

Memo

To: Guy Sievert, Dean of Academic Services
Executive Deans
Deans of Instruction
Deans of Student Development
Nan Poppe, Dean Cascade OC – Adult and Continuing Education
Diane Mulligan, Dean Student Support Services
Steve Hudson, Dean Lower Division Transfer and Developmental Education
Frieda Campbell-Peltier, Co-Chair Developmental Education SAC
David Jacobsen, Co-Chair Developmental Education SAC

From: Ron Smith, Research Evaluation Coordinator

CC: Susan Bach, Director Institutional Research

Date: March 21, 2003

Re: Student Persistence and the Timing of Developmental Education Coursework

Attached to this memo you will find a report on research that examined the relationship between the timing of DE class-taking and student persistence. The general question that led to the research was asked by Dr. Mildred Ollee.

This study takes a different look at Developmental Education than some of our earlier studies. Those studies included looks at the movement of students through DE classes to the next level classes in Reading, Writing and Mathematics and a study of the success of students in DE classes based on their scores on the placement tests.

Rather than getting into the details of the study in this memo, I will keep it short and let you get to the report. If you have any questions, please do not hesitate to contact me.

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Student Persistence and the Timing of Developmental Education Coursework:

A Preliminary Exploration

Students new to PCC who tested into DE classes stayed in college longer when those classes were taken early in their college attendance. These students persisted in their education at PCC at significantly higher rates than students whose DE course-taking was delayed or non-existent.

The general question that led to this study was whether the timing of developmental coursework in writing, reading and mathematics was related to student success at PCC. In order to examine and attempt to answer the question, some decisions were made about which specific students to study, how to define the timing of DE coursework and how to define student success.

Those definitions are below, followed by a discussion of the methods used in the study, the results and recommendations for future research based on those results. The graphs in the body of the paper combine all the students who tested into DE subject areas. Graphs and tables of the results broken out by the number of DE subject areas tested into are found in the appendices that are attached to the study.

Definitions

Students meeting the following criteria had their records selected for the study:

- New to PCC in the Fall 1999, Fall 2000 or Fall 2001 terms,
- Had taken placement tests prior to the start of the Fall terms, and
- Tested into at least one Developmental Education subject area.

Overall, there were 7,883 students meeting the first two criteria. Of those 3,497 (44.4%) did not test into any DE subject areas, while 4386 (55.6%) did test into one or more DE subject area. Of the students who needed one or more DE subject area classes, 1,818 (41.4%) tested into one subject area, 1,380 (31.5%) tested into two subject areas and 1,188 (27.1%) tested into all three subject areas.

Student success was defined as term-to-term persistence, taking three views: Fall->Winter, Fall->Winter->Spring and Fall->Winter->Spring->Following Fall.

Methods

When considering the issue of how to define students who took all their needed DE coursework early in their college career, the decision was made to include those who completed their prescribed courses during their first two terms. This decision was made for two reasons. The first was that one-half of the 4,386 students were enrolled in all their needed DE courses during this time period, providing an adequately sized group for meaningful comparisons. Also, increasing the number of students who take all needed DE classes will be challenging enough given a two-term time frame. A shorter time frame, while desirable, would be far more difficult to achieve.

Students in these cohorts were divided into groups based on two criteria; 1) the number of DE subject areas into which they tested (one, two or three); and 2) whether they enrolled in all the tested-into subject areas during their first two terms at PCC. Students were counted as enrolled in a DE subject area if they were enrolled in **any** course in the subject area(s) into which they tested.

One view was taken combining all the students who tested into any (one, two or three) DE subject areas. Separate views were taken of these students based on the number of subjects into which they tested. The data on placement test results, DE course enrollment, and term to term persistence were extracted from PCC's student information system. **Students were counted as persisting if and only if they were continuously enrolled in all the terms under consideration.**

Statistical tests (chi-square analyses) were performed to determine if a significantly larger proportion of students who were enrolled in all their needed subject areas during their first two terms re-enrolled for subsequent terms than did

students who were not enrolled in all needed subject areas during the first two terms.

Results

The results of this study were clear and definitive. **One-half** of the students in the study were enrolled in all the DE subject areas (Reading, Writing and Math) they tested into during their first two terms. They persisted at significantly higher rates than those who were not enrolled in prescribed DE subject areas.

