To: Jerry Rosenberg, Physical Science, Math and Engineering Dean, Elvin Ramos, Social Sciences and Humanities Dean, and Yvette Alves-Campbell, STEM Director

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Subject: Evaluation of the Statistics Pathway - Success and Throughput Rates

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Purpose

This analysis is provided as an update on the success and throughput rates for courses in the Statistics pathway which includes MATH10 as a standalone course, MATH10X with a corequisite, SOC/PSYC15 which meets the same math transfer requirements as MATH10, MATH109 the pre-stats preparation course, as well as the few sections of MATH210 and 212 still offered. AB 705 states that colleges have two years to pilot innovative curriculum that places students into multi-term sequences or basic skills sequences. We have completed the first year of the two-year process. **Throughput rates** for quarter schools are calculated based on three terms. Under AB 705, students are given 3 terms to complete the transfer level or degree applicable course and the clock starts at first enrollment in the sequence. This analysis tracks students who have no prior math enrollment and tracks their initial course enrollment through the transfer (MATH10, 11, 44, 46, or PSYC/SOC15) or degree applicable course (MATH114) based on their educational goal. Both two and three-term throughput from fall 2019 to winter 2020 and fall 2019 to spring 2020.

It should be noted that **online spring has impacted outcomes for students** in that students largely took an excused withdrawal rather than a standard withdrawal for spring 2020. For this reason, the EW grades were included in this analysis to ensure consistency across terms in regards to withdraws and how they are calculated within the success rate. A full analysis of EW grades and their impact on success rates in spring 2020 is available here.

AB 705 Context

AB 705 (Irwin), Title 5, § 55003 and 55522 requires California Community Colleges' placement methods to be designed to maximize the probability that students will enter and complete transfer-level coursework in English and mathematics (or quantitative reasoning) within one year. Colleges are required to evaluate the following scenarios:

1. Students enroll in a pre-transfer level course with an educational goal of transfer;
2. Students enroll in a pre-degree-level course with an educational goal of degree; or
3. Students enroll in a pre-degree-level course with an educational goal of certificate that requires transfer level English or degree-applicable math; or
4. Students with a transfer or degree goal enroll in a multi-term sequence in which they take either (1) a pre-transfer-level course in one term and a transfer-level course in a following term or (2) a transfer-level course stretched over two terms (e.g. stretch curriculum).

Summary of Findings

1. SOC/PSYC15 has the highest throughput rate for all high school GPA groups, but has the highest enrollment in the top and middle GPA bands.
2. MATH10 as an MPS section has the highest throughput rate for students at 78%, this is followed by MATH10 non-MPS at 75% and MATH10 +210X which has a throughput rate of 70%.
3. Students with an educational goal of transfer who start in MATH109, MATH210 or MATH212 are not maximizing the likelihood of completing MATH10 in one year, as the throughput rates for all three courses are below that of MATH10 + 210X at 0% for MATH109, 9% for MATH210 and 15% for MATH212.
4. At this time, and **with the limited sample sizes**, MATH109, MATH210 and MATH212 are not meeting the intended purpose under title 5, § 55003.d.3. where students in a pre-transfer level course or a corequisite course should be exhibiting throughput rates at or above those of students in the same GPA band who enrolled in the non-MPS course, or above 50%.
5. There are signs of over-representation of African American and Latinx students in the basic skills math courses as well as the corequisite courses, this can be problematic for these student populations since throughput is lower for these courses than the Standalone sections and should be monitored. While Asian students tend to be enrolled in the standalone MATH10 section at the highest rate with very few enrollments in the basic skills or corequisite sections.

