DOCUMENT RESUME

ED 357 667 HE 026 413

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TITLE Retention and Performance of At-Risk Students in the California State University System. Knowledge Brief Number Ten.
INSTITUTION Far West Lab. for Educational Research and Development, San Francisco, Calif.
SPONS AGENCY Office of Educational Research and Improvement (ED), Washington, DC.
PUB DATE 92
CONTRACT RP91002066
NOTE 8p.
PUB TYPE Information Analyses (070) -- Reports - General (140)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Academic Achievement; *Academic Aptitude; Academic Persistence; Comparative Analysis; Dropout Rate; Higher Education; *High Risk Students; Mathematics Achievement; Outcomes of Education; Postsecondary Education; Research; *School Holding Power; Scores; Undergraduate Students; Undergraduate Study
IDENTIFIERS *California State University

ABSTRACT

This paper summarizes evaluation data of at-risk student outcomes within the California State University (CSU) System in terms of student retention and academic performance. Findings concerning student retention are presented in the following areas: retention by ethnicity and by admission basis; retention by entering test performance; and the retention rates across cohorts and programs. This is followed by an analysis of student performance in the Intensive Learning Experience (ILE) remedial program and in the orientation program, Summer Bridge; and of student performance on the Entry Level Mathematics (ELM) exam and subsequent enrollment and grades in baccalaureate mathematics courses. Among the key findings are that: (1) passing ELM greatly increased student chances of enrolling in and passing baccalaureate math; (2) retention figures for ILE students were comparable to overall CSU system figures; and (3) many students who fail the ELM exam and retake it go on to pass the exam and eventually succeed in their baccalaureate course. (GLR)

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The California State University (CSU) system enrolls nearly 350,000 students on 20 campuses. Within the student population, however, Hispanic, African-American, and other minority students are under-represented. Although Hispanic youths constitute 23.0 percent of California's 18-20 year-olds, only 8.5 percent are eligible for admission to the CSU system; and African-Americans make up 8.9 percent of the young adult population, but only 5.5 percent are eligible. In contrast, 61.3 percent of 18-20 year-olds are Caucasian, but nearly 75 percent meet the admissions standards (California State University Commission on Hispanic Under-representation, 1984). There is thus a compelling need to focus on increasing university enrollment of African-American, Hispanic, recently-arrived Asian, and Native American students in California.

Many of the students who do enter the system are under-prepared academically, are the first generation in their family to attend college, or are financially disadvantaged. Within the CSU system, minorities account for over 80 percent of those scoring in the lowest quartile on the English Placement Test (EPT), and nearly 50 percent of those scoring in the lowest quartile of the Entry Level Mathematics exam (ELM). In addition, nearly 70 percent of African-American students and 38.0 percent of Hispanics enter the CSU system through a "special admission" provision, i.e., they do not meet the regular admissions criteria.

Each of the system's campuses has developed various programs to address these twin concerns of under-representation and under-preparation for minority students; however, it wasn't until 1986 that the Chancellor's Office of the CSU took a systemwide approach through two specially-designed programs: the Summer Bridge and Intensive Learning Experience (ILE) programs. Both are designed to provide basic skills instruction, orientation, and advisement to entering CSU students who have a high potential for dropout or failure. And the underlying objective of each is to increase the enrollment and retention of under-represented minorities in the CSU system.

Summer Bridge is a three-to-six week (largely) residential program for incoming first-time freshmen. The primary focus is on under-represented students; but special admission students, first generation college students, and those participating in other equity programs are also targeted. Over the summer, participants are given review in English and mathematics as well as academic advising, counseling, and orientation to the university.

The Intensive Learning Experience program offers remediation in English and mathematics to students who score in the lowest quartile on the English and mathematics exams taken by entering freshmen. Student are given a full academic year of writing and/or math in small classes.

