

Mathematics Department Meeting

Agenda – Tuesday, September 8, 2020 3:00pm – 4:00pm

- 1. MESA/S-STEM
- 2. Campus Climate Survey
- 3. Math Success Rates
- 4. Math Department Mission (Samples)
 - a. SBVC Mission
 - i. San Bernardino Valley College maintains a culture of continuous improvement and a commitment to provide high-quality education, innovative instruction, and services to a diverse community of learners.
 - b. To provide an equity-mindedness environment where students can learn, gain sufficient understanding and experiences of mathematics to pursue their career, develop mathematical thinking, encourage life-long learning, and acquire functional math skills to enhance productive citizenry.
 - c. In fulfilling this mission, the department creates an environment where the faculty can continue to grow as professionals and scholars, while providing public and discipline related service.
- 5. Program Outcome Mapping
- 6. Student Learning Outcomes
- 7. ISER
- 8. Other



Research, Planning & Institutional Effectiveness

Request Placed: 6/17/2020 by Dr. S. Lewis Request Received: 6/18/2020 by CGM Request Completed: 7/29/2020 by CGM Completion Time Requested: ASAP

Request: Math success rates disaggregated by ethnicity, gender, and course for F2017, F2018 and F2019.

Results: Tables 1 shows the percentages of students who received A's, B's, C's and P grades (Success Rates). Table 2 shows the percentage of students who remained enrolled in the course with and received any grade on record (Retention Rates). The most recent fall term, in green font data, identifies improvements over 5% from the previous term, and red data shows a performance decline greater than 10%. Psych 105 – Statistics for the Behavioral Sciences was added to the tables due to its compatibility with Math 108 – Introduction to Statistics and Probability and successful, common fit with SLAM (Statistics and Liberal Arts Math). ¹

Table 1. Total Success

Math Course Success Rates							
Fall Terms	2017	2018	2019				
Math Course	Success	Success	Success				
942	68.9%	59.5%	n/a				
952	73.5%	83.4%	n/a				
962	78.2%	65.3%	33.8%				
090	52.6%	56.4%	n/a				
095	61.1%	63.3%	39.1%				
096	n/a	n/a	34.8%				
102	52.2%	62.9%	37.4%				
103	49.5%	49.6%	48.4%				
108	63.0%	56.8%	55.3%				
115	54.2%	70.0%	64.2%				
141	n/a	n/a	81.8%				
151	63.4%	50.6%	56.9%				
250	58.8%	54.1%	55.0%				
251	52.8%	59.7%	48.7%				
252	90.0%	78.6%	88.9%				
265	n/a	28.6%	77.3%				
266	88.9%	50.0%	90.2%				
Psych-105	61.3%	68.8%	67.6%				

n/a = 5 or less students

Table 2. Total Retention

Math Course Retention Rates						
Fall Terms	2017	2018	2019			
Math Course	Retention	Retention	Retention			
942	92.1%	92.3%	n/a			
952	94.8%	93.8%	n/a			
962	94.6%	92.6%	75.2%			
090	87.4%	88.6%	n/a			
095	88.9%	91.3%	81.2%			
096	n/a	n/a	79.7%			
102	84.9%	86.4%	80.8%			
103	82.5%	82.9%	82.1%			
108	81.9%	81.4%	87.0%			
115	83.3%	83.3%	92.7%			
141	n/a	n/a	81.8%			
151	91.5%	80.9%	88.1%			
250	91.2%	87.8%	91.6%			
251	83.3%	85.5%	75.0%			
252	90.0%	85.7%	94.4%			
265	n/a	92.9%	93.2%			
266	88.9%	75.0%	97.6%			
Psych-105	96.8%	100.0%	91.0%			

Table 3 shows student performance measures disaggregated by STEM vs SLAM declared majors. ² STEM majors outperformed SLAM majors by 11.4% points in 102 – College Algebra and 24.6% points in 151 – Precalculus and had retention rates 21.1% percentage rates higher. SLAM majors outperformed STEM majors in Psy-105 by 9.7% points and retention rates were also higher for SLAM majors by 24.1% points. However, SLAM majors had higher success and retention rates (8.2% points) compared with STEM majors in 103 – Plane Trigonometry, a finding not supporting the typical community college STEM/SLAM course curriculum. Math 108 had slightly higher success rates for STEM majors, but Psy 105 showed higher success and retention rates for SLAM majors. Math 151 – Precalculus had the highest success rates for STEM majors among all 100 series courses.