Table 1. Statistics Pathway Throughput Rates

	Fall 2019			Winter 2020				Spring 2020			
	Fall 2019 Enrolled	Fall 2019 Passed	Fall 2019 Success Rate	Winter 2020 Enrolled	Winter 2020 Passed	Winter 2020 Success Rate	Two-term Throughput Rate	Spring 2020 Enrolled	Spring 2020 Passed	Spring 2020 Success Rate	Three-term Throughput Rate
Transfer Level Completion											
MATH10 Overall	1,427	993	70%	74	40	54%	72%	82	46	56%	76%
MATH10 + Non-MPS	1,280	880	69%	70	40	57%	72%	78	44	56%	75%
MATH10 + MPS	147	113	77%	4	0	0%	77%	4	2	50%	78%
MATH10 + 210x	107	68	64%	9	3	33%	66%	8	4	50%	70%
SOC/PSYC15	36	29	81%	1	1	100%	83%	4	4	100%	94%
MATH109	2	1	50%								0%
MATH210	34	18	53%	2	0	0%	0%	3	3	100%	9%
MATH212	34	18	53%	3	3	100%	9%	2	2	100%	15%
Degree Applicable Completion											
MATH109	3	1	33%								0%
MATH210	7	2	29%					1	1	100%	14%
MATH212	8	4	50%	3	3	100%	38%				38%

Note: Includes students with no prior math enrollment. Transfer level completion for MATH10 and MATH10 + 210x includes students with any educational goal as their course taking behavior indicates a transfer goal intention by enrolling in a transfer level course. Students are tracked to completion of MATH10, 11, 44 or 46 or PSYC/SOC15. Transfer level completion for MATH109, MATH210 or MATH212 includes students with an educational goal of transfer tracked to MATH10, 11, 44 or 46 or PSCY/SOC15. Degree applicable completion includes students with a degree educational goal who completed MATH114. MATH109 had 14 total enrollments in fall 2019, of which 5 students had no prior math enrollment

Table 1 displays the two and three-term throughput rates for the different Statistics pathways. Students who enrolled in a math class for the first time in fall 2019 are tracked to successful completion (A, B, C, P) of the transfer level (MATH10, 11, 44 or 46 or PSCY/SOC15) or degree applicable (MATH114) course by winter and spring 2020.

- Students who started in MATH10 in fall 2019 and passed a transfer level course by spring 2020 resulted in a three-term throughput rate of 76%.
    - When broken out by MPS and non-MPS sections, MPS sections had throughput rates of 78% compared to 75% for non-MPS sections.
- Students who started in PSYC/SOC15 and passed the course or MATH10 by spring 2020 resulted in a three-term throughput rate of 94%.
- Students who started in MATH10 +210x in fall 2019 and passed MATH10 or equivalent by spring 2020 resulted in a three-term throughput rate of 70%.
- No students who started in MATH109 in fall 2019 passed MATH10 or equivalent by spring 2020.
- Students who started in MATH210 with a goal of transfer in fall 2020 and passed MATH10 or equivalent by spring 2020 resulted in a three-term throughput rate of 9%.
    - Students with an educational goal of degree had a throughput rate of 14% when tracked to MATH114.
- Students who started in MATH212 with an educational goal of transfer in fall 2020 and passed MATH10 or equivalent by spring 2020 resulted in a three-term throughput rate of 15%.
    - Students with an educational goal of degree had a throughput rate of 38% when tracking to MATH114.

