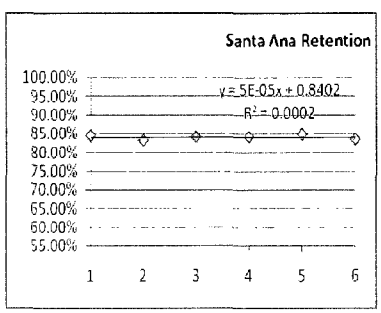

Santa Rosa Retention
y = 0.0028x + 0.8185
R² = 0.2811

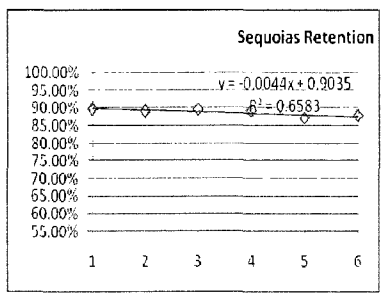

San Diego City Retention
y = 0.0026x + 0.7994
R² = 0.7955

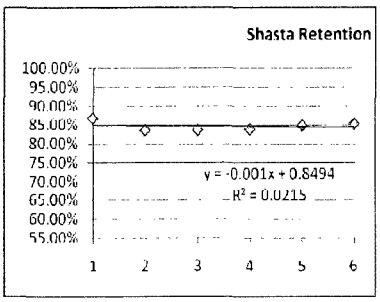

San Mateo Retention
y = 0.0032x + 0.8156
R² = 0.3403

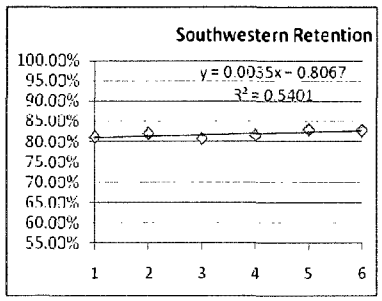

Santiago Canyon Retention
y = -0.0046x + 0.8523
R² = 0.7229

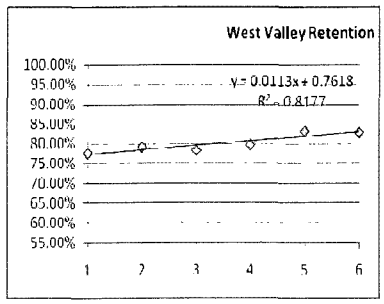

San Diego Mesa Retention
y = 0.0021x + 0.8021
R² = 0.4056

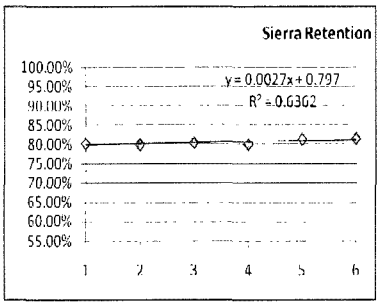

Santa Ana Retention
y = 5E-05x + 0.8402
R² = 0.0002

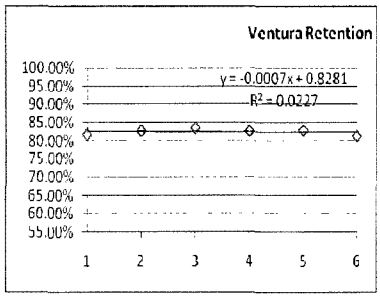

Sequoias Retention
y = -0.0044x + 0.9035
R² = 0.6583

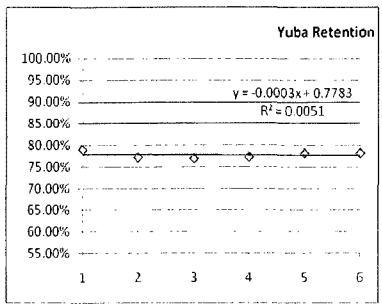

Shasta Retention
100.00%
95.00%
90.00%
85.00%
80.00%
75.00%
70.00%
65.00%
60.00%
55.00%
y = -0.001x + 0.8494
R² = 0.0215
1 2 3 4 5 6

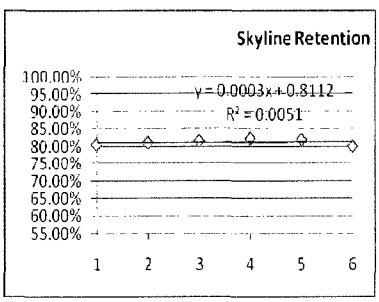

Southwestern Retention
y = 0.0035x - 0.8067
R² = 0.5401
100.00%
95.00%
90.00%
85.00%
80.00%
75.00%
70.00%
65.00%
60.00%
55.00%
1 2 3 4 5 6

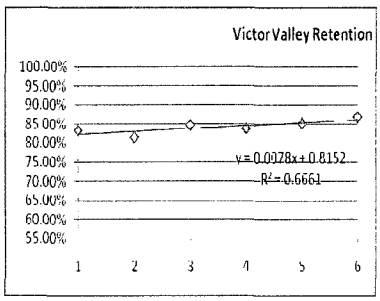

West Valley Retention
y = 0.0113x + 0.7618
R² = 0.8177
100.00%
95.00%
90.00%
85.00%
80.00%
75.00%
70.00%
65.00%
60.00%
55.00%
1 2 3 4 5 6


Sierra Retention
y = 0.0027x + 0.797
R² = 0.0302
100.00%
95.00%
90.00%
85.00%
80.00%
75.00%
70.00%
65.00%
60.00%
55.00%
1 2 3 4 5 6


Ventura Retention
y = -0.0007x + 0.8281
R² = 0.0227
100.00%
95.00%
90.00%
85.00%
80.00%
75.00%
70.00%
65.00%
60.00%
55.00%
1 2 3 4 5 6


Yuba Retention
y = -0.0003x + 0.7783
R² = 0.0051
100.00%
95.00%
90.00%
85.00%
80.00%
75.00%
70.00%
65.00%
60.00%
55.00%
1 2 3 4 5 6

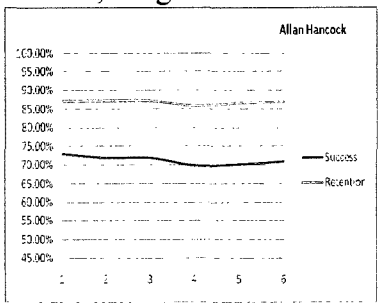

Skyline Retention
y = 0.0003x + 0.8112
R² = 0.0051
100.00%
95.00%
90.00%
85.00%
80.00%
75.00%
70.00%
65.00%
60.00%
55.00%
1 2 3 4 5 6


Victor Valley Retention
y = 0.0078x + 0.8152
R² = 0.6661
100.00%
95.00%
90.00%
85.00%
80.00%
75.00%
70.00%
65.00%
60.00%
55.00%
1 2 3 4 5 6