Table 3. Performance Measures by STEM vs SLAM Majors

Fall 2019	Succes	s Rates	Retention Rates		
Course	STEM-Majors	SLAM-Majors	STEM-Majors	SLAM-Majors	
095	53.6%	52.1%	87.8%	86.9%	
102	61.6%	50.2%	84.8%	84.2%	
103	58.5%	66.7%	86.2%	94.4%	
108	73.2%	69.1%	90.2%	91.1%	
115	n/a	68.2%	n/a	86.4%	
Psy-105	61.1%	70.8%	66.7%	90.8%	
151	74.6%	50.0%	95.2%	73.1%	

STEM = Bio, Astronomy, Chemistry, CS, Comp Eng., ElecTech., EnvSci, Nursing, Math, Geology, Geography, Pharm., Physics SLAM = All other AA, AS, AA-T, AS-T

Figures 1 and 2 break these courses down by course and emphasis: STEM (Science, Technology, Engineering, and Mathematics) vs SLAM (Statistics and Liberal Arts Math). Within the STEM track, the recommended entry-level transfer course, 102 – College Algebra shows an average 50.8% success rate over the past three fall terms. Within the 200 series courses, the highest success rate was in 252 - Multivariable Calculus (85.8%), which also had the highest retention rate (93%).

Within the SLAM track, the newly offered course, 141 – Business Calculus (fall 2019 only) had the highest success rate (81.8%) and Psy-105 – Statistics for the Behavioral Sciences followed with 65.9% success, 7.5% points higher than 108 - Introduction to Probability and Statistics. Psy 105 also had the highest retention rate in this track (95.9%).

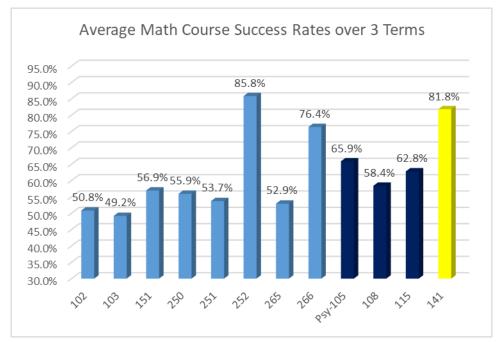


Figure 1. Fall 2017, 2018, 2019 Aggregated Course Success Averages Color Key: Light Blue = STEM-Track, Dark Blue = SLAM Track, Yellow = SLAM Track-Fall 2019 Only

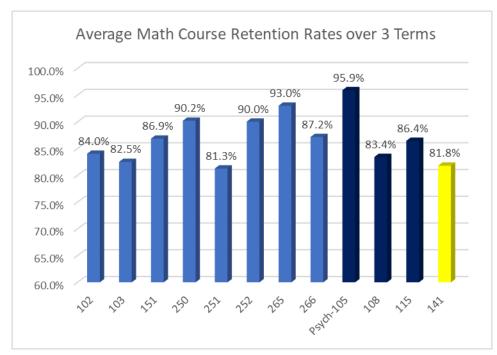


Figure 2. Fall 2017, 2018, 2019 Aggregated Course Retention Averages Color Key: Light Blue = STEM-Track, Dark Blue = SLAM Track, Yellow = SLAM Track-Fall 2019 Only

Table 4 disaggregates developmental math courses by race. Math 942 and 952 are no longer offered since the rollout of AB705. Historically, students performed better in 952 in comparison to 942, but the only current developmental course is 962 - Arithmetic and Prealgebra. Overall, there has been a large performance decline in this course between fall 2018 and 2019, with the Hispanic students showed the greatest decline. Black students showed the lowest variation in performance.