## *Evaluation*

From 1986 to 1991, Far West Laboratory for Educational Research and Development conducted a five-year, longitudinal evaluation of the two programs (L.F. Guthrie & G.P. Guthrie, 1988; L.F. Guthrie, G.P. Guthrie, Long, & Boothroyd, 1988; L.F. Guthrie, G.P. Guthrie, & Tokunaga, 1991). The evaluation assessed outcomes for students in two broad areas: retention (continued enrollment) and academic performance. Three cohorts of Summer Bridge and ILE students were tracked over a five year period. Using both qualitative and quantitative methods, a sample of nearly 7,000 Summer Bridge and over 12,000 ILE students across all campuses were studied along several dimensions. With comparison groups, the total study sample included nearly 40,000 students.

This brief summarizes the findings of the evaluation in terms of student retention and academic performance. First is a summary of findings on retention; next, findings are presented from the analysis of ILE student performance in mathematics through an examination of students' performance on the Entry Level Mathematics exam and enrollment and grades in baccalaureate mathematics courses.

## *Student Retention*

Not only are Native Americans, African-Americans, and Hispanics under-represented in the CSU

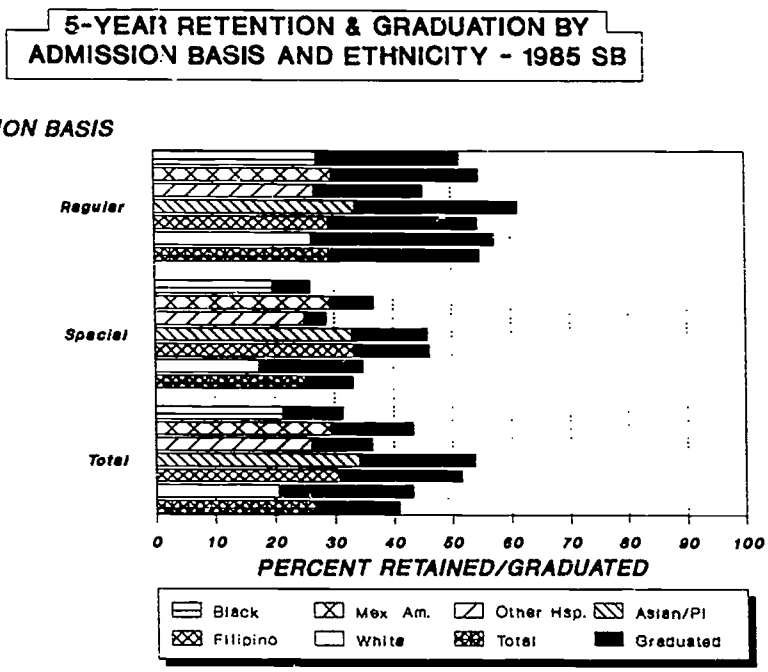



FIGURE 1

system, but fewer students from these groups persist to graduation. While about 50 percent of regularly admitted Caucasian students are either still enrolled or have graduated after five years, the figure for African-Americans is only 38.8 percent. Among special admits, 32.4 percent of Caucasians and 23.7 percent of African-Americans were retained (California State University, Office of the Chancellor, Division of Analytical Studies, 1985).

Retention rates for Summer Bridge and ILE students were analyzed from several perspectives in order that we might identify factors associated with greater retention. We looked at various subpopulations of students as defined by campus, ethnicity, admission basis, and student major to see which have the greatest rate of persistence.

Some caution must be used in interpreting retention rates: students in the 1980s do not enroll continuously to graduation, but may work for one or more terms and return to college later. This is especially true of those for whom finances are a concern.

### Retention of Summer Bridge Students

Retention of Summer Bridge students was examined along the dimensions of admission basis, ethnicity, and entering ELM score. In the following discussion, we also make comparisons to the CSU systemwide retention rates.

### Retention by Ethnicity and Admission Basis

Figure 1 shows retention/graduation rates by admission basis and ethnicity for the 1985 Summer Bridge cohort. After five years, the highest persistence rates were achieved by Asians (53.8 percent) and Filipinos (51.6 percent). African-Americans (31.3 percent) and Native Americans (35.4 percent) had the poorest retention/graduation rates. Whether students entered through regular or special admission basis, this pattern across ethnic groups is maintained.