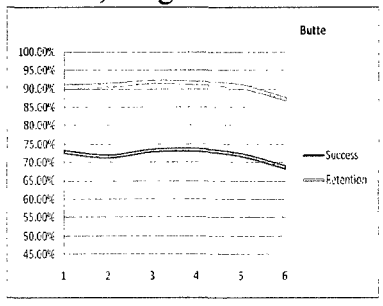
APPENDIX G

College Success and Retention on Same Graph by District

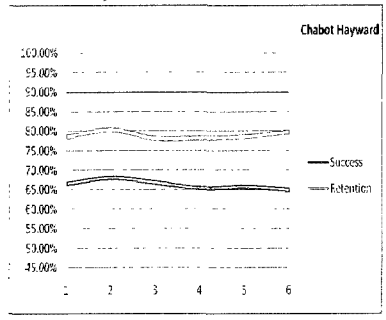
District: Allan Hancock
College: Allan Hancock
Funded; Single



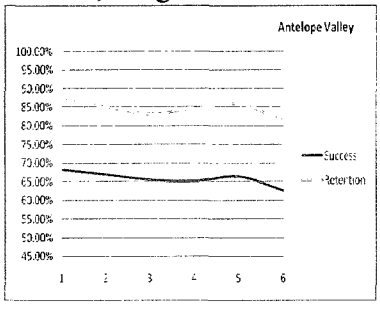
District: Butte
College: Butte
Funded; Single



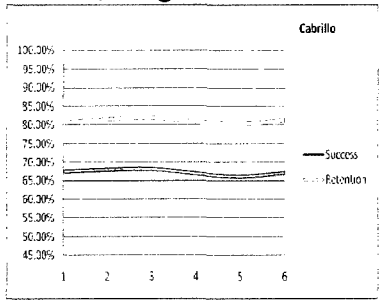
District: Chabot-Los Positas
Colleges: Chabot Hayward and Las Positas
Funded; Multi

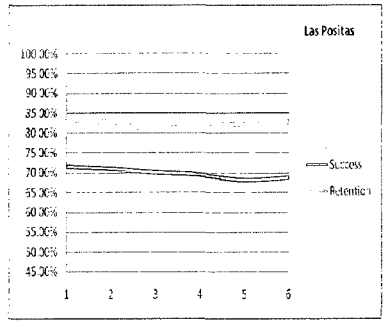


District: Antelope Valley
College: Antelope Valley
Funded; Single

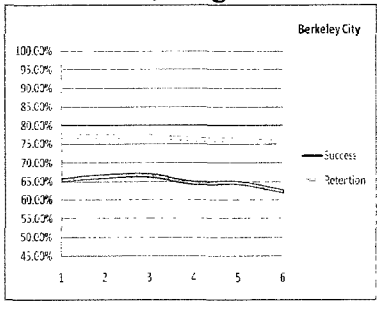


District: Cabrillo
College: Cabrillo
Funded; Single

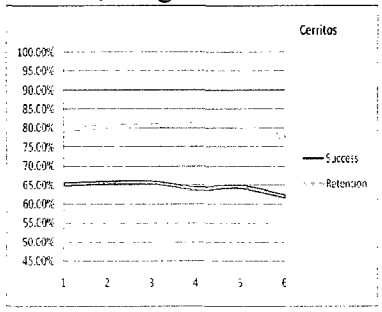




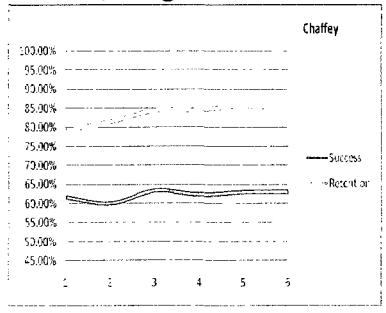
District: Barstow
College: Barstow
Not Funded; Single



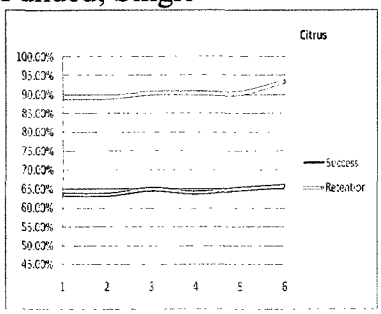
District: Cerritos
College: Cerritos
Funded; Single



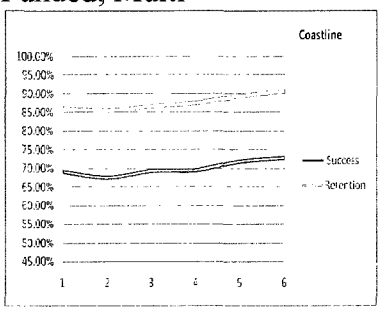
District: Chaffey
College: Chaffey
Funded; Single

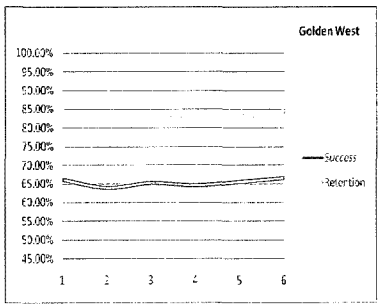


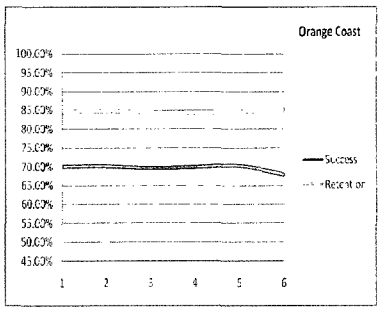
District: Citrus
College: Chaffey
Funded; Single



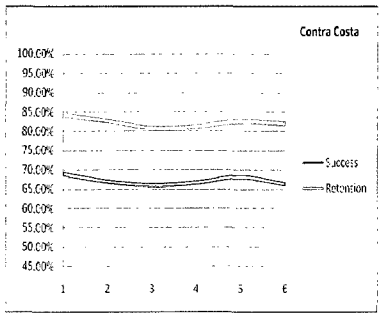
District: Coast
Colleges: Coastline, Golden West, Orange Coast
Funded; Multi