Placement

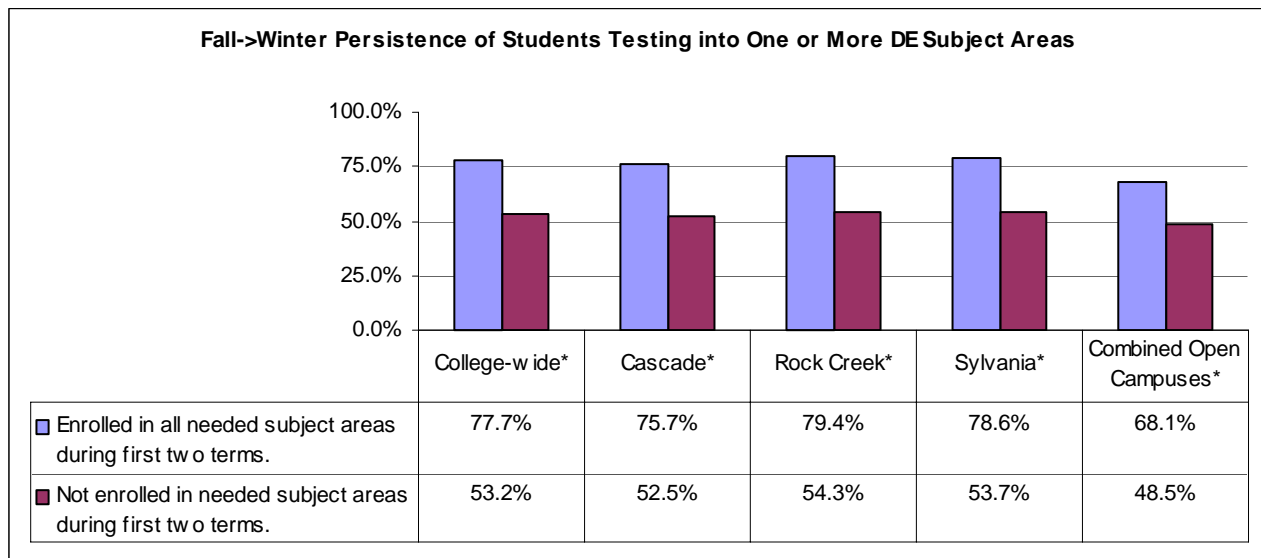
- 41.4% of the students tested into **one subject area**. Of those, **1,144 of 1,818 (62.9%)** were enrolled in that subject area during their first two terms.
- 31.5% of the students tested into **two subject areas**. Of those, **627 of 1,148 (45.4%)** were enrolled in both subject areas in their first two terms. An additional 386 (28%) were enrolled in one of the two subjects. Three hundred and sixty-seven (26.6%) were not enrolled in any of their prescribed subject areas during their first two terms.
- 27.1% of the students tested into all **three subject areas**. Of those, **415 of 1,188 (34.9%)** were enrolled in all three subject areas in their first two terms. An additional 26.7% were enrolled in two of the three subjects and 20.3% were enrolled in one of the three subjects. Two hundred and fifteen (18.1%) were not enrolled in any of their prescribed subject areas during their first two terms.
- Overall, **2,186 of 4,386 (49.8%)** were enrolled **in all** their tested-into DE subject areas during their first two terms.

Persistence: All students who tested into one or more DE subject areas

When combining students who tested into one, two or three subject areas, those who were enrolled in the needed subject areas during their first two terms persisted at significantly higher rates than their peers who were not. The same was generally (but not universally) true when breaking these groups out by the number of subject areas into which they tested.

The following graphs illustrate this point. For Fall to Winter persistence, 77.7% of the group who were enrolled in all their prescribed subject areas during their first two terms were also at PCC for the Winter term, compared with 53.2% of those who were not enrolled in all their prescribed DE subject areas.

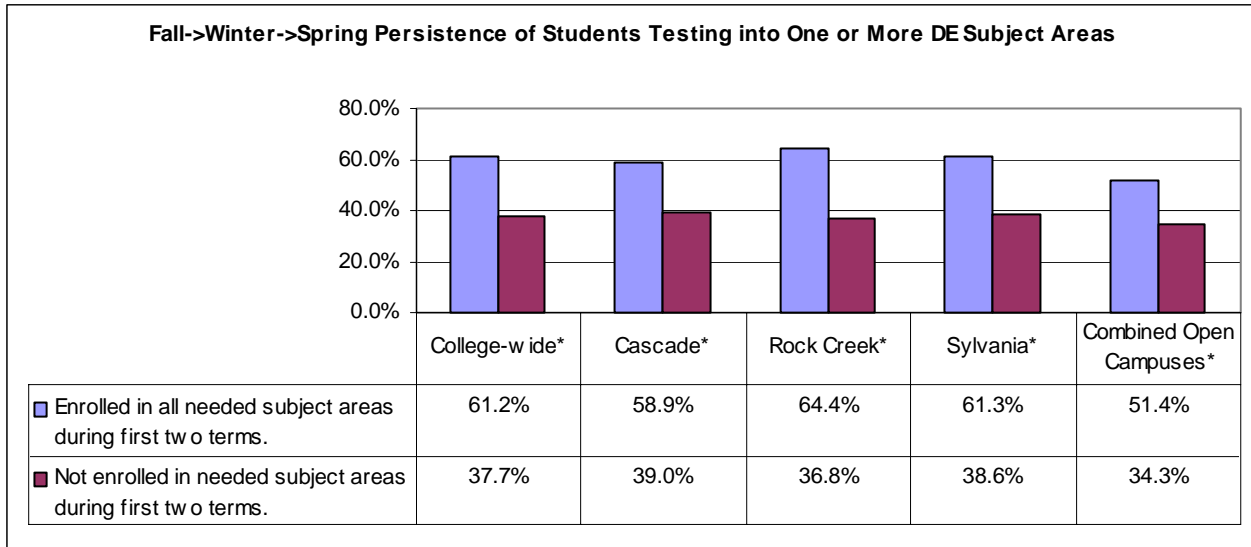
Figure 1. Fall to Winter Persistence.



