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Assessment Levels for Students in Entry-level Transfer Math Fall 2020 Research Brief #213

College of the Canyons

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Introduction & Background

In response to mathematics faculty inquiry into best practices for determining type and extent of support needed among enrolled students in entry-level transfer Math courses, the office of Institutional Research, Planning and Institutional Effectiveness conducted analyses examining the distribution of assessment levels disaggregated by course.

In light of AB705 (effective fall 2019), the Math department increased access to transfer-level courses for all students (see Numbered Report 329 and Research Brief 202 for details on implementation and outcomes).

The following research question guided these analyses:

- What are the proportions of the various assessment levels represented in each entry-level transfer–math course (i.e. MATH-100, MATH-140/090, MATH-102/092, MATH-103/093)?

Method

The 320 Enrollment report for fall 2020 (as of the end of week 1 of the semester) was used to identify students enrolled in the specified entry-level transfer math courses. Assessment data were obtained through the Placement Scores Informer report for the years 2019 and 2020 (January 1st through August 31st) for the two years that the new AB705 Assessment has been in place. Where assessment data were missing for 2020, and the student was assessed in the previous year, the 2019 data were used.[1] Some students were enrolled in multiple courses, and were included in the counts of each course they were enrolled in.

Results

Assessment Levels

The various assessment levels for Math are distinguished based on a student's self-reported history of highest Math course completed, grade in the course and overall high school GPA. Table 1 presents the criteria (rules), course eligibility and percentages of students assessing into each level in the first year of AB705 implementation (2019). The most common assessment level is level 2, where students self-report completing Algebra 2 or higher and a GPA < 3.0, *or* completing Algebra 1 or higher and a GPA >3.0.

Table 1. Criteria, Course Eligibility and Percentages of students for each Assessment Level

	Criteria	Course Eligibility	Percentages Assessing in each Level 2019 (N=6,217)
Level 1 (Default)	Default, missing High School information on last course and/or GPA	MATH-102/92, MATH- 103/93, MATH-140/090	7.7%
Level 1	Completed course below Algebra 2 and GPA < 3.0 *or* Completed course below Algebra 1 and GPA >3.0	MATH-102/92, MATH- 103/93, MATH-140/090	14.2%
Level 2	Completed Algebra 2 or higher and GPA < 3.0 *or* Completed Algebra 1 or higher and GPA >3.0	MATH-102/92, MATH- 103/93, MATH-140	43.4%

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[1] Per the request, all students with an assessment level were included regardless of whether they were first-time students in fall 2020, or if they had previously enrolled in Math courses between their assessment date and the fall 2020 term.

	Criteria	Course Eligibility	Percentages Assessing in each Level 2019 (N=6,217)
Level 3	Completed Calculus and GPA < 3.0, *or* Completed Trig. with A or a higher course and GPA > 3.0 *or* Completed Algebra 2 or higher and GPA >3.5	MATH-102, MATH-103, MATH-140, MATH-111	16.8%
Level 4	Completed Trig. with A or a higher course and GPA > 3.5	MATH-102, MATH-103, MATH-104, MATH-140, MATH-111	13.7%
Level 5	Completed Calculus with A/B and GPA >3.5	MATH-102, MATH-103, MATH-104, MATH-140, MATH-111, MATH-240, MATH-211	4.1%

Entry-level Statistics/Liberal Arts Pathway Courses

For the new Liberal arts Math course (MATH 100), most students enrolled have assessed into either Level 1(18%) or level 2 (39%). For the Introduction to Statistics with-support course (MATH-140/090), close to a third of the students assessed into Level1 (31%) and about a quarter of the students assessed into Level 2 (22%). The next largest group, approximately a quarter, were those for whom assessment data was unavailable during the AB705 implementation years (2019/2020) implying that these, not-newly assessed students were coming through the sequence, and assessed in prior years, or were given eligibility through transcripts.

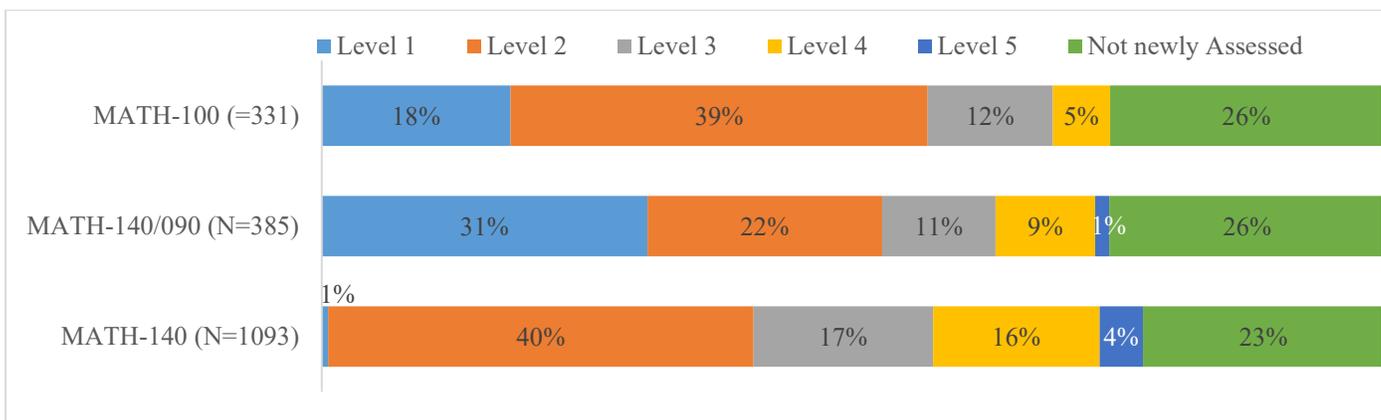*Figure 1. Statistics/Liberal Arts courses: Percentage of students in each Assessment Level*