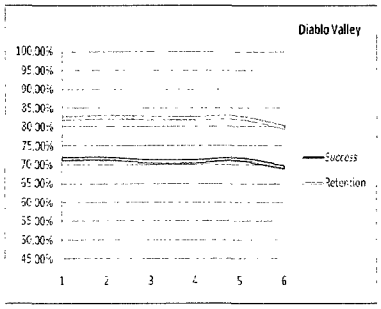


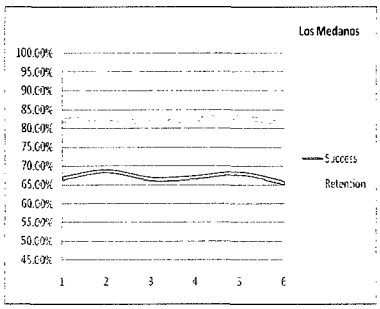




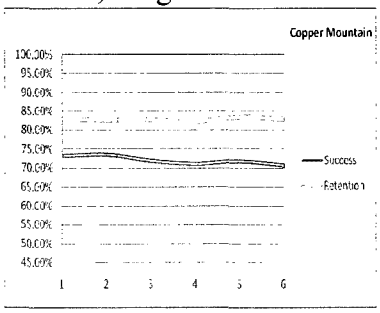
District: Contra Costa
Colleges: Contra Costa, Diablo Valley, Los Medanos
Funded; Multi



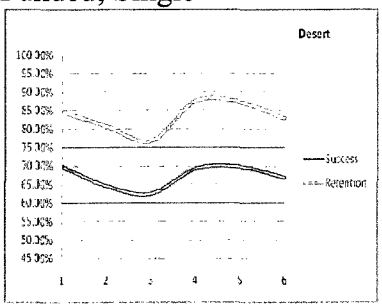




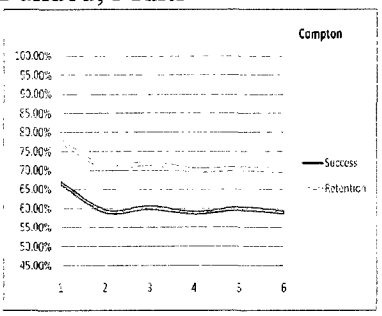
District: Copper Mountain
College: Copper Mountain
Funded; Single

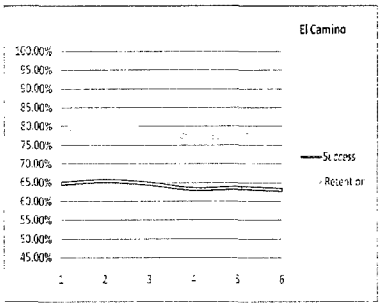


District: Desert
College: Desert
Funded; Single

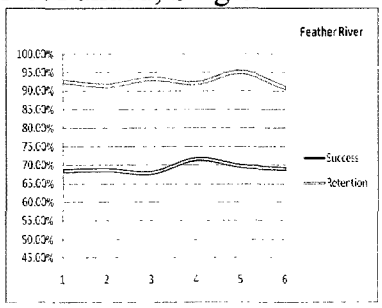


District: El Camino
Colleges: Compton and El Camino
Funded; Multi

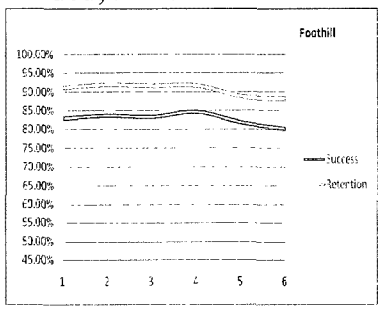


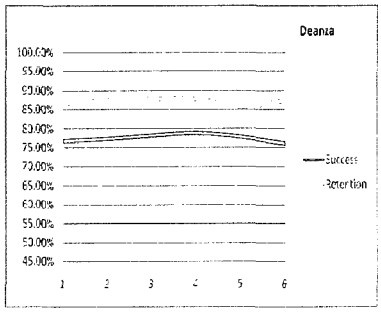


District: Feather River
College: Feather River
Not Funded; Single

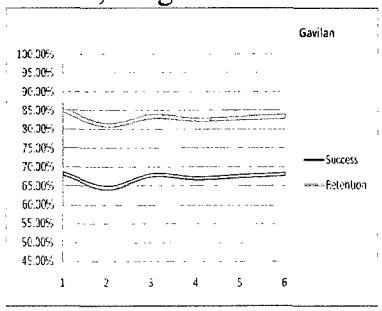


District: Foothill-Deanza
Colleges: Deanza and Foothill
Funded; Multi

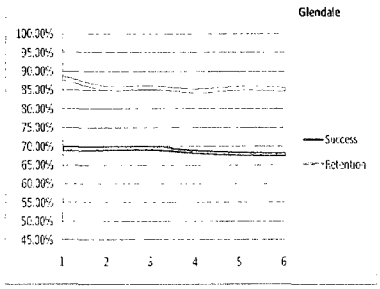




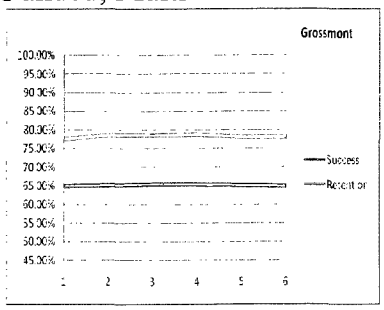
District: Gavilan
College: Gavilan
Funded; Single

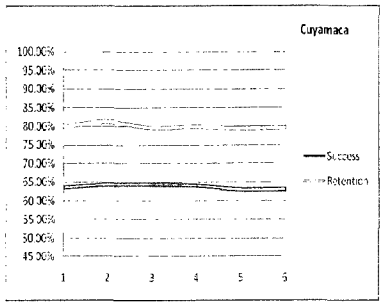


District: Glendale
College: Glendale
Funded; Single

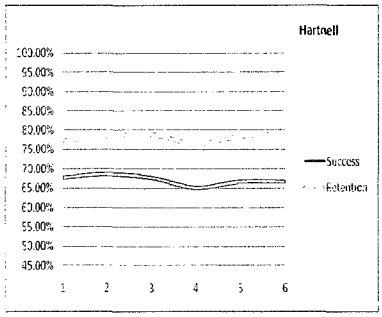


District: Grossmont-Cuyamaca
Colleges: Grossmont and Cuyamaca
Funded; Multi

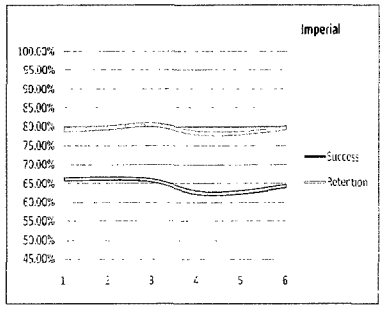




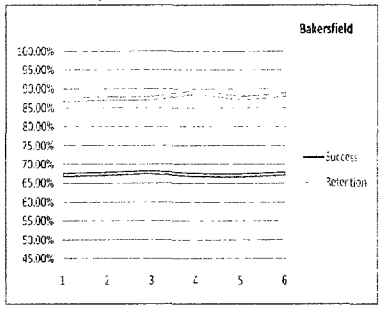
District: Hartnell
College: Hartnell
Funded; Single