* Differences were statistically significant.

For the Fall->Winter->Spring persistence view, 61.2% of those who were enrolled in all their needed subject areas persisted, compared with 37.7% of those who were not.

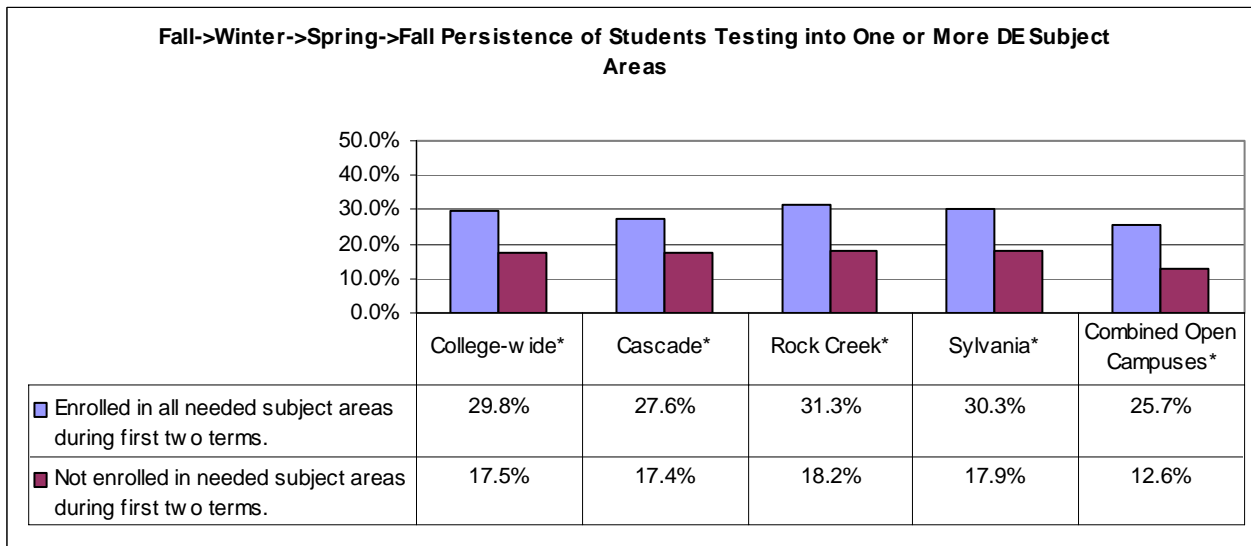
Figure 2. Fall->Winter->Spring Persistence.



* Differences were statistically significant.

The gap remained significant for the Fall to the following Fall period, with 29.8% of those who were enrolled in all their needed subject areas during the first two terms persisting into the following Fall term, compared with 17.5% of those who were not.

Figure 3. Fall->Winter->Spring->Fall Persistence



* Differences were statistically significant.

Persistence: Students testing into one DE subject area.

For students who tested into one subject area, **significantly more students who were enrolled in that subject area during their first two terms re-enrolled for subsequent terms than did students who were not.**

Fall to Winter: 75.7% of the students enrolled in the subject area re-enrolled for the Winter term compared to 53% of those who were not.

Fall->Winter->Spring: 60.8% of the students enrolled in the subject area returned for the Winter and Spring terms, compared to 38.9% of those who were not.

Fall->Winter->Spring->Fall: 30% of the students enrolled in the subject area were continuously enrolled through the following Fall term, compared to 19.4% for those who were not.

Persistence: Students testing into two DE subject areas.

For students who tested into two subject areas **significantly more students who were enrolled in both subject areas during their first two terms re-enrolled for subsequent terms than did students who were not.**

Fall ->Winter: 80.2% of the students enrolled in both needed subject areas re-enrolled for the Winter term compared to 56.2% of those who were not.

Fall->Winter->Spring: 61.6% of the students enrolled in both tested-into subject areas returned for the Winter and Spring terms, compared to 41.3% of those who were not.

Fall->Winter->Spring->Fall: 29.8% of the students enrolled in both tested-into subject areas were continuously enrolled through the following Fall term, compared to 18.5% for those who were not.

Persistence: Students testing into three DE subject areas.

For students who tested into three subject areas, **significantly more students who were enrolled in all the needed subject areas during their first two terms re-enrolled for subsequent terms than did students who were not.** These significant differences existed for all three persistence time frames.

Fall->Winter: 79.3% of the students enrolled in all three subject areas were also enrolled for the Winter term compared to 50.5% of those who were not.

Fall->Winter->Spring: 61.7% of the students enrolled in all three subject areas returned for the Winter and Spring terms, compared to 33.2% of those who were not.