An important goal of the Summer Bridge program is to increase the retention and graduation of under-represented minority students. To explore the program's effectiveness in this area, we extracted retention data on these students for each campus and found that seven campuses retained or graduated over 40 percent of under-represented minorities after five years.

### Retention by Entering Test Performance

A final way in which we have examined retention among Summer Bridge and ILE students is in relation to scores on the Entry Level Mathematics exam and the English Placement Test. Retention of ILE students was examined in relation to initial ELM and EPT scores. Because of the program's particular emphasis on academic performance, these analyses are especially important.

In our earlier report (L.F. Guthrie & G.P. Guthrie, 1988), we found a positive correlation between entering ELM score and retention. Table 1 shows five-year retention/graduation rates for the 1985 ILE and comparison groups by ELM score bands. The first three score categories represent the lowest quartile for ELM, the ILE-eligibility criterion. The score bands show progressively higher retention rates.

We also looked at retention/graduation rates for the group of students who were eligible for ILE, but not enrolled. For students having ELM scores, rates were generally higher for ILE students than for the ILE-Eligible[1]. Across score bands, ILE students in the 16-21, 33-37, and 38+ score bands had higher retention/graduation rates; only the lowest band favored the ILE-Eligible group. This suggests that ILE math may have a greater impact on students' retention than

[1] Note that ELM scores were reported for only a sub-sample of ILE, ILE-Eligible, and ILE-Marginal students. About 60 percent of ILE and 80 percent of ILE-Eligible and ILE-Marginal students had ELM scores.

other remedial math courses. Contrary to expectations, ILE students' retention rates also exceeded those of the group of students who scored marginally above the ILE cut-off in all but the 26-32 score band.

Now consider comparable analyses on initial English Placement Test scores and retention/graduation for the 1985 ILE cohort and comparison groups (Table 2). A different pattern emerges. Retention/graduation rates for students in the lowest score bands (120-126; 127-135) are greater than for those students who scored highest (151+). Notice especially that among special admission students, only 31.0 percent of those with passing scores were still enrolled, compared to 35.3 percent in the lowest band.

**Retention Rates Across Cohorts and Programs**

Figure 2 shows five-year retention/graduation rates by admission basis for Summer Bridge, ILE, and the 1983 cohort of first-time freshmen in the CSU system. These comparisons reveal the effectiveness of both programs in retaining special admit students who are from largely under-represented minority backgrounds. Systemwide, 33.2 percent of special admits were still enrolled, compared to 33.0 percent for Summer Bridge and 37.8 percent for ILE.

*Student Performance*

A common goal of both Summer Bridge and ILE is to improve students' academic performance in the university, and more specifically, in baccalaureate English and mathematics. The expectations for each program are not the same, however, given the differences in focus and scope. Summer Bridge is designed to improve students' orientation and adjustment to university life, as well as their academic performance. The program provides, at most, four-to-five weeks of review and instruction. For ILE, on the other hand, the primary objective is to ensure students' success in math and English, and ILE courses may span two full semesters.

In the evaluation of these programs, we approached the issue of performance in several ways. We examined students' overall GPA and then analyzed their grades in baccalaureate English and math. We also explored patterns of course-taking in English and math by measuring students' enrollment in remedial, baccalaureate, and other courses. This section focuses on the relationship between Intensive Learning Experience students' entering Entry Level Mathematics score and success in baccalaureate mathematics courses.