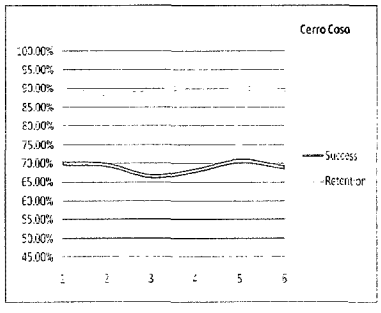


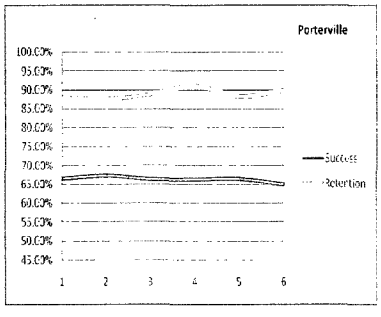
District: Imperial
College: Imperial
Funded; Single



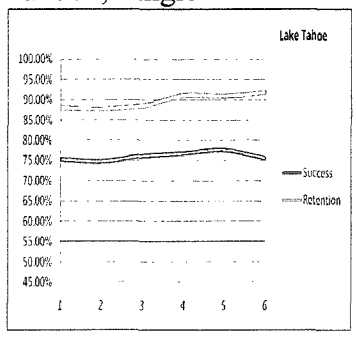
District: Kern
Colleges: Bakersfield, Cerro Coso, Porterville
Funded; Multi



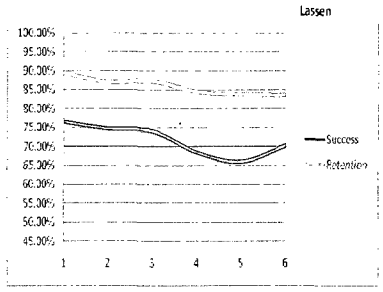




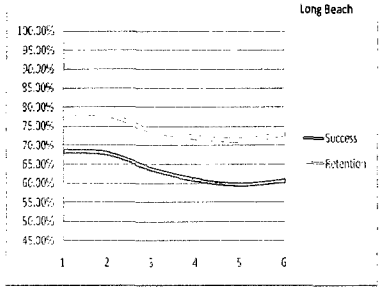
District: Lake Tahoe
College: Lake Tahoe
Funded; Single



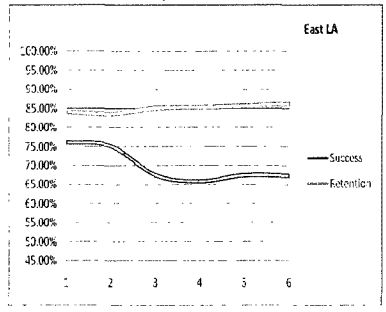
District: Lassen
College: Lassen
Not-Funded; Single

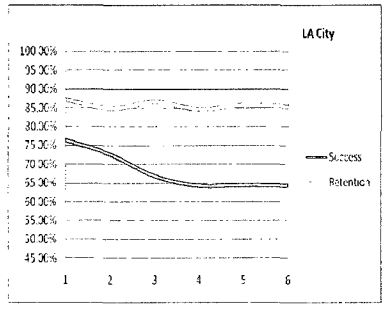


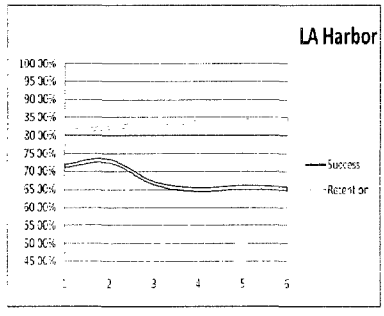
District: Long Beach
College: Long Beach
Funded; Single

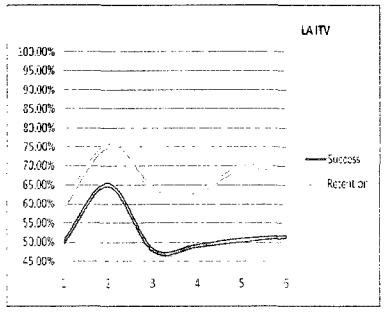


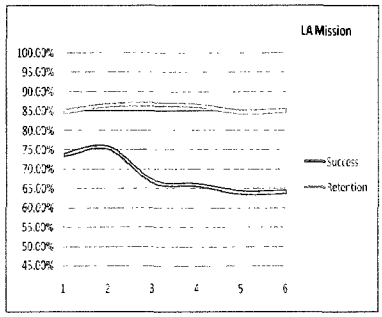
District: Los Angeles
Colleges: East L.A., L.A. City, L.A. Harbor, L.A. ITV, L.A. Mission, L.A. Pierce, L.A. Southwest, L.A. Trade, L.A. Valley, West L.A.
Not-Funded; Multi

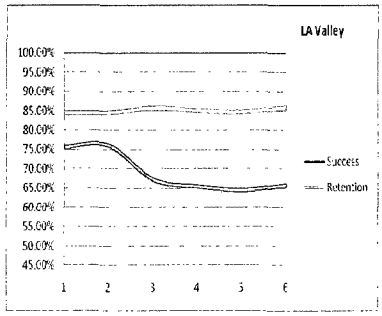








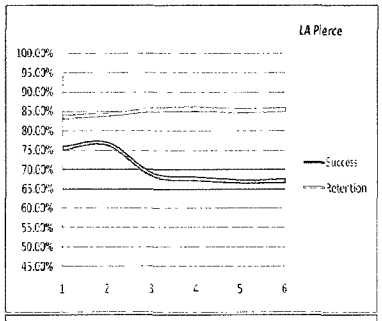


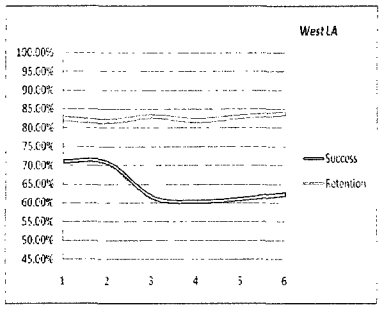


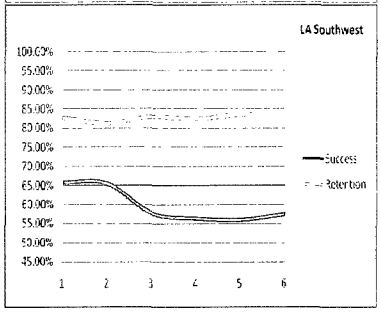
District: Los Rios

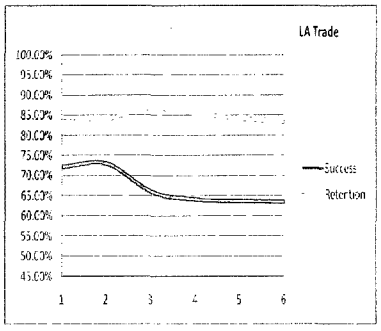
Colleges: American River, Cosumnes River, Sacramento City