Fall->Winter->Spring->Fall: 29.4% of the students enrolled in all three subject areas were continuously enrolled through the following Fall term, compared to 14.7% for those who were not.

Discussion

The results of this study suggest that steps taken to increase the placement of students who test into DE classes into their prescribed subject areas early during their time at PCC could have a significant impact on their persistence. Given these results, administrators may want to consider taking action to increase early placement.

Among the many actions that could be taken, advising and registration systems could flag students who test into DE classes. Once flagged, some action could occur so that students with a 'DE flag' would have to register for those courses or meet with an advisor before the flag is removed. Another action that could be considered is the adoption of goals for increasing the proportion of students who are enrolled in all their needed DE subject areas early in their college careers. Students who need DE instruction but who are unable to enroll in the classes could be referred to appropriate learning center/tutorial assistance services. These are examples of possible steps that might be taken, it is not meant to be a complete list of the available options.

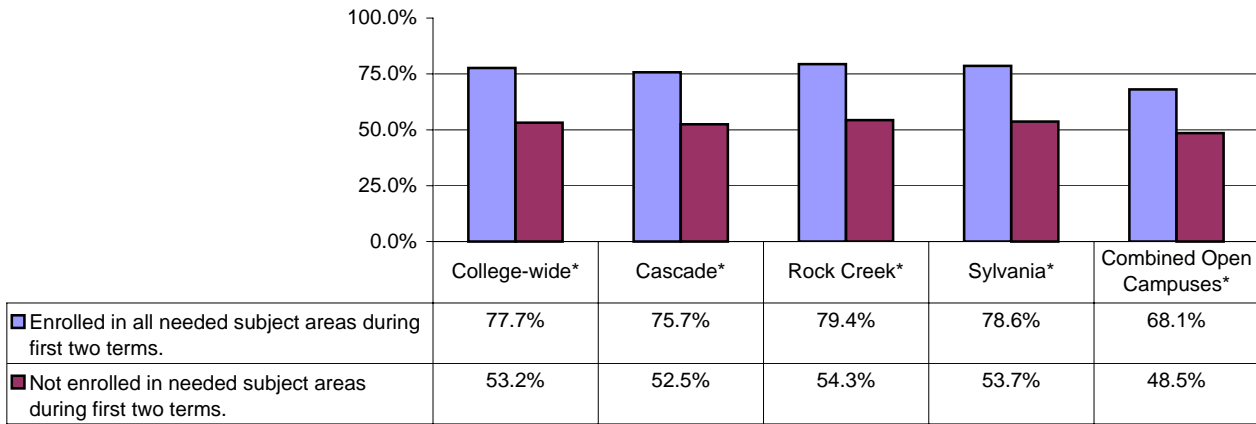
Recommendations for Future Research

1. The issue of course pre-requisites should be re-visited. It is reasonable to hypothesize that students who need DE instruction but have not received it will struggle in courses that require good reading, writing and/or math skills. Research in the area of the relationship between student performance in introductory level courses and DE course enrollment or lack thereof should be able to test that general hypothesis.

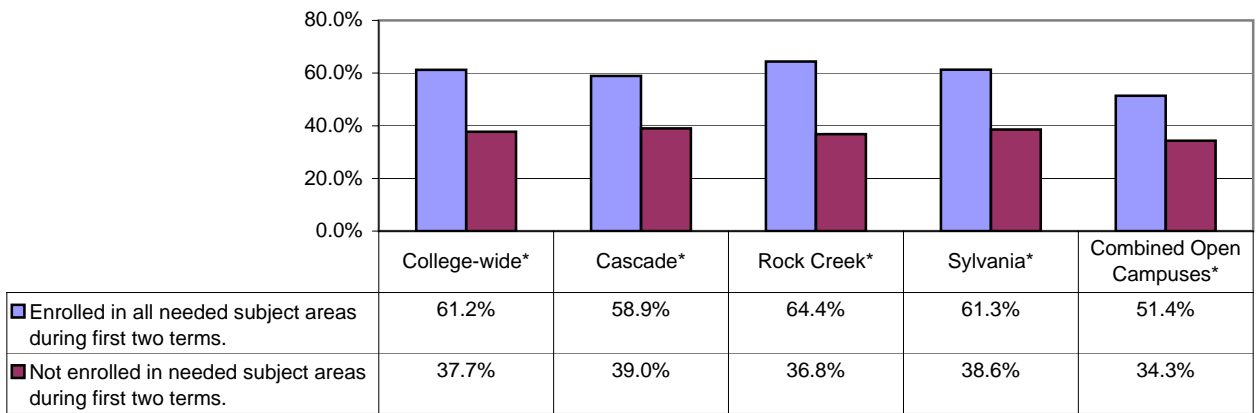
2. Looking at the specific DE subject areas and examining relationships between them and introductory college-level work that appear logically connected to them could be a fruitful area for inquiry. For which specific subject areas is DE math coursework particularly important? Which ones require solid college-level reading or writing skills?