Table 4. Developmental Course Success and Retention by Race

	urse Succes		Race	Math Course Retention Rates by Race				v Race
Fall Terms	2017	2018	2019		Fall Terms	2017	2018	2019
Math Course	Success	Success	Success		Math Course			
942					942			
Asian	66.7%	87.5%	n/a		Asian	77.8%	100.0%	n/a
Black	57.8%	53.7%	n/a		Black	80.0%	90.7%	n/a
Hispanic	70.7%	61.0%	n/a		Hispanic	94.2%	92.9%	n/a
Nat.Amer/PI	n/a	n/a	n/a		Nat.Amer/PI	n/a	n/a	n/a
White	72.7%	65.2%	n/a		White	100.0%	95.7%	n/a
952					952			
Asian	88.9%	85.7%	n/a		Asian	88.9%	100.0%	n/a
Black	60.0%	68.8%	n/a		Black	94.3%	81.3%	n/a
Hispanic	71.6%	83.5%	n/a		Hispanic	94.3%	94.9%	n/a
Nat.Amer/PI	n/a	n/a	n/a		Nat.Amer/PI	n/a	n/a	n/a
White	95.2%	100.0%	n/a		White	100.0%	100.0%	n/a
962					962			
Asian	n/a	87.5%	n/a		Asian	n/a	100.0%	n/a
Black	61.1%	50.0%	40.9%		Black	94.4%	85.7%	81.8%
Hispanic	80.2%	66.4%	28.1%		Hispanic	94.1%	94.5%	72.9%
Nat.Amer/PI	n/a	n/a	n/a		Nat.Amer/PI	n/a	n/a	n/a
White	79.2%	88.9%	61.5%		White	95.8%	94.4%	76.9%

n/a = 5 or less students

Figure 3 shows a decline in performance measures for Math 962 between fall 2018 and 2019, particularly for Hispanic students.

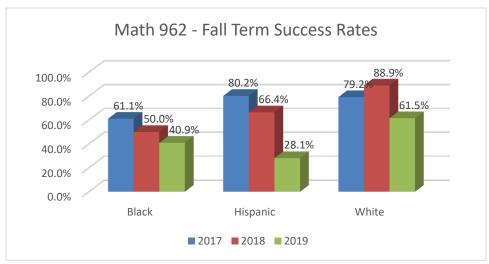


Figure 3. Fall 2017, 2018, 2019 Success rates for Math 962

Just above the developmental-level courses are the associate degree applicable, below transfer-level 095 – Intermediate Algebra and 096 – Elementary and Intermediate Algebra. Table 5 shows lower success rates for Blacks (50.3%), Hispanics (53.7%) and Native Americans and Pacific Islanders (46.1%) than Asians (67%) and Whites (66%) in 095 over a three-year average. The retention rates follow a similar trend.

Math 096 is a newer course that condenses elementary and intermediate algebra. The success rates for fall 2019 show lower success rates for Blacks (26.7%), Hispanics (36.0%), and Whites (37%) in comparison to Asians (48%) and Native American and Pacific Islanders (46%). The California state average success rate from <u>fall 2019 for degree applicable math courses with the 095/096 TOP Code, 170100, is 53%</u>. Comparing 095 and 096, all races except Native American and Pacific Islanders performed slightly better in Math 095.

Table 5. Performance Measures by Race in Intermediate Algebra - 095 and Elementary and Intermediate Algebra

Math	Course Su	iccess Rate	es by Race		Math Co	ourse Retent			
				3-					3-
Fall Terms	2017	2018	2019	Yr.Avg	Fall Terms	2017	2018	2019	Yr.Avg
					Math				
Math Course	Success	Success	Success		Course	Retention	Retention	Retention	
095					095				
Asian	73.5%	79.5%	47.6%	66.9%	Asian	97.0%	100.0%	83.3%	93.4%
Black	56.1%	57.8%	37.0%	50.3%	Black	77.2%	90.0%	82.1%	83.1%
Hispanic	60.4%	62.5%	38.1%	53.7%	Hispanic	89.3%	91.3%	81.1%	87.2%
Nat.Amer/PI	n/a	63.6%	28.6%	46.1%	Nat.Amer/PI	n/a	90.9%	78.6%	84.8%
White	71.7%	69.7%	55.6%	65.7%	White	91.3%	90.8%	81.8%	88.0%
096					096				
Asian	n/a	n/a	47.6%	n/a	Asian	n/a	n/a	85.7%	n/a
Black	n/a	n/a	26.7%	n/a	Black	n/a	n/a	78.3%	n/a
Hispanic	n/a	n/a	36.0%	n/a			n/a	80.1%	n/a
Nat.Amer/PI	n/a	n/a	45.5%	n/a	Nat.Amer/PI	n/a	n/a	81.8%	n/a
White	n/a	n/a	36.6%	n/a	White	n/a	n/a	78.9%	n/a