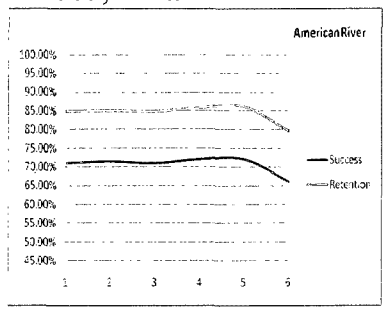
Funded; Multi

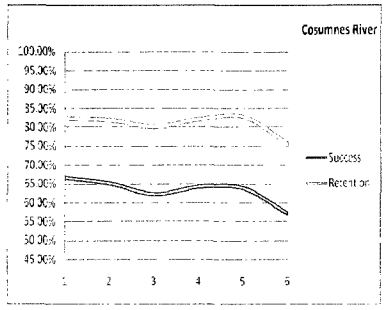


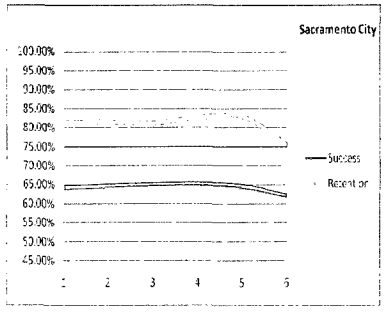




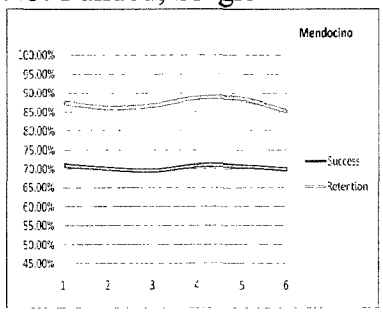




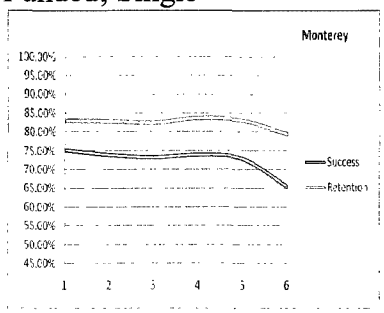




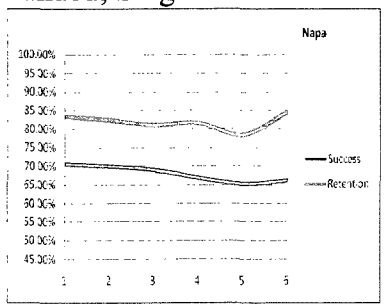
District: Mendocino-Lake
College: Mendocino
Not-Funded; Single



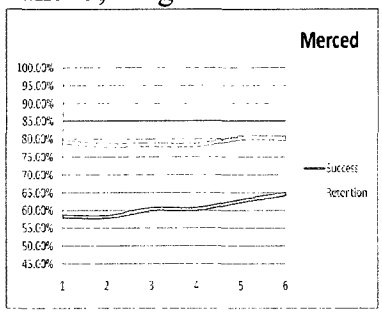
District: Monterey Peninsula
College: Monterey
Funded; Single



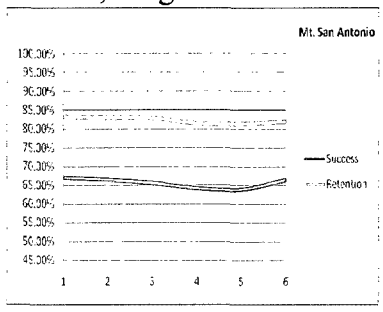
District: Napa Valley
College: Napa
Funded; Single



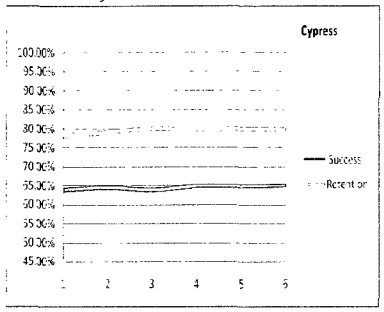
District: Merced
College: Merced
Funded; Single



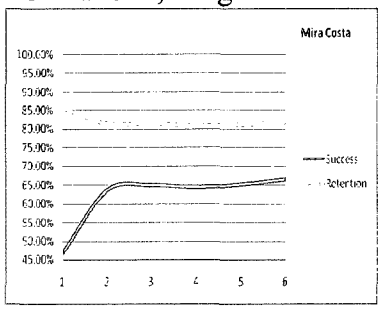
District: Mt. San Antonio
College: Mt. San Antonio
Funded; Single



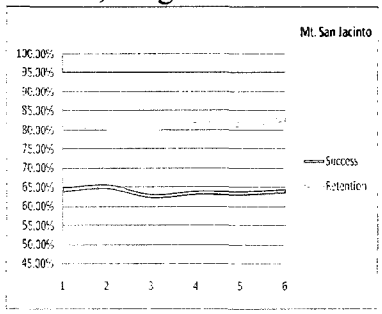
District: North Orange
Colleges: Cypress and Fullerton
Funded; Multi

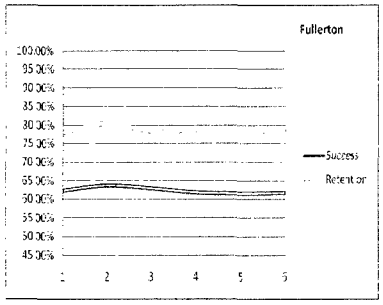


District: Mira Costa
College: Mira Costa
Not-Funded; Single

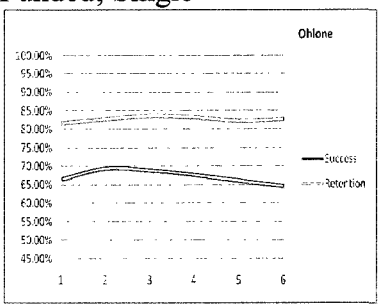


District: Mt. San Jacinto
College: Mt. San Jacinto
Funded; Single

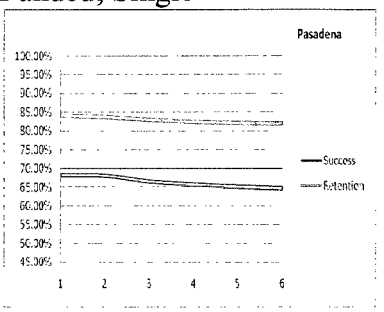


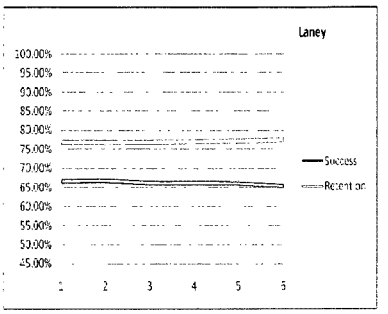


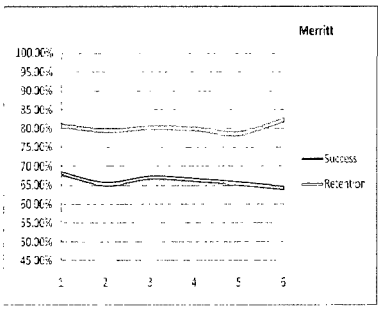
District: Ohlone
College: Ohlone
Funded; Single