Appendix A

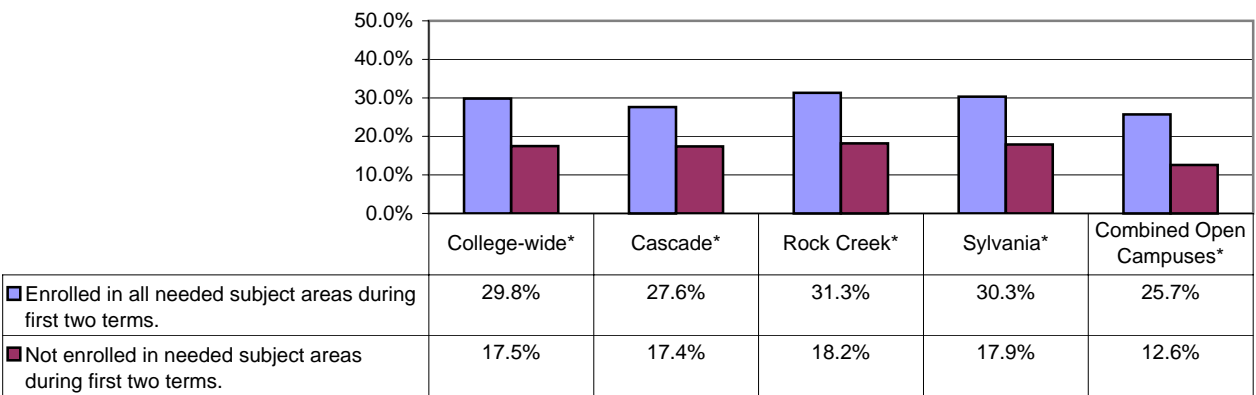
Fall->Winter Persistence of Students Testing into One or More DE Subject Areas



Fall->Winter->Spring Persistence of Students Testing into One or More DE Subject Areas

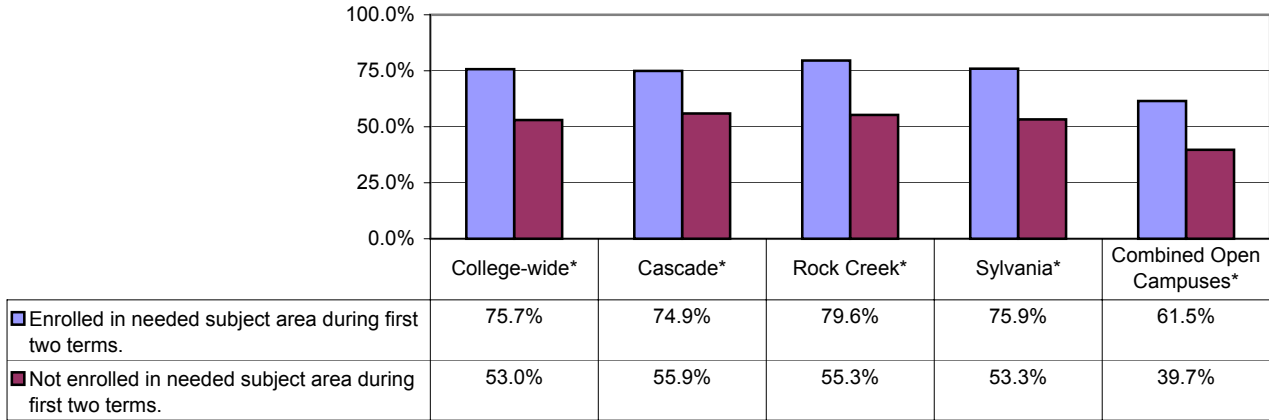


Fall->Winter->Spring->Fall Persistence of Students Testing into One or More DE Subject Areas

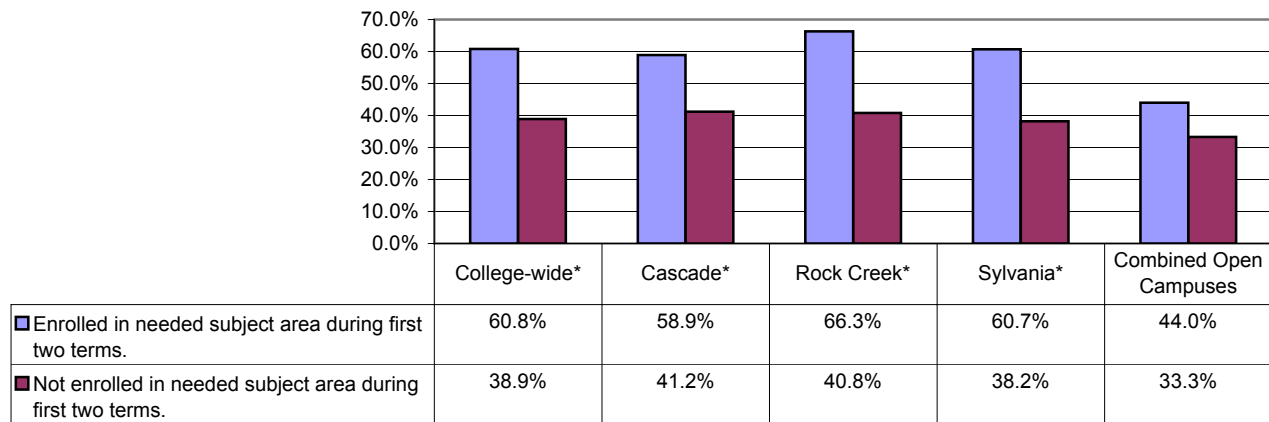


*Differences were statistically significant.