Table 2. Statistics Pathway Throughput Rates by High School GPA Band

		Fall 2019			Winter 2020				Spring 2020			
Cumulative High School GPA	Course Type	Fall 2019 Enrolled	Fall 2019 Passed	Fall 2019 Success Rate	Winter 2020 Re-Enrolled	Winter 2020 Passed	Winter 2020 Success Rate	Two-term Throughput Rate	Spring 2020 Re-Enrolled	Spring 2020 Passed	Spring 2020 Success Rate	Three-term Throughput Rate
3.0 or above	MATH10 non-MPS	591	451	76%	26	17	65%	79%	23	14	61%	79%
	MATH10 MPS	56	51	91%	2	0	0%	91%				91%
	MATH10 + 210x	51	45	88%	1	1	100%	90%	2	1	50%	92%
	SOC/PSYC15	22	20	91%					2	2	100%	100%
	MATH109	2	1	50%								0%
	MATH210	8	3	38%								0%
	MATH212	5	4	80%	1	1	100%	20%	1	1	100%	40%
2.3 - 2.9	MATH10 non-MPS	307	154	50%	25	15	60%	55%	32	14	44%	55%
	MATH10 MPS	41	30	73%				73%	2	2	100%	78%
	MATH10 + 210x	26	11	42%	3	1	33%	46%	3	1	33%	47%
	SOC/PSYC15	6	4	67%	1	1	100%	83%				83%
	MATH109											
	MATH210	8	5	63%	1	0	0%	0%				0%
	MATH212	8	0	0%								0%
Less than 2.3	MATH10 non-MPS	69	16	23%	10	3	30%	28%	12	8	67%	39%
	MATH10 MPS	23	12	52%	1	0	0%	52%	2	0	0%	52%
	MATH10 + 210x	18	5	28%	5	1	0%	33%	2	2	0%	44%
	SOC/PSYC15											
	MATH109											
	MATH210	4	2	50%					1	1	100%	25%
	MATH212	6	2	33%								0%
No GPA	MATH10 non-MPS	313	259	83%	9	5	56%	84%	11	8	73%	87%
	MATH10 MPS	27	20	74%	1	0	0%	74%				74%
	MATH10 + 210x	12	7	58%				58%	1	0	0%	58%
	SOC/PSYC15	8	5	63%				63%	2	2	100%	88%
	MATH109											
	MATH210	14	8	57%	1	0	0%	0%	1	1	100%	7%
	MATH212	15	12	80%	2	2	100%	13%	1	1	100%	20%

Note: MATH10 and SOC/PSYC15 includes all student educational goals as their intent to transfer is exhibited by their behavior in taking a transfer level course. MATH109, 210 and 212 include students with an educational goal of transfer and tracks students though completion of MATH10, 11, 44 and 46 or PSYC/SOC15. High school GPA data was not available for 24% of students in MATH10 non-MPS, 18% of students in MATH10 MPS, 11% for students in MATH10 +210x,22% of students in PSYC/SOC15, 0% of students in MATH109, 41% of students in MATH210 and 54% of students in MATH212. GPA is obtained from official transcripts first, then supplemented by self-reported if available.

Table 2 displays the two and three-term throughput rates for the different Statistics pathways by high school GPA band. Students who enrolled in a math class for the first time in fall 2019 are tracked to successful completion (A, B, C, P) of the transfer level (MATH10, 11, 44 or 46 or PSCY/SOC15) or degree applicable (MATH114) course by winter and spring 2020.

- When disaggregating by high school GPA band, SOC/PSYC15 has the highest throughput rate for all high school GPA groups, but has the highest enrollment in the top and middle GPA bands, not in the lowest band.

- MATH10 as an MPS section has the highest throughput rate for all student groups after SOC/PSYC15 and has the greatest impact on students in the lowest and middle GPA bands with a 13 % point increase in throughput from the non-MPS section for students with less than a 2.3 GPA and a 23 % point increase for students between a 2.3 and 2.9 GPA.

- MATH10 +210x which is intended for students in the lowest GPA band outperforms MATH10 non-MPS by 5 % points, but does not outperform MPS, where there is a 12 % point gap between the two modalities.

- MATH109 has an extremely small sample size of 2 students with an educational goal of transfer in the highest GPA band of 3.0 or higher, and neither of these students successfully completed the transfer level course.

- MATH210 also has a small sample size of 34 students, but consistently has a throughput rate at or below 25%. The 8 students in the each of the highest and middle GPA bands with a transfer educational goal did not complete MATH10 in one year for a throughput rate of 0%. Students in the lowest GPA band (4) had a throughput of 25% and students with no GPA on file, which was the largest sample size of 14 had a throughput rate of 7%.

- Throughput rates for MATH212 were 40% and lower. Students in the highest GPA band (8) had a throughput rate of 40%. No students in the middle (8) or lowest (6) GPA bands completed the transfer level course. The largest group of students with no high school GPA on file (15) had a throughput rate of 20%.

