Remediation in Maryland Higher Education

Part 5:
First-Year Outcomes

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PART 5: FIRST-YEAR ACADEMIC OUTCOMES

There are longstanding concerns regarding whether remedial coursework[1] at the college or university level is the most effective and efficient way to increase student success for students deemed not "college ready" upon entry to college. Requiring students to complete these courses (often non-credit-bearing) prior to becoming eligible for college-level, credit-bearing courses may hinder their progress toward a degree or other credential. This may serve as an impediment to success and completion. However, concern regarding these impacts may prove particularly important if there are flaws in either the process for identifying those students who need additional support or in the way those courses are structured.

While much attention and debate focuses on how remediation represents some sort of "failure" – by either the student or the educational system – research has shown that the additional supports provided to students through remedial courses prepare them for success in credit-bearing coursework.[2] This is part of the driver behind the ongoing redesign of remedial courses leading towards different course structures, such as co-requisite remediation models.

Parts 1 through 4 of our research series on remediation at Maryland colleges and universities have evaluated a number of issues. Beginning with a first-time, full-time cohort entering in Fall 2017, this research has explored the rates of assessment (Part 2), completion (Part 3), and credit-bearing "gateway" course completion within the first year of enrollment (Part 4). This report, Part 5 of the series, presents students' first-year academic outcomes by examining their grade point average (GPA) and credits accumulated by the end of the first year.

Key Findings

- Students who entered their institution as "college ready" were much more likely to meet a 24- or 30-credit threshold by the end of their first year than students requiring remedial courses in colleges and universities (regardless of whether or not the student actually completed the remedial coursework).
- Among students who were assessed to need remediation at entry into postsecondary education, those who completed the remedial course or courses were more likely to meet a 24-credit threshold than those who did not complete

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[1] In this series, remedial education and developmental education are used interchangeably. More details on this can be found in earlier reports in the series, found here:
https://mhec.maryland.gov/publications/Pages/research/index.aspx under Policy Studies and Information Reports.
[2] The impact of remediation on success, however, has been shown to vary in accordance with many factors, including race, socioeconomic status, and prior academic preparation. For example, see Bettinger, Boatman, and Long's 2013 analysis regarding the nuances of remedial course impacts upon various populations.

assigned remedial courses; at the 30-credit threshold this difference fades, with both remedial groups meeting that goal at similar rates.

- Students who completed remedial courses as assigned (therefore making them "college ready" upon completion) were nearly as likely as students who initially enrolled "college ready" to meet a 2.0 GPA threshold in their first year, while among students who did not complete required remedial courses, the percentage meeting the 2.0 GPA threshold was much lower than either group.
- These overall patterns held true at both community colleges and four-year public colleges and universities although the magnitude of differences vary.

Introduction

The core purpose of this report series is to examine the relationship between developmental education at the postsecondary level and student success. There are ongoing concerns about the numerous ways in which assignment to "need remediation" (i.e., to be assessed as "not college ready") may prove detrimental to student progression and completion. In particular, requiring students to complete remedial coursework prior to being eligible for college-level courses may unnecessarily extend their time to graduation.

Prior reports in this series have examined the extent to which these concerns seem to be borne out in students' course-taking and course completion behavior. Part 3 of the series examined remedial course completion among first-time, full-time students assessed to need remediation and found that some students assigned to remediation never completed the remedial coursework. Part 4 then examined these same students' success in "gateway" courses (i.e., credit-bearing, non-remedial courses) in English and math and found that completion of these courses was low across all remedial groups, although particularly low among students who required remedial courses. This analysis, part 5 of the series, builds upon this prior work to further examine the success of the entering cohort by developmental status within the first year of enrollment, as measured by first-year GPA and credit accumulation.

First-Year Academic Outcome Measures

This analysis focuses on two first-year academic performance outcomes: (1) credit accumulation and (2) end-of-year GPA. There are a number of factors that point to these metrics as critical to student success and completion.

Credit accumulation has long been identified as an important factor in student progression. The "traditional" time to graduation – typically two years for an associate degree and four years for a bachelor's degree – assumes that students will complete at

least 15 credits each fall and spring if they are to graduate on time. [3,4] Not completing 30 credits within the first year immediately places the student in a position where they need to play catch-up to complete within the traditional time-to-graduation metric. A common criticism of remediation is that it delays student entry into college-level, credit-bearing coursework, thereby curtailing the accumulation of 30 credits per year.