Grade reports covering the first four years of enrollment for the 1985-86 cohort of ILE students were examined to determine the proportion of students who a) enrolled in baccalaureate math by the end of their fourth year and b) received a passing grade. The sample of ILE students were first divided into three groups based upon their initial ELM score: ILE (25 or less), Marginal (26-37), and Passing (38 or above). Students having no ELM score were excluded from the analysis. Figure 3 shows the number within each group who re-enrolled in the university, took a baccalaureate

Table 1
1985-86 Cohort
Five-Year Retention and Graduation* by ILE Comparison Groups, Admission Basis, and ELM Score Categories
ILE
ELM Score Categories

| | 1-15 | | 16-21 | | 22-25 | | 26-32 | | 33-37 | | 38+ | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Admission Basis | N | % | N | % | N | % | N | % | N | % | N | % | N | % |
| Alternate | 0 | 0.0 | 1 | 33.3 | 2 | 50.0 | 1 | 25.0 | 0 | 0.0 | 7 | 58.3 | 11 | 37.9 |
| Regular | 15 | 36.6 | 82 | 46.3 | 107 | 48.4 | 84 | 45.9 | 73 | 53.3 | 291 | 55.4 | 652 | 50.7 |
| Special | 32 | 22.0 | 97 | 31.8 | 66 | 30.7 | 62 | 29.9 | 44 | 42.4 | 91 | 48.4 | 392 | 33.7 |
| Total | 47 | 24.7 | 180 | 37.1 | 175 | 39.7 | 147 | 37.2 | 117 | 48.1 | 389 | 53.7 | 1055 | 42.5 |

Table 2
1985-86 Cohort
Five-Year Retention and Graduation* by ILE Comparison Groups, Admission Basis, and EPT Score Categories
ILE
EPT Score Categories

| | 120-126 | | 127-135 | | 136-141 | | 142-145 | | 146-150 | | 151+ | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Admission Basis | N | % | N | % | N | % | N | % | N | % | N | % | N | % |
| Alternate | 3 | 33.3 | 5 | 45.5 | 2 | 20.0 | 0 | 0.0 | 1 | 100.0 | 0 | 0.0 | 11 | 29.7 |
| Regular | 54 | 47.8 | 187 | 52.6 | 330 | 61.1 | 56 | 35.9 | 85 | 48.8 | 52 | 39.4 | 764 | 51.9 |
| Special | 54 | 35.3 | 149 | 33.6 | 125 | 36.6 | 32 | 29.1 | 24 | 24.7 | 14 | 33.3 | 398 | 33.5 |
| Total | 111 | 40.3 | 341 | 42.0 | 457 | 51.3 | 88 | 32.6 | 110 | 40.4 | 66 | 37.5 | 1173 | 43.5 |

* Percentages represent the number of students retained *or* graduated.

## 5-YEAR RETENTION & GRADUATION FOR SUMMER BRIDGE, ILE, AND THE CSU SYSTEM

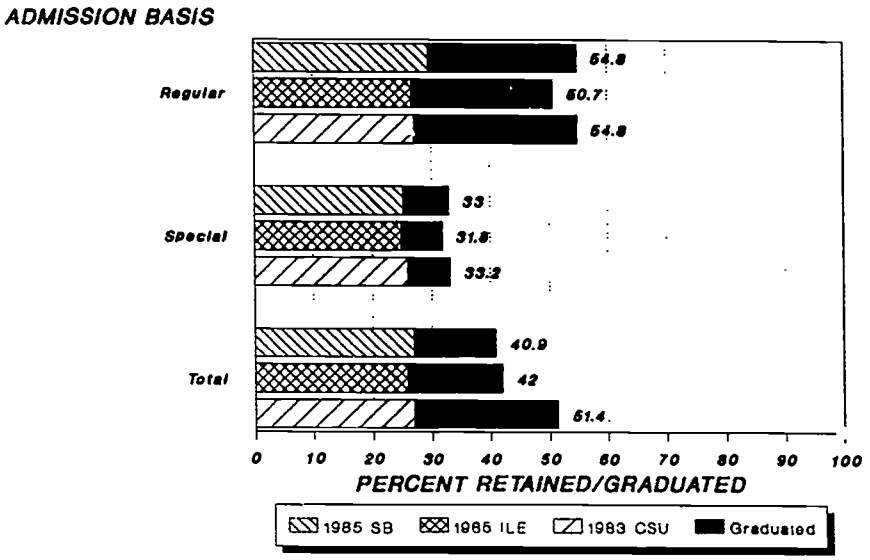



FIGURE 2

math course, and received a passing grade.