n/a = 5 or less students

Table 6 disaggregates STEM-track, entry level/transfer-level math courses by race. Success and retention rates have dropped from fall 2018 to 2019 for Math 102 – College Algebra. Performance measures for Math 103 – Trigonometry had mixed results; Asians and Whites did better in fall 2019 vs 2018, but Blacks and Hispanics show a performance decline. These courses are taken by both STEM and SLAM track students; the difference in performance in these courses between STEM vs SLAM majors was shown in Table 3.

Math 151 – Precalculus shows improved performance measures across all ethnicities between fall 2018 and 2019.

Table 6. STEM-track 100 Series Transfer-level Course Success and Retention by Race

Across all races, students performed best in Math 151- Precalculus in the most recent fall term.

	urse Succes			Math Course Retention Rates by Race				y Paco
		· ·						i
Fall Terms	2017	2018	2019		Fall Terms	2017	2018	2019
Math Course	Success	Success	Success		Math Course	Retention	Retention	Retention
102					102			
Asian	58.8%	80%*	59.2%		Asian	88.2%	100%*	81.6%
Black	53.1%	59.1%	29.8%		Black	90.6%	90.9%	79.8%
Hispanic	51.0%	60.8%	37.3%		Hispanic	83.8%	84.8%	82.1%
Nat.Amer/PI	n/a	n/a	33.3%*		Nat.Amer/PI	n/a	n/a	55.6%*
White	55.0%	80.8%	44.2%		White	80.0%	88.5%	78.8%
103					103			
Asian	77.8%*	62.5%*	66.7%		Asian	100%*	75.%*	86.4%
Black	60.0%	45.5%	30.8%		Black	90.0%	81.8%	84.6%
Hispanic	46.5%	50.6%	44.1%		Hispanic	83.1%	85.1%	79.5%
Nat.Amer/PI	n/a	n/a	n/a		Nat.Amer/PI	n/a	n/a	n/a
White	50%*	33%*	66.7%		White	90%*	33%*	87.5%
151					151			
Asian	100%*	90.9%	87.5%*		Asian	100%*	100.0%	100%*
Black	37.5%*	50%*	66.7%*		Black	87.5%*	50%*	100%*
Hispanic	60.8%	43.8%	55.0%		Hispanic	92.2%	82.8%	87.0%
Nat.Amer/PI	n/a	n/a	n/a		Nat.Amer/PI	n/a	n/a	n/a
White	n/a	57.1%*	66.7%		White	n/a	71.4%*	91.7%

^{*6 -10} students, n/a = 5 or less students

Table 7 disaggregates SLAM-track, entry level/transfer-level math courses by race. In Math 108 – Introduction to Probability and Statistics, Asian and White students show higher success and retention rates than the other races. Math 141 – Business Calculus had lower enrollment, so even comparisons based on race was not possible. Math 115 and Psy 105 showed similar trends: White students had higher performance measures than Black and Hispanic students. When looking at all races, students performed slightly better in Psy 105 than the other courses.