- At this time, and with the small sample sizes available, MATH109, MATH210 and MATH212 are not meeting the intended purpose under title 5, § 55003.d.3. However, the law permits colleges to pilot innovative curriculum for two years. Students in the middle and lowest GPA band in MATH109, MATH210 and MATH212 should be exhibiting throughput rates at or above those of students in the same GPA band who enrolled in MATH10+210x course. The two-year timeframe can allow for larger sample sizes for comparison over time. If these rates are not met within two years, title 5 states: The Chancellor may order the district to relinquish the district method and adopt a method

published by the Chancellor's Office under any of the following circumstances: the district's failure to demonstrate that the local method meets or exceeds the throughput rate of a method published by the Chancellor's Office.

Table 3. Statistics Pathway Success Rates by Course Type and Term

	Success		Non Success		Withdraw		Total	
Fall 2019	Grades	Percent	Grades	Percent	Grades	Percent	Grades	Percent
MATH10 non-MPS	975	67%	292	20%	181	13%	1,448	100%
MATH10 MPS	131	74%	28	16%	19	11%	178	100%
MATH10 + Coreq	78	63%	31	25%	14	11%	123	100%
MATH109	9	64%	3	21%	2	14%	14	100%
MATH210	32	53%	20	33%	8	13%	60	100%
MATH212	41	47%	35	40%	12	14%	88	100%
SOC/PSYC15	53	87%	5	8%	3	5%	61	100%
Winter 2020								
MATH10 non-MPS	717	70%	120	12%	183	18%	1020	100%
MATH10 MPS	146	78%	23	12%	17	9%	186	100%
MATH10 + Coreq	88	75%	18	15%	12	10%	118	100%
MATH210	17	74%	6	26%			23	100%
MATH212	37	67%	5	9%	13	24%	55	100%
SOC/PSYC15	86	89%	3	3%	8	8%	97	100%
Spring 2020								
MATH10 non-MPS	659	71%	122	13%	144	16%	925	100%
MATH10 MPS	130	73%	18	10%	31	17%	179	100%
MATH10 + Coreq	55	76%	12	17%	5	7%	72	100%
MATH109	13	62%	4	19%	4	19%	21	100%
MATH210	20	74%	5	19%	2	7%	27	100%
MATH212	32	70%	10	22%	4	9%	46	100%
SOC/PSYC15	83	89%	2	2%	8	9%	93	100%

Table 3 displays success rates by course type for all course enrollments.

- Success rates are highest for SOC/PSYC15 sections with success rates in the high-80% range.
- MPS sections of MATH10 are the next highest success rates compared in the fall and winter.
- MATH10 + 210x in the spring has the next highest success rate after SOC/PSYC15.