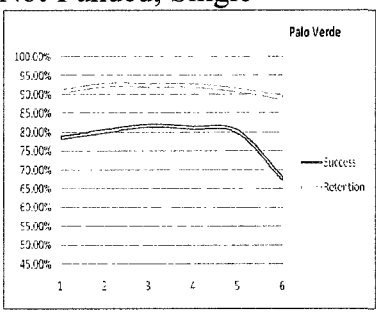
District: Pasadena
College: Pasadena
Funded; Single



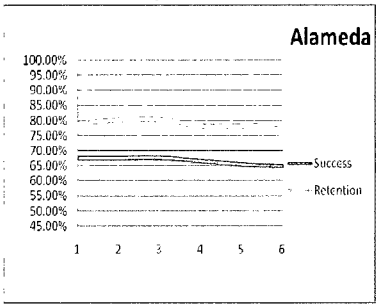




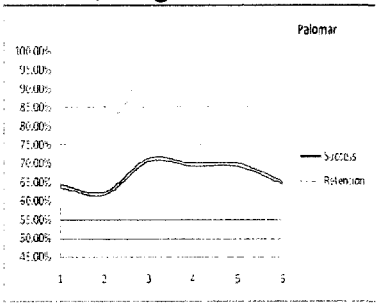
District: PaloVerde
College: Palo Verde
Not-Funded; Single

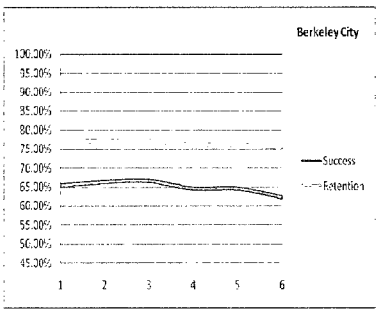


District: Peralta
Colleges: Alameda, Berkeley City, Laney, Merritt
Not-Funded; Multi

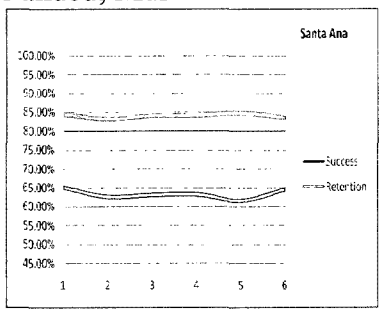


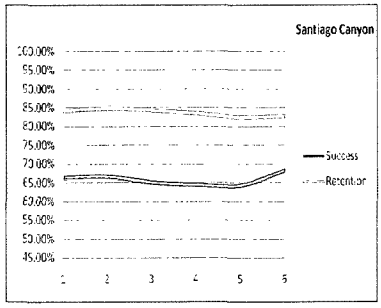
District: Palomar
College: Palomar
Funded; Single



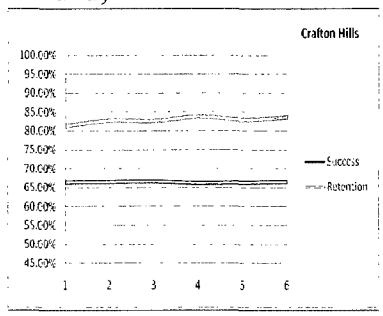


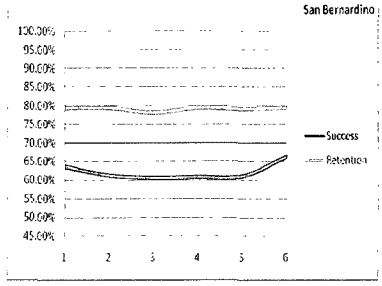
District: Rancho Santiago
College: Santa Ana and Santiago Canyon
Funded; Multi



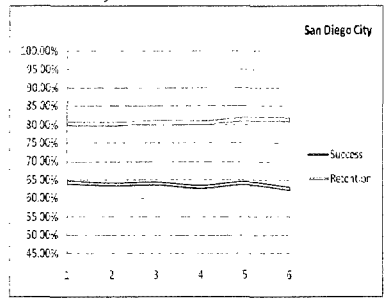


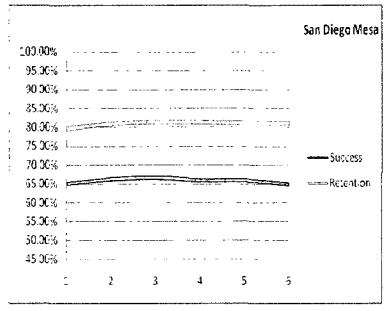
District: San Bernardino
Colleges: Crafton Hills and San Bernardino
Funded; Multi

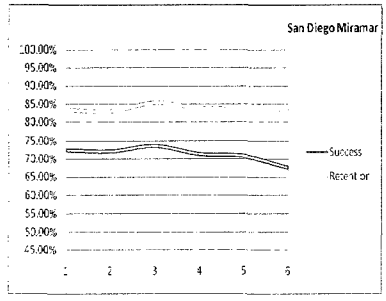




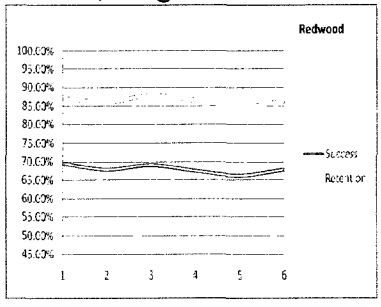
District: San Diego
Colleges: San Diego City, San Diego Mesa, San Diego Miramar
Funded; Multi



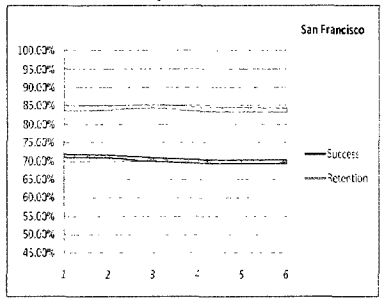




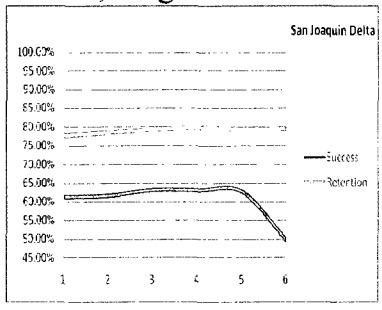
District: Redwood
College: Redwood
Funded; Single