Table 2. Statistics/Liberal Arts courses: Counts in each Assessment level

	Level 1	Level 2	Level 3	Level 4	Level 5	Not newly Assessed	Total Enrolled
Liberal Arts Math, MATH-100	59	130	39	18	0	85	331
Introduction to Statistics w/ support, MATH-140/090	118	85	41	36	5	100	385
Introduction to Statistics, MATH-140	7	438	184	171	45	248	1093

Entry-level B-STEM Pathway

For BSTEM/Calculus pathway Math courses with-support, the most common assessment category was level 2 (67% in Trigonometry, MATH-102/092; 39% in College Algebra, MATH-103/093). The 'not newly assessed' proportions varied across Trigonometry with-support and College Algebra with-support. Only 11% were 'not newly assessed' in MATH-102/092 and 32% were 'not newly assessed' in MATH-103/093 implying that MATH-103/093 students were more likely to come through the sequence, were assessed in prior years, or were given eligibility through transcripts than the MATH-102/092 enrolled students. The non-support courses were largely comprised of students assessing into level 3.

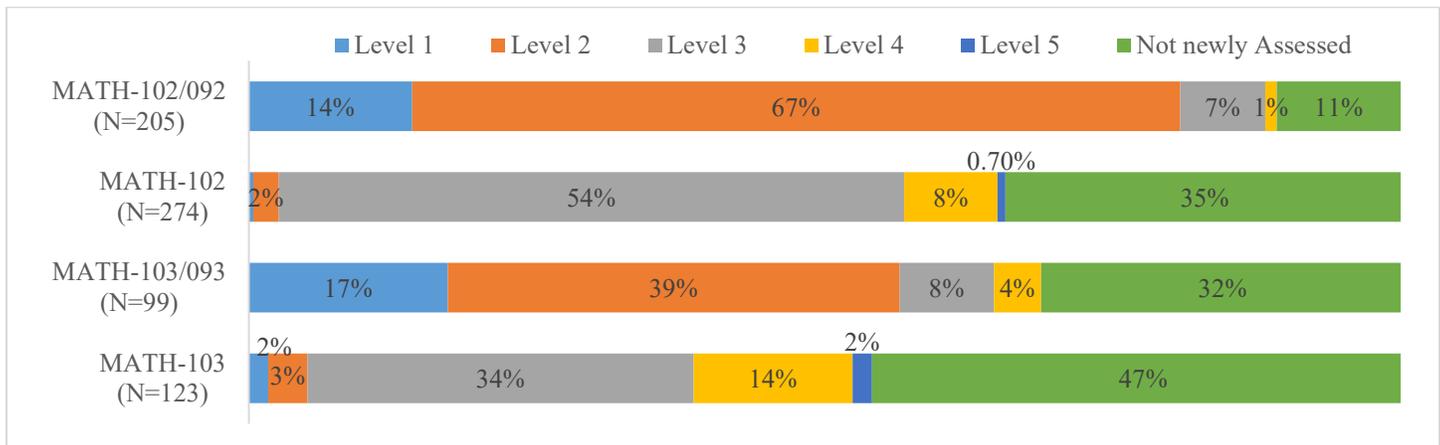*Figure 2. B-STEM course: Percentage of students in each Assessment Level*

Table 3. BSTEM course: Counts in each Assessment level

	Level 1	Level 2	Level 3	Level 4	Level 5	Not newly Assessed	Total Enrolled
Trigonometry w/ support MATH-102/092	29	137	15	2	0	**22**	205
Trigonometry, MATH-102	1	6	149	22	2	**95**	274
College Algebra, MATH-103	2	4	40	17	2	**58**	123
College Algebra w/ support MATH-103/093	17	39	8	4	0	**31**	99
College Algebra, MATH-103	2	4	40	17	2	**58**	123

Summary of Findings

- Majority of students who enrolled in Liberal Arts math or Statistics with support assessed into Level 1 *or* Level 2 (52-60%) implying either they did not complete Algebra 2 or had a less than 3.0 GPA.

- For students enrolling in entry-level BSTEM "with-support" courses, Level was the most common assessment category.

Using the new placement level 1 as a proxy for students needing a lot of extra support may not lead to the intended 'understanding' or utility for designing the course requirements/assignments. First, the current "placement level" is not a skills assessment so it may not yield information on a students' understanding or memory of certain level of knowledge

and does not capture the amount of time it has been since the student's last experience with a Math course. Second, Level 2 students are likely to benefit from the same "support activities" as Level 1 students (for example, % increase; refresher on slope of the line, including interpretation of slope of the line and y-intercept in context).

Recommendations

Upon review of the results on the impact of AB705 on Math and English, the following recommendations should be taken into consideration:

- For all "with-support" classes, consider just-in-time remediation activities as a substantial proportion of these students assessed at Level 1 /Level 2.

- To gauge more skill-based support needs, consider further in-class assessments (e.g. pre-tests).

For questions, or more information on this research brief, contact Preeta Saxena, Ph.D., Senior Research Analyst or Daylene Meuschke, Ed.D., Associate Vice President Institutional Research, Planning and Institutional Effectiveness