Table 7. SLAM-track 100 Series Transfer-level Course Success and Retention by Race

Math Cour	Math Course Success Rates by Race							
Fall Terms	2017	2018	2019					
Math Course	Success	Success	Success					
108								
Asian	100.0%	100.0%	73.1%					
Black	41.7%	37.5%	46.2%					
Hispanic	64.6%	55.3%	53.9%					
Nat.Amer/PI	n/a	n/a	66.7%					
White	50.0%	70.0%	75.4%					
115								
Asian	n/a	n/a	n/a					
Black	n/a	n/a	60.0%					
Hispanic	52.6%	72.0%	64.0%					
Nat.Amer/PI	n/a	n/a	n/a					
White	n/a	n/a	75%*					
141								
Asian	n/a	n/a	n/a					
Black	n/a	n/a	n/a					
Hispanic	n/a	n/a	100%*					
Nat.Amer/PI	n/a	n/a	n/a					
White	n/a	n/a	n/a					
Psy - 105								
Asian	n/a	n/a	n/a					
Black	n/a	n/a	59.1%					
Hispanic	54.5%	63.2%	66.7%					
Nat.Amer/PI	n/a	n/a	n/a					
White	n/a	n/a	83.3%					

Math Co	urse Retenti	on Rates by	Race
Fall Terms	2017	2018	2019
Math Course	Retention	Retention	Retention
108			
Asian	100.0%	100.0%	92.3%
Black	58.3%	75.0%	75.8%
Hispanic	85.4%	80.5%	87.6%
Nat.Amer/PI	n/a	n/a	77.8%
White	66.7%	90.0%	93.8%
115			
Asian	n/a	n/a	n/a
Black	n/a	n/a	100.0%
Hispanic	89.5%	84.0%	90.7%
Nat.Amer/PI	n/a	n/a	n/a
White	n/a	n/a	100%*
141			
Asian	n/a	n/a	n/a
Black	n/a	n/a	n/a
Hispanic	n/a	n/a	75%*
Nat.Amer/PI	n/a	n/a	n/a
White	n/a	n/a	n/a
Psy - 105			
Asian	n/a	n/a	n/a
Black	n/a	n/a	86.4%
Hispanic	100.0%	100.0%	90.3%
Nat.Amer/PI	n/a	n/a	n/a
White	n/a	n/a	100.0%

^{*6 -10} students, n/a = 5 or less students

Table 8 disaggregates STEM-track, 200-series transfer-level math courses by race. From fall 2018 to 2019, students performed better or as well in Math 250 – Single Variable Calculus I. Black and Hispanic student success rates fell below Asian and White students, but their retention rates exceeded Asian and White students. Most student group counts for Math 251 – Single Variable Calculus II were too low for a meaningful comparison, but Hispanic students with a course enrollment count >10 showed a decline of approximately 10% points in performance measures between fall 2018 and 2019. Only Hispanic students had a Math 252 – Multivariable Calculus enrollment count >10, and their performance measures increased by over 10% points between fall 2018 and 2019. The comparison data between fall 2018 and 2019 for Math 265 – Linear Algebra and Math 266 – Ordinary Differential Equations could not be determined due to low enrollment counts in fall 2018.

Table 8. STEM-track 200 Series Transfer-level Course Success and Retention by Race

	Math Course Success Rates by Race							
Fall Terms	2017	2018	2019					
Math Course	Success	Success	Success					
250								
Asian	n/a	62.5%*	68.8%					
Black	n/a	33.3%*	50.0%*					
Hispanic	50.0%	52.9%	52.6%					
Nat.Amer/PI	n/a	n/a	n/a					
White	n/a	66.7%	71.4%					
251								
Asian	n/a	90%*	70%*					
Black	n/a	n/	14.3%*					
Hispanic	50.0%	51.2%	42.0%					
Nat.Amer/PI	n/a	n/a	n/a					
White	50%*	80%*	87.5%*					
252	<u> </u>							
Asian	n/a	n/a	87.5%*					
Black	n/a	n/a	n/a					
Hispanic	n/a	72.7%	87.0%					
Nat.Amer/PI	n/a	n/a	n/a					
White	n/a	n/a	n/a					
265								
Asian	n/a	n/a	100.0%					
Black	n/a	n/a	n/a					
Hispanic	64.0%	30%*	64.0%					
Nat.Amer/PI	n/a	n/a	n/a					
White	n/a	n/a	n/a					
266								
Asian	n/a	n/a	92.9%					
Black	n/a	n/a	n/a					
Hispanic	100%*	50%*	87.0%					
Nat.Amer/PI	n/a	n/a	n/a					
White	n/a or less stude	n/a	n/a					