The analysis reveals a clear connection between students' initial ELM score and subsequent retention, enrollment in baccalaureate math, and course success. On each measure, the ILE students were less successful than either the Marginal or Passing groups. A smaller percentage of ILE students re-enrolled, fewer took baccalaureate math, and very few received a passing grade in their math course.

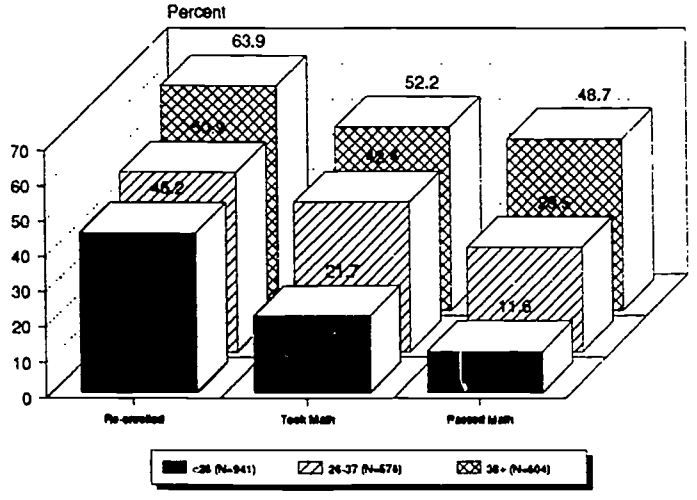
In interpreting these findings, bear in mind that the opportunities to enroll in a baccalaureate math course were not equal across the three groups. While all students in the sample had at least one academic year in which to take the math course, those who passed ELM on the first attempt had four full years. Students scoring in the bottom quartile on ELM, on the other hand, may have spent up to two semesters in ILE or other remedial courses; Marginal students might have enrolled in other remedial math courses prior to their baccalaureate course. Furthermore, a passing ELM grade is technically a prerequisite to enrollment in baccalaureate math; thus, we would expect the course-taking rates to be higher among those who eventually managed to score above 38 on the ELM exam.

Figures 4, 5, and 6 allow for a closer examination of the ILE and other students' math experiences in the first four years. Figure 4 shows that of the 941 ILE students, 431 (45.8 percent) took ELM only once; of those, only 22 (5.1 percent) eventually passed baccalaureate math. A passing score on the ELM exam is a prerequisite to graduation, and students can take the exam as many times as necessary to pass. Thus, many of the students who intially failed the exam made further attempts. A total of 155 (16.5 percent) passed ELM, and 58 of those (37.2 percent) went on to pass the course. Over 350 students did not manage to pass the exam after four years, however. From this unsuccessful group, only 29 (8.2 percent) were able to take and pass the course.

This analysis demonstrates the importance of passing ELM; even if students fail on the first attempt, nearly 40 percent of the 155 who take the exam again and pass it, eventually succeed in their baccalaureate course.

In the Marginal group (Figure 5), about half the students (272) took ELM only once. Compared to the

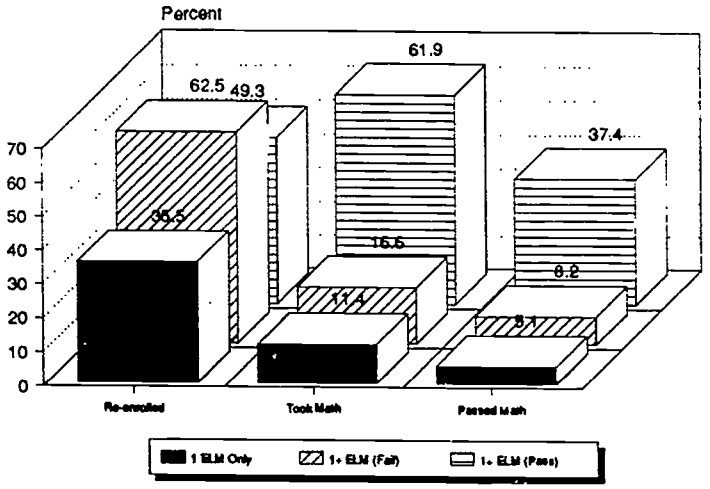
## 1985-1986 INTENSIVE LEARNING EXPERIENCE