Table 4. Statistics Pathway Enrollment by Race/Ethnicity

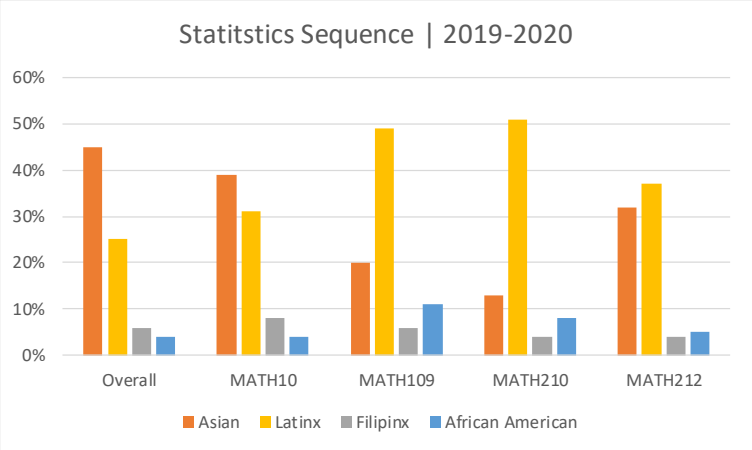
	Overall Population		MATH10 non-MPS		MATH10 MPS		MATH10X Coreq		SOC/PSYC15		MATH109		MATH210		MATH212	
Fall 2019	Grades	Percent	Grades	Percent	Grades	Percent	Grades	Percent	Grades	Percent	Grades	Percent	Grades	Percent	Grades	Percent
African American	712	4%	59	4%	7	4%	6	5%	3	5%	1	7%	5	8%	5	6%
Asian	7,746	44%	622	43%	41	23%	35	28%	31	50%	3	21%	7	12%	33	38%
Filipinx	1,257	6%	115	8%	9	5%	10	8%			1	7%	2	3%	4	5%
Latinx	5,174	27%	401	28%	97	54%	55	45%	14	23%	7	50%	31	52%	32	36%
Native American	59	0%	3	0%	1	1%										
Pacific Islander	156	1%	20	1%	2	1%	1	1%			1	7%	3	5%	1	1%
White	3,387	16%	195	14%	18	10%	14	11%	13	21%	1	7%	12	20%	12	14%
Decline to State	396	2%	33	2%	3	2%	2	2%	1	2%					1	1%
Total	18,887	100%	1,448	100%	178	100%	123	100%	62	100%	14	99%	60	100%	88	100%
Winter 2020																
African American	620	4%	37	4%	8	4%	4	3%	3	3%			1	4%	2	4%
Asian	7,316	45%	423	41%	45	24%	43	36%	38	39%			3	13%	14	25%
Filipinx	1,130	6%	79	8%	10	5%	11	9%	3	3%			2	9%	1	2%
Latinx	4,421	25%	300	29%	96	52%	41	35%	35	36%			11	48%	22	40%
Native American	53	0%	4	0%									1	4%		
Pacific Islander	127	1%	6	1%	2	1%	1	1%	4	4%			1	4%		
White	3,200	16%	150	15%	22	12%	17	14%	14	14%			4	17%	16	29%
Decline to State	483	3%	21	2%	3	2%	1	1%								
Total	17,350	100%	1,020	100%	186	100%	118	100%	97	100%	0	0%	23	99%	55	100%
Spring 2020																
African American	595	4%	33	4%	12	7%	1	1%	3	3%	3	14%	3	11%	3	7%
Asian	7,059	45%	378	41%	48	27%	20	28%	34	37%	4	19%	4	15%	13	28%
Filipinx	1,052	6%	74	8%	6	3%	5	7%	5	5%	1	5%			2	4%
Latinx	4,170	24%	237	26%	76	42%	31	43%	33	35%	10	48%	14	52%	15	33%
Native American	65	0%	2	0%	1	1%	1	1%					1	4%		
Pacific Islander	122	1%	10	1%	6	3%			1	1%	1	5%			1	2%
White	2,867	16%	141	15%	23	13%	6	8%	15	16%	2	10%	4	15%	8	17%
Decline to State	688	4%	50	5%	7	4%	8	11%	2	2%			1	4%	4	9%
Total	16,618	100%	925	100%	179	100%	72	100%	72	100%	21	100%	27	100%	46	100%

Legend: Salmon color represents underrepresentation of the group based on their enrollment in the course compared to the overall enrollment on campus in the same term. Blue indicates an overrepresentation in enrollment.

Table 4 displays the total percent of each racial/ethnic group in each term followed by their proportion of enrollment in each Math course on the Statistics pathway.

- There are signs of over-representation of African American and Latinx students in the basic skills math courses as well as the corequisite courses, this can be problematic for these student populations since throughput is lower for these courses than the Standalone sections and should be monitored. While Asian students tend to be enrolled in the standalone MATH10 section at the highest rate with very few enrollments in the basic skills or corequisite sections.

Chart 1. Statistics Pathway Enrollment by Race/Ethnicity – 2019-20



As displayed above in Chart 1, Asian student enrollment in the statistics sequence is highest in transfer level MATH10 and lowest in pre-transfer level MATH210. Enrollment for Latinx students is the inverse, where it is highest in the pre-transfer level courses of MATH10, MATH210 and MATH212 and lowest in MATH10. African American enrollment follows the same trend as Latinx with the highest enrollment in basic skills and lowest in transfer level.