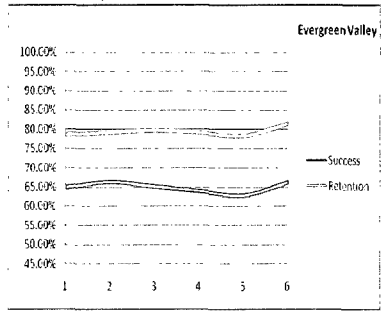
District: San Francisco
Colleges: San Francisco
Not Funded; Multi*

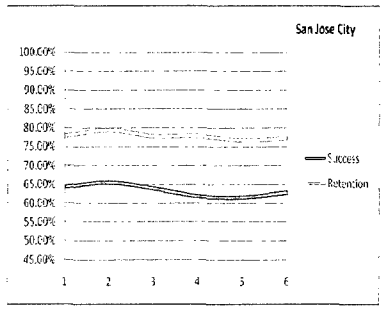


District: San Joaquin Delta
College: San Joaquin Delta
Funded; Single

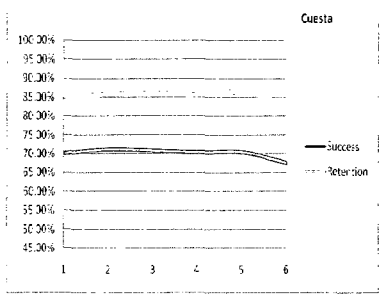


District: San Jose-Evergreen
Colleges: Evergreen Valley, San Jose City
Funded; Multi

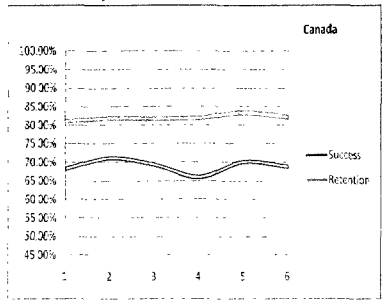


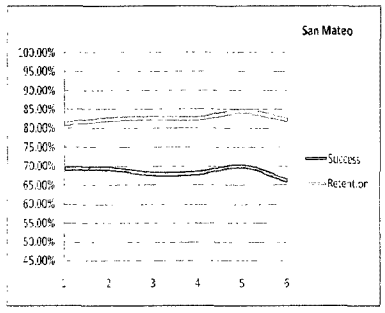


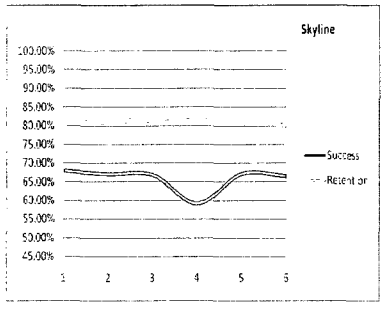
District: San Luis Obispo
College: Cuesta
Funded; Single



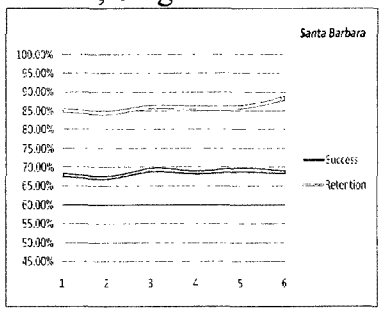
District: San Mateo
Colleges: Canada, San Mateo, Skyline
Funded; Multi



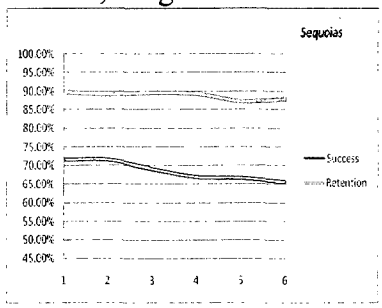




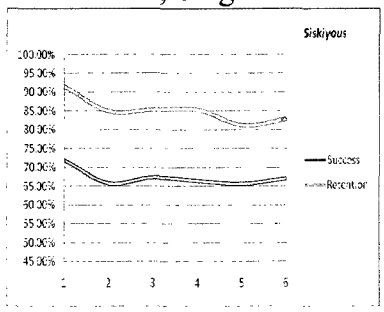
District: Santa Barbara
College: Santa Barbara
Funded; Single



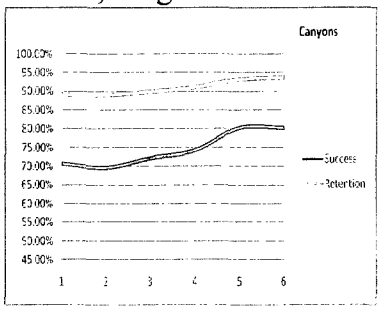
District: Sequoias
Colleges: Sequoias
Funded; Single



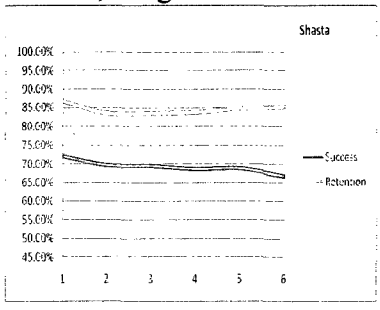
District: Siskiyou
Colleges: Siskiyou
Not-Funded; Single



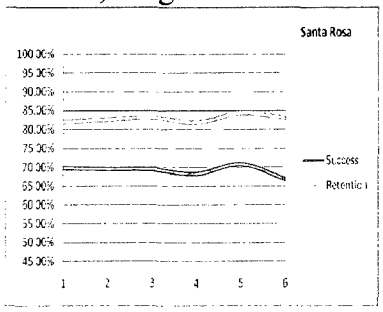
District: Santa Clarita
Colleges: Canyons
Funded; Single



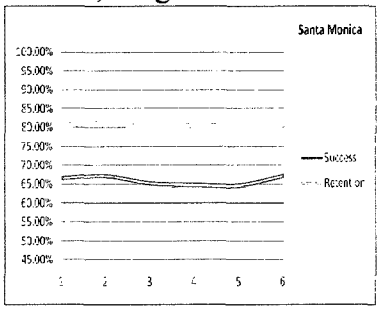
District: Shasta-Tehama-Trinity
College: Shasta
Funded; Single



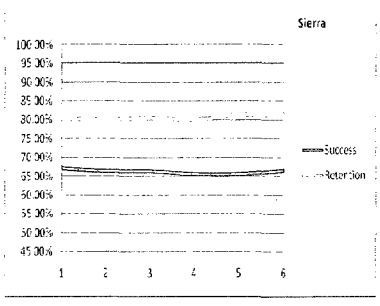
District: Sonoma
College: Santa Rosa
Funded; Single