| | | Re-enrolled | | Took Math | | Passed Math | |
|---|---|---|---|---|---|---|---|
| ELM Score | Total # | # | % | # | % | # | % |
| 25 or less | 941 | 425 | 45.2 | 204 | 21.7 | 109 | 11.6 |
| 26-37 | 576 | 293 | 50.9 | 244 | 42.4 | 170 | 29.5 |
| 38+ | 604 | 386 | 63.9 | 315 | 52.2 | 294 | 48.7 |

FIGURE 3

## MATH PERFORMANCE FOR ILE STUDENTS (N=941)




| | | Re-enrolled | | Took Math | | Passed Math | |
|---|---|---|---|---|---|---|---|
| ELM Attempts | Total # | # | % | # | % | # | % |
| 1 ELM Only | 431 | 153 | 35.5 | 49 | 11.4 | 22 | 5.1 |
| 1+ ELM (Fail) | 355 | 175 | 62.5 | 59 | 16.6 | 29 | 8.2 |
| 1+ ELM (Pass) | 155 | 97 | 49.3 | 96 | 61.9 | 58 | 37.4 |

FIGURE 4

ILE group, these students performed much better. Nearly one-fourth (24.6 percent) passed the baccalaureate math course (67), compared to only 5.0 percent of the bottom quartile (ILE) students. However, for the Marginal group students who attempted the exam more than once, course enrollment and passing rates are similar to those of bottom-quartile students who took the exam again. Of these students, nearly two-thirds eventually passed (198), and as with the ILE group, about 40 percent of the test-passers went on to pass the course.

Figure 6 displays comparable data for the highest group — those who passed ELM on the first attempt. Math course enrollment rates for students in this group are greater than those for the other two. Over half (315) enrolled in baccalaureate math, and nearly as many (48.7 percent) were able to pass the course.

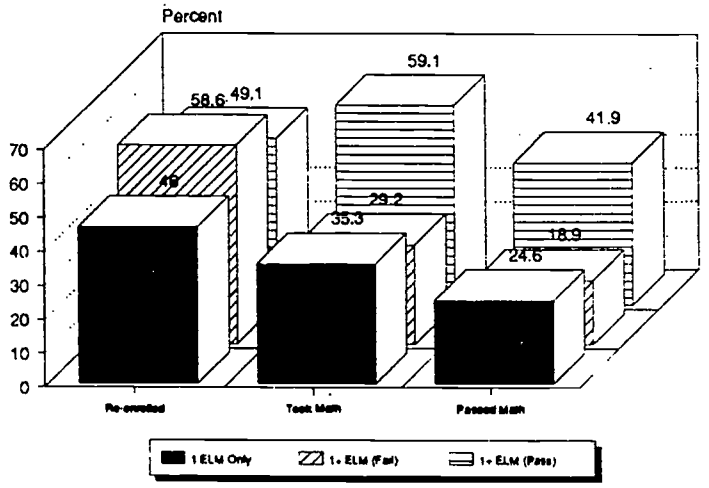
This analysis illustrates the effect of taking ELM more than once on baccalaureate math performance. For example, only about 11 percent of ILE students who took ELM only once managed to enroll in baccalaureate math, and only 22 (5.1 percent) of that group passed the course. However, the percentage of students who took ELM more than once and who eventually passed ELM is roughly equivalent across the Marginal and Passing groups. Once they managed to pass the exam, roughly 40 percent of these students went on to succeed in the course, regardless of their initial score.