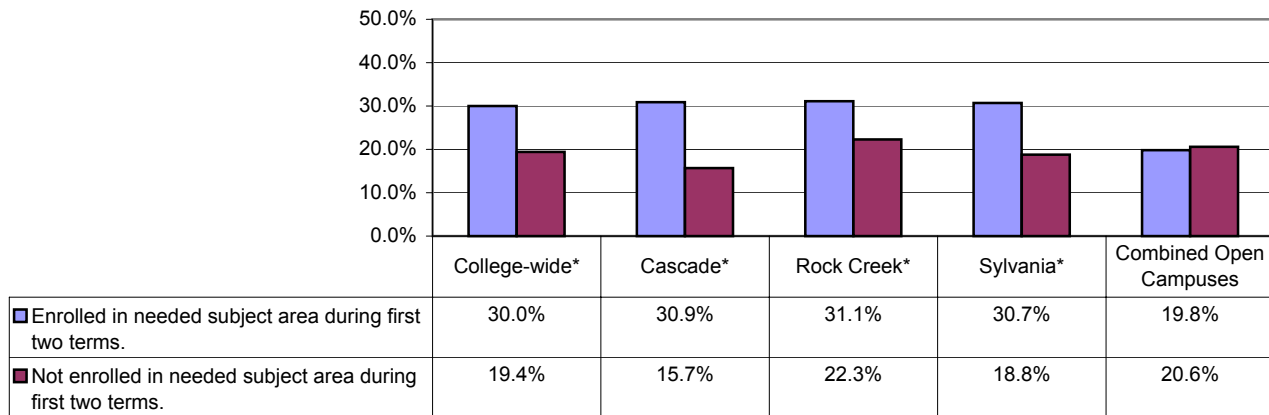
Fall->Winter Persistence of Students Testing into One DE Subject Area



Fall->Winter->Spring Persistence of Students Testing into One DE Subject Area

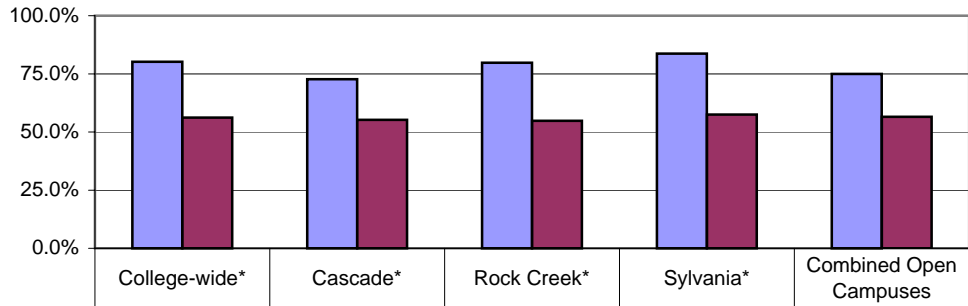


Fall->Winter->Spring->Fall Persistence of Students Testing into One DE Subject Area



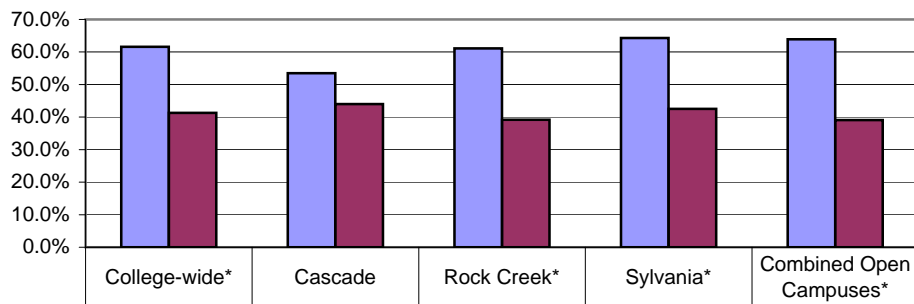
*Differences were statistically significant.