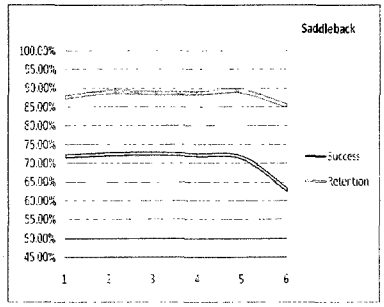
District: Santa Monica
Colleges: Santa Monica
Funded; Single

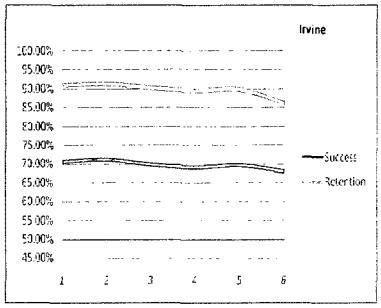


District: Sierra
College: Sierra
Funded; Single

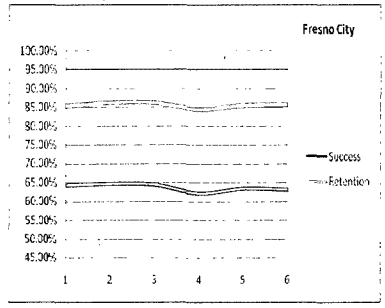


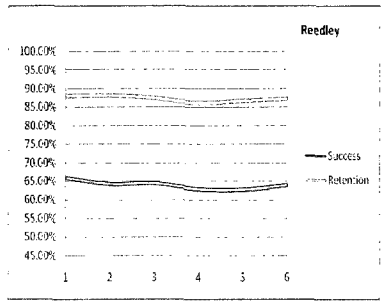
District: South Orange
Colleges: Saddleback, Irvine Valley
Not-Funded; Multi



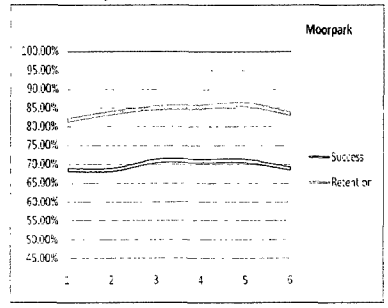


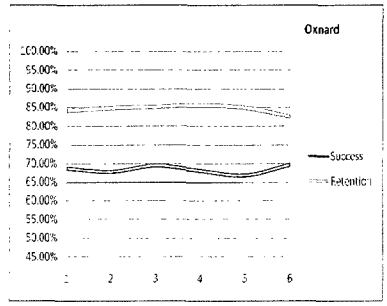
District: State Center
Colleges: Fresno City and Reedley
Funded; Multi

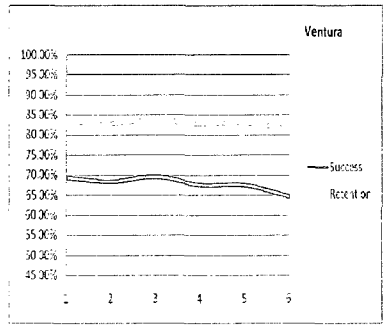




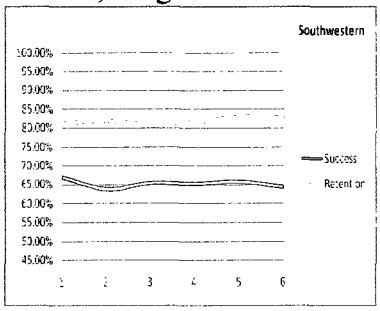
District: Ventura
Colleges: Moorpark, Oxnard, Ventura
Funded; Multi



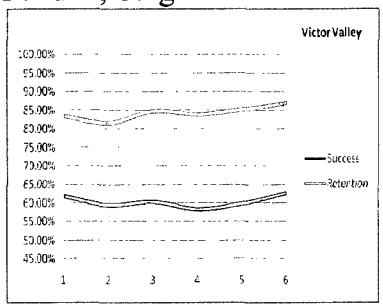




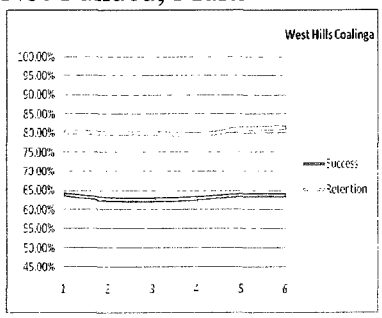
District: Southwestern
College: Southwestern
Funded; Single



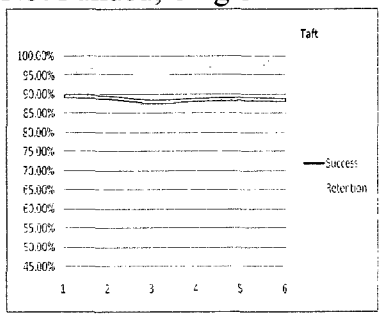
District: Victor Valley
Colleges: Victor Valley
Funded; Single



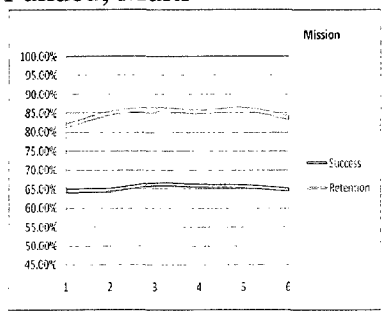
District: West Hills
College: West Hills-Coalinga
Not-Funded; Multi*

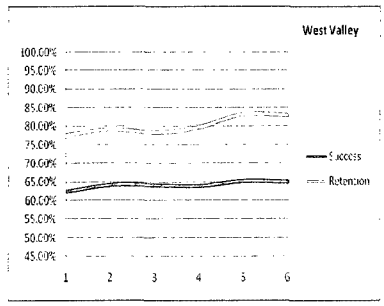


District: West Kern
Colleges: Taft
Not Funded; Single

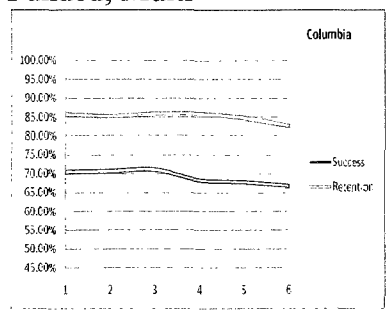


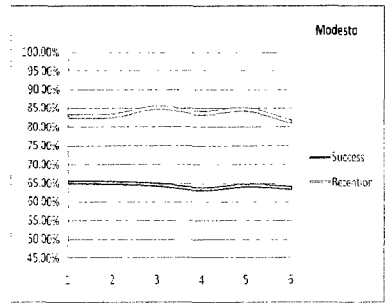
District: West Valley-Mission
Colleges: Mission and West Valley
Funded; Multi





District: Yosemite
Colleges: Columbia and Modesto
Funded; Multi





District: Yuba
Colleges: Yuba
Funded; Single