### Key Findings on Student Performance

- The initial score on the ELM exam is associated with baccalaureate math enrolling in and passing. Only 11.6 percent of ILE students pass math, compared to nearly 50 percent of those who pass ELM on the first attempt and 29.5 percent of Marginal students who nearly pass ELM on the first try.

- Passing ELM greatly increases students chances of enrolling in and passing baccalaureate math. After four years, about 40 percent of those students who eventually pass ELM manage to pass baccalaureate math — regardless of their initial score.

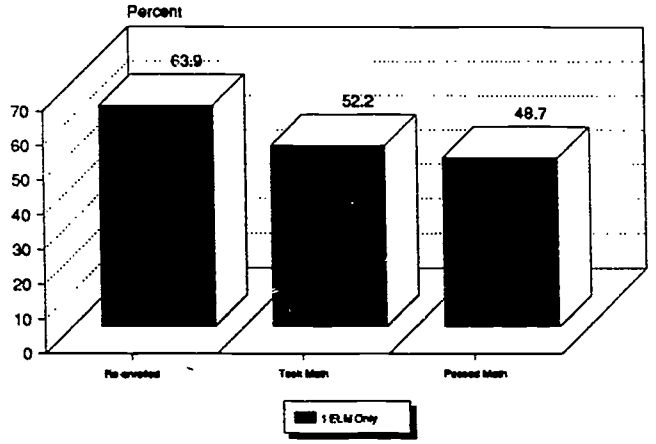
## MATH PERFORMANCE FOR MARGINAL GROUP (N=576)




| | | Re-enrolled | | Took Math | | Passed Math | |
|---|---|---|---|---|---|---|---|
| ELM Attempts | Total # | # | % | # | % | # | % |
| 1 ELM Only | 272 | 125 | 46.0 | 96 | 35.3 | 67 | 24.6 |
| 1+ ELM (Fail) | 106 | 52 | 58.6 | 31 | 29.2 | 20 | 18.9 |
| 1+ ELM (Pass) | 198 | 116 | 49.1 | 117 | 59.1 | 83 | 41.9 |

FIGURE 5

## MATH PERFORMANCE FOR PASSING GROUP (N=604)




| | | Re-enrolled | | Took Math | | Passed Math | |
|---|---|---|---|---|---|---|---|
| ELM Attempts | Total # | # | % | # | % | # | % |
| 1 ELM Only | 604 | 386 | 63.9 | 315 | 52.2 | 294 | 48.7 |

FIGURE 6

### Key Findings on Student Retention Summer Bridge

- Retention of Special Admit students compared favorably to that of the CSU system. Five-year retention/graduation rates were 33.0 percent for Summer Bridge and 33.3 percent for the system.

- Seven campuses retained or graduated over 40 percent of under-represented minorities: Fresno, Northridge, Bakersfield, Sacramento, Dominguez Hills, Humboldt, and Los Angeles.

### Intensive Learning Experience

- Retention of ILE Special Admits compared favorably to CSU system figures. Five-year retention/graduation rates were 31.8 percent for ILE and 33.2 percent for the system.

- Retention/graduation rates of ILE students with ELM scores were higher than those of the ILE-Eligible comparison group (42.5 percent to 40.5 percent). However, retention rates for all ILE students were less.

- Relationships between ILE students' ELM and EPT scores were similar to those for Summer Bridge. ELM scores were positively correlated to retention; EPT scores were not. However, EPT scores did have a linear relationship with rates of graduation.

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### KNOWLEDGE BRIEF

Far West Laboratory for Educational Research and Development serves the four-state region of Arizona, California, Nevada, and Utah, working with educators at all levels to plan and carry out school improvements. The mission of FWL is to assist educators in the region by linking them with colleagues; sharing information, expertise and innovative practices; and providing technical assistance to build local capacity for continued self-improvement.


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This publication is supported by federal funds from the U.S. Department of Education, Office of Educational Research and Improvement, contract no. RP91002066. Its contents do not necessarily reflect the views or policies of the Department of Education, nor does mention of trade names, commercial products or organizations, imply endorsement. Reprinting is encouraged with proper credit.