Fall->Winter Persistence of Students Testing into Two DE Subject Areas



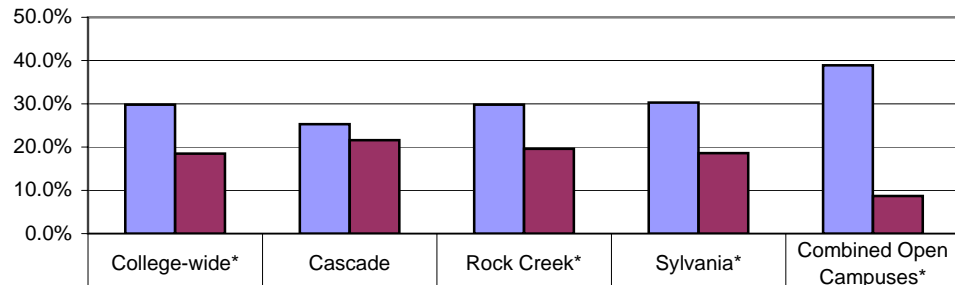
Enrolled in all needed subject areas during first two terms.	80.2%	72.7%	79.8%	83.7%	75.0%
Not enrolled in needed subject areas during first two terms.	56.2%	55.2%	54.8%	57.5%	56.5%

Fall->Winter->Spring Persistence of Students Testing into Two DE Subject Areas



Enrolled in all needed subject areas during first two terms.	61.6%	53.5%	61.1%	64.3%	63.9%
Not enrolled in needed subject areas during first two terms.	41.3%	44.0%	39.2%	42.5%	39.1%

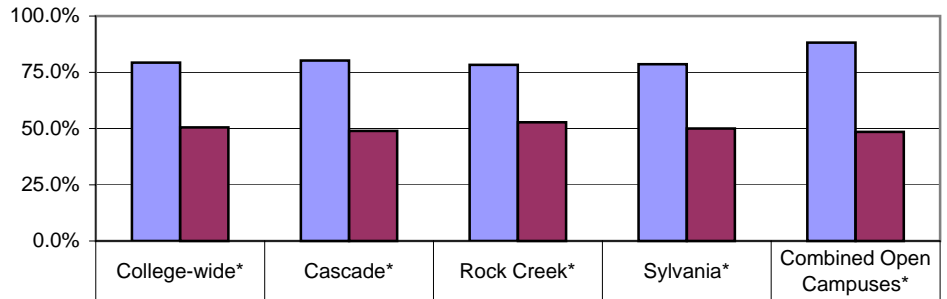
Fall->Winter->Spring->Fall Persistence of Students Testing into Two DE Subject Areas



Enrolled in all needed subject areas during first two terms.	29.8%	25.3%	29.8%	30.3%	38.9%
Not enrolled in needed subject areas during first two terms.	18.5%	21.6%	19.6%	18.6%	8.7%

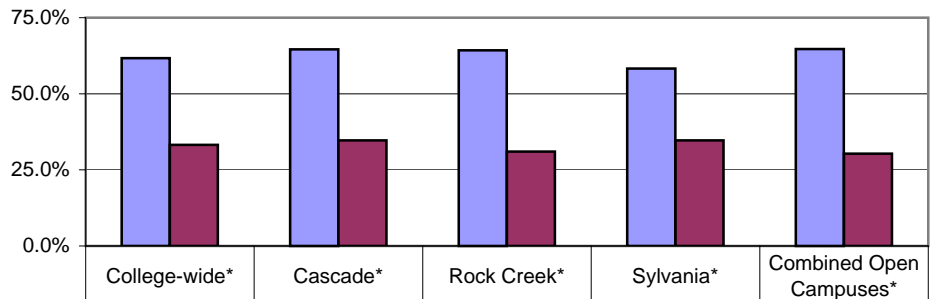
* Differences were statistically significant.

Fall->Winter Persistence of Students Testing into Three DE Subject Areas



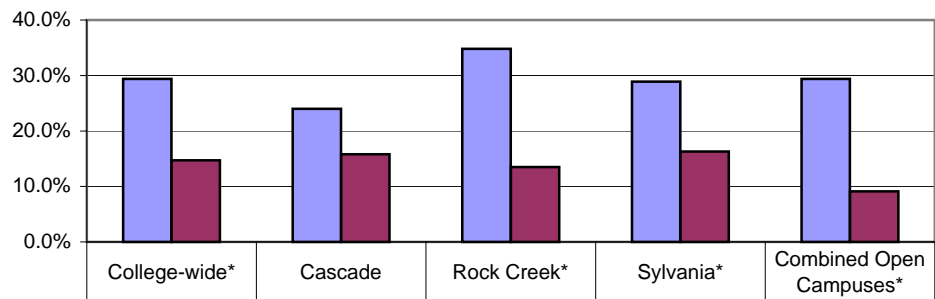
Enrolled in all needed subject areas during first two terms.	79.3%	80.2%	78.3%	78.6%	88.2%
Not enrolled in needed subject areas during first two terms.	50.5%	48.9%	52.8%	50.0%	48.5%

Fall->Winter->Spring Persistence of Students Testing into Three DE Subject Areas



Enrolled in all needed subject areas during first two terms.	61.7%	64.6%	64.3%	58.3%	64.7%
Not enrolled in needed subject areas during first two terms.	33.2%	34.7%	31.0%	34.7%	30.3%

Fall->Winter->Spring->Fall Persistence of Students Testing into Three DE Subject Areas



Enrolled in all needed subject areas during first two terms.	29.4%	24.0%	34.8%	28.9%	29.4%
Not enrolled in needed subject areas during first two terms.	14.7%	15.8%	13.5%	16.3%	9.1%

*Differences were statistically significant.