Math Co	urse Retenti	on Rates by	Race
Fall Terms	2017	2018	2019
Math Course	Retention	Retention	Retention
250			
Asian	n/a	100%*	87.5%
Black	n/a	100%*	100%*
Hispanic	87.5%	84.3%	91.8%
Nat.Amer/PI	n/a	n/a	n/a
White	n/a	88.9%	85.7%
251			
Asian	n/a	100%*	90%*
Black	n/a	n/a	71.4%*
Hispanic	84.0%	79.1%	68.0%
Nat.Amer/PI	n/a	n/a	n/a
White	100%*	100%*	100%*
252			
Asian	n/a	n/a	100%*
Black	n/a	n/a	n/a
Hispanic	n/a	81.8%	91.3%
Nat.Amer/PI	n/a	n/a	n/a
White	n/a	n/a	n/a
265			
Asian	n/a	n/a	100.0%
Black	n/a	n/a	n/a
Hispanic	88.0%	100%*	88.0%
Nat.Amer/PI	n/a	n/a	n/a
White	n/a	n/a	n/a
266			
Asian	n/a	n/a	100.0%
Black	n/a	n/a	n/a
Hispanic	100%*	66.7%*	95.7%
Nat.Amer/PI	n/a	n/a	n/a
White	n/a	n/a	n/a

^{*}6-10 students, n/a = 5 or less students

Table 9 shows all math course success and retention rates during fall 2019 by gender. The differences between females and males in the below transfer-level courses are unremarkable. Within the STEM-track 100 series transfer-level, a major increase in success rates in 102 – College Algebra can be seen for males (17.8% points). Males also had much higher success rates (45.4% points) than females in 265 – Linear Algebra. Within the SLAM-track, females outperformed males in both statistic courses: 108 (5.1% points), Psy 105 (18.7% points). Males had better success and retention rates in 115 – Ideas of Math (10.2% and 23.1% points, respectively).

Table 9. All Math Course Success and Retention Rates by Gender

Course Success by Gender - Fall 2019			Course Retention by Gender - Fall 2019		
Course	Female	Male	Course	Female	Male
962	49.1%	50.0%	962	79.2%	90.9%
095	50.3%	55.6%	095	84.8%	90.6%
096	45.2%	42.5%	096	85.7%	86.3%
102	45.3%	63.1%	102	81.4%	87.9%
103	60.0%	55.6%	103	86.0%	88.9%
151	65.2%	68.9%	151	87.0%	91.1%
250	58.8%	55.4%	250	94.1%	90.8%
251	44.0%	46.9%	251	76.0%	71.9%
252	90.9%	88.9%	252	100.0%	94.4%
265	45.5%	90.9%	265	81.8%	95.5%
266	85.7%*	92.3%	266	100%*	96.2%
108	71.5%	66.4%	108	90.1%	93.6%
115	66.7%	76.9%	115	81.8%	100.0%
141	n/a	n/a	141	n/a	n/a
Psy - 105	75.0%	56.3%	Psy - 105	89.3%	87.5%

^{*6 -10} students, n/a = 5 or less students

Color Key: Light Blue = Below transfer-level, Light Green = 100 series transfer-level, Dark Green = 200 series STEM-track transfer-level, Orange = SLAM-track transfer-level

Summary:

There is a notable difference in performance measures within the STEM vs SLAM tracks as well as the different racial and gender groups within the students enrolled in them. A math track in alignment with student goals/majors should help to increase performance measures. Other alternative mathematical models also adds a business track.³

References:

- 1. https://pasadena.edu/academics/divisions/math-computer-science/math/slam-sequence.php, https://www.cmc3s.org/conferences/Spring2014/presentations/LindaHintzmanSLAM.pptx
- 2. https://pasadena.edu/academics/divisions/math-computer-science/math/math-sequences.php
- 3. https://www.dvc.edu/enrollment/assessment/assessments/math-placement-options.html#STEM