



Math Completion Patterns for Students of Concern

The purpose of this report is to describe the math completion patterns and persistence rates for students who are flagged by Admissions as a Student of Concern or have test scores that put them at the remedial level for math, reading, or writing.

Executive Summary

Students that are flagged as a Student of Concern (SOC) or have assessment scores that are below the CDHE cutoff for college readiness have very low persistence rates at CSU. These students also have low rates of placing into College Algebra and have large proportions of students that do not complete a math course (CSU or transfer) within the first year. The persistence rates are particularly low for the students who avoid math. Supplemental math instruction could be one intervention to assist students in successfully completing their program of study's AUCC math requirement and possibly increasing this group's persistence and graduation rates. The number of students who would qualify for the math intervention is substantial and would the overall graduation rates at CSU.

Population

The population in this report includes first-time, full-time (FTFT) students from the FA14-FA16 cohorts who have an SOC flag or are remedial in reading, math, or writing (defined by CDHE as having assessment scores that are below the college-ready cut scores¹). Admissions uses the SOC flag to identify students who, for a variety of reasons, have elements of their application that indicate they might have trouble adjusting to CSU. The SOC flag only became available in FA14 and forward.

There is a large overlap between the remedial status students and SOC, about 67% of the SOC students have an assessment score that is below the cutoff in one or more subject areas (compared to only about 8% of the entire FTFT cohort with a score below the cutoff). Among the remediation students, about 71% have a math assessment score that is below the cutoff. Among these students, 81%, are remedial in math only (19% have scores below the cutoff in math and reading and/or writing). A Venn diagram with the distribution of students by remediation subject can be viewed in the Appendix. Table 1, below, displays the headcount of students by remedial/SOC status for three cohorts included in this study.

Table 1.

Remedial / SOC New Freshmen Headcount

	FA14	FA15	FA16
Remedial (not SOC)	262	400	186
SOC (not Remedial)	58	69	425
Both	36	30	204
Total	356	499	815

The population from FA14 has grown. In FA14 remedial and / or SOC students were about 8% of the FTFT cohort and in FA16 this group is approximately 17% of the FTFT cohort. The growth is entirely among the SOC students who do not have a remedial flag. The representation of remedial students is approximately the same across all three cohorts.

¹ CDHE defines college-readiness by ACT sub scores that are equal to or higher than 19 in Math, 18 in English, and 17 in reading
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Persistence and Graduation

This population of students is important in terms of student success efforts because prior work on students with assessment scores below the CDHE cutoff show considerably lower graduation rates ([report link](#)). This is an older report but the pattern has remained consistent; for instance, among the FA10 cohort, the 6-year graduation rate for students with a test score below the cutoff is about 11.5 percentage points lower than students whose test scores are higher than the cutoff (67.8% compared to 56.3%). Graduation rates are unavailable for the SOC students because this is a relatively new identification process.

The persistence rates of students who are flagged as a student of concern or with a remedial flag are also low. The second fall persistence is 76.2% for this report's FA15 population (compared to the overall rate of about 86.2%) and the third fall persistence for this report's FA14 population is 65.7% (compared to the overall rate of about 78.4%).

Math Completion Patterns

SOC / remedial students are not engaging with the math process in a timely manner to meet AUCC requirements for math at CSU. Table 2, below, displays the headcounts for the SOC / remedial students in by MPE placement and first math course status. First math course status measures whether the first math course is taken at CSU or transferred in. No math indicates that the student does not have a math course in their system of record; therefore, for the FA14 cohort that specifies they haven't completed any math in their first two years.

Table 2.

Headcounts for SOC / Remedial Students in FA14-FA16 FTFT Cohorts by Math Status

MPE Placement / First Math Course	FA14	FA15	FA16
Placed into MATH117	124	199	278
1st Math at CSU	116	187	228
1st Math is a Transfer Course	5	6	18
No Math	3	6	32
Did not place into MATH117	186	245	354
1st Math at CSU	121	130	122
1st Math is a Transfer Course	14	11	8
No Math	51	104	224
Have not taken MPE	46	55	183
1st Math at CSU	0	1	0
1st Math is a Transfer Course	22	20	53
No Math	24	34	130
Overall Total	356	499	815

A relatively large proportion of these students are not taking the MPE in a timely manner, about 11% (55/499) of the FA15 cohort and 13% (46/356) of the FA14 cohort have not taken their MPE (about 23% of the FA16 cohort hasn't taken MPE; however, this proportion will continue to increase). Additionally, math avoidance is particularly high among the students that don't place into MATH117 (57% across all three cohorts among students that take the MPE). About 27% (51/186) of the FA14 cohort that did not place into MATH117 have not completed math in their first two years and about 42% (104/245) of the FA14 cohort that did not place into MATH117 have not completed math in their first year.

It is also important to note that the raw headcount of these students could have a substantial impact on overall graduation rates. It would take about 45 students to make a pone percentage point difference in the overall graduation



rate. The 104 students in FA15 who did not place into MATH117 and have not taken math could contribute up to two percentage points in the overall graduation rates at CSU.

Associations between Math Completion and Persistence

Prior work at CSU shows a strong positive association between timely math completion and persistence through graduation ([link](#)) and this association is consistent for all demographic groups ([link](#)). Table 3, below, displays the FA16 persistence rates for the SOC / remedial students in the FA14 and FA15 cohorts by MPE placement and first math course status.

Table 3.

FA16 Persistence for SOC / Remedial Students in FA14 & FA15 FTFT Cohorts

MPE Placement / First Math Source	3rd Fall Persistence	2nd Fall Persistence
Placed into MATH117	77%	83%
1st Math at CSU	78%	84%
1st Math is a transfer course	80%	83%
No Math	0%	33%
Did not place into MATH117	62%	72%
1st Math at CSU	76%	88%
1st Math is a transfer course	93%	91%
No Math	22%	50%
Have not taken MPE	50%	69%
1st Math at CSU	0%	0%
1st Math is a transfer course	77%	95%
No Math	25%	56%
Overall Total	66%	76%

Among SOC/remedial students the persistence rates are lowest for students who don't take the MPE (69% of FA15 persist to FA16 and 50% of FA14 persist to FA16). The rates are also lower for those who do not place into MATH117 (72% of FA15 persist to FA16 and 62% of FA14 persist to FA16) and the rates are highest for those that do place into MATH117 (83% of FA15 persist to FA16 and 77% of FA14 persist to FA16). Regardless of MPE result, the persistence rates are lowest for students who do not have a math course in the system of record. This indicates a positive association between completing math and persistence among students with low ACT/SAT math scores.

Recommendations

Students who are flagged as a SOC have high rates of assessment scores that are below the CDHE cutoff for college readiness in the subject of math. A majority, 57%, of these students who take the MPE don't place into MATH117 and the persistence rates are considerably low for this group. Some intentional math intervention, possibly in the form of supplemental instruction, could encourage these students to complete a math course in a timely manner and might increase their persistence to the second and third fall semesters. After considering the raw numbers, increasing the persistence rates among these students could have a substantial percentage point increase in the overall graduation rates at CSU.



Appendix: Distribution of FA14-FA16 SOC or Remedial Students by Remediation Subject