Appendix B

Developmental Education Course Taking Patterns and the Persistence of Students Who Tested into One, Two or Three DE Subject Areas: Fall 1999, Fall 2000 and Fall 2001.

Fall to Winter Persistence of Freshmen New to PCC Who Tested into One or More DE Subject Areas

	College-wide*	Cascade*	Rock Creek*	Sylvania*	Combined Open Campuses*
Enrolled in all needed subject areas during first two terms.	77.7%	75.7%	79.4%	78.6%	68.1%
Not enrolled in needed subject areas during first two terms.	53.2%	52.5%	54.3%	53.7%	48.5%

* Differences in persistence rates were statistically significant College-wide and for all campuses.

Fall through Spring Persistence of Freshmen New to PCC Who Tested into One or More DE Subject Areas

	College-wide*	Cascade*	Rock Creek*	Sylvania*	Combined Open Campuses*
Enrolled in all needed subject areas during first two terms.	61.2%	58.9%	64.4%	61.3%	51.4%
Not enrolled in needed subject areas during first two terms.	37.7%	39.0%	36.8%	38.6%	34.3%

* Differences in persistence rates were statistically significant College-wide and for all campuses.

Fall through the Following Fall Persistence of Freshmen New to PCC Who Tested into One or More DE Subject Areas

	College-wide*	Cascade*	Rock Creek*	Sylvania*	Combined Open Campuses*
Enrolled in all needed subject areas during first two terms.	29.8%	27.6%	31.3%	30.3%	25.7%
Not enrolled in needed subject areas during first two terms.	17.5%	17.4%	18.2%	17.9%	12.6%

* Differences in persistence rates were statistically significant College-wide and for all campuses.

Developmental Education Course Taking Patterns and the Persistence of Students Who Tested into One DE Subject Area: Fall 1999, Fall 2000 and Fall 2001.

Fall to Winter Persistence of Freshmen New to PCC Who Tested into One DE Subject area

	College-wide*	Cascade*	Rock Creek*	Sylvania*	Combined Open Campuses*
Enrolled in needed subject area during first two terms.	75.7%	74.9%	79.6%	75.9%	61.5%
Not enrolled in needed subject area during first two terms.	53.0%	55.9%	55.3%	53.3%	39.7%

* Differences in persistence rates were statistically significant College-wide and for all campuses.

Fall through Spring Persistence of Freshmen New to PCC Who Tested into One DE Subject Area

	College-wide*	Cascade*	Rock Creek*	Sylvania*	Combined Open Campuses
Enrolled in needed subject area during first two terms.	60.8%	58.9%	66.3%	60.7%	44.0%
Not enrolled in needed subject area during first two terms.	38.9%	41.2%	40.8%	38.2%	33.3%

* Differences in persistence rates were statistically significant College-wide and for the Cascade, Rock Creek and Sylvania campuses.

Fall through the Following Fall Persistence of Freshmen New to PCC Who Tested into One DE Subject Area

	College-wide*	Cascade*	Rock Creek*	Sylvania*	Combined Open Campuses
Enrolled in needed subject area during first two terms.	30.0%	30.9%	31.1%	30.7%	19.8%
Not enrolled in needed subject area during first two terms.	19.4%	15.7%	22.3%	18.8%	20.6%

* Differences in persistence rates were statistically significant College-wide and for the Cascade, Rock Creek and Sylvania campuses.

Developmental Education Course Taking Patterns and the Persistence of Students Who Tested into Two DE Subject Areas: Fall 1999, Fall 2000 and Fall 2001.

Fall to Winter Persistence of Freshmen New to PCC Who Tested into Two DE Subject Areas

	College-wide*	Cascade*	Rock Creek*	Sylvania*	Combined Open Campuses
Enrolled in all needed subject areas during first two terms.	80.2%	72.7%	79.8%	83.7%	75.0%
Not enrolled in needed subject areas during first two terms.	56.2%	55.2%	54.8%	57.5%	56.5%

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Fall through Spring Persistence of Freshmen New to PCC Who Tested into Two DE Subject Areas

	College-wide*	Cascade	Rock Creek*	Sylvania*	Combined Open Campuses*
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* Differences in persistence rates were statistically significant College-wide and for the Rock Creek, Sylvania and Combined Open campuses.

Fall through the Following Fall Persistence of Freshmen New to PCC Who Tested into Two DE Subject Areas

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* Differences in persistence rates were statistically significant College-wide and for the Rock Creek, Sylvania and Combined Open campuses.

Developmental Education Course Taking Patterns and the Persistence of Students Who Tested into Three DE Subject Areas: Fall 1999, Fall 2000 and Fall 2001.

Fall to Winter Persistence of Freshmen New to PCC Who Tested into Three DE Subject Areas

	College-wide*	Cascade*	Rock Creek*	Sylvania*	Combined Open Campuses*
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Not enrolled in needed subject areas during first two terms.	50.5%	48.9%	52.8%	50.0%	48.5%

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Fall through Spring Persistence of Freshmen New to PCC Who Tested into Three DE Subject Areas

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