There is substantial research pointing to the importance of first-year GPA as a predictor of long-term success. [5] GPA can serve as a proxy measure for student engagement with their coursework and their adjustment to the college experience. Similarly, the first-year GPA also serves as a baseline for a student's future academic career.

Academic progression is not the sole source of the importance of first-year GPA and credit accumulation. Many financial aid programs, both state and federal, require a minimum GPA of 2.0 to maintain eligibility. In particular, two of Maryland's largest financial aid programs, the Educational Access and Guaranteed Access Grant programs, require students to complete 30 credits annually to maintain eligibility for the full award. [6]

METHODS

Metrics

Performing this analysis begins with the baseline first-time, full-time cohort established in Part 2 of the series, and expanded upon with data used in Parts 3 and 4. [7] The dataset built for Part 2 incorporated student demographic information and information on whether a student was assessed to need remediation in a given subject during the Fall 2017 semester. [8] The dataset was expanded in Parts 3 and 4 to incorporate which courses a student enrolled in, whether a course was identified as remedial in a given subject, and whether a course was considered entry-level in a given subject. A student was then identified as completing a remedial or entry-level credit-bearing course in a specific

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[3] The National Center for Education Statistics defines "normal completion time" as 4 years for bachelor's degree programs and 2 years for associate programs. https://surveys.nces.ed.gov/ipeds/public/glossary. Despite this definition, the majority of students do not complete within these timeframes, meaning that completion within these timeframes is actually outside of the norm. For example, according to National Student Clearinghouse data, among students receiving associate and bachelor's degrees in 2014-2015, the average time to degree was 5.5 years for students receiving associate degrees and 5.7 years for those receiving bachelor's degrees. https://nscresearchcenter.org/wp-content/uploads/SignatureReport11.pdf.

[4] In accordance with Maryland Education Article 15.116, associate and bachelor's degree program requirements, with minimal exceptions, cannot exceed 60 credits and 120 credits, respectively.

[5] As noted by Clifford Adelman in *The Toolbox Revisited*: "If one's first-year GPA falls in the top two quintiles, the probability of earning a degree increases by nearly 22 percent", *Crossing the Finish Line* p. 54

[6] Beginning in their third year of college, students are eligible to renew the award at a prorated rate if they have completed between 24 and 29 credits in the prior academic year, and renders students ineligible if they fall below that threshold.

[7] For additional information regarding the methodology and data limitations for Parts 2 through 4 of the series, please see the appendix.

[8] Analyses throughout this brief are based solely upon assessment during the initial term of enrollment.

subject within a given term, and at any time within their first year at the institution. These analyses divided students into three groups based upon their developmental status:

1) **Remediation Not Needed (RNN)** – this developmental category includes students who were identified as not needing remedial coursework in the given subject (math or English) during the term of entry to the institution or who had no assessment status. These students could be considered "college ready."

2) **Completed Remedial Course (CRC**) – this developmental category includes students who were identified as needing remedial assistance in the given subject at the term of entry and successfully completed at least one developmental course in this subject in the first year, as well as students who were not identified as needing remediation but completed a remedial course in the subject (math or English).[i,ii]

3) **Remediation Required – Not Completed (RRNC)** – this developmental category includes students who were assessed to need remediation and failed to successfully complete a remedial course in the given subject. This includes both students who did not attempt the remedial course and students who enrolled in the course but did not successfully complete it (got a failing grade or withdrew).

In assessing which category a student should be placed, this work relies on a student's placement and completion across both math *and* English. This means that a student assessed to need both math and English developmental coursework would be classified as having completed that coursework only if they completed required courses in both subjects. Conversely, if a student only needed remediation in math but not English, they were placed in the appropriate "completion" category depending on whether they fulfilled the remedial course requirement or not.

For purposes of this analysis, the dataset was further expanded to include information on student end-of-term outcomes. A student's final record in the 2017-2018 academic year, consisting of fall 2017 through summer 2018, was identified and matched with the file containing the data used in prior reports in this series.[9] Two variables of particular interest, cumulative credit hours awarded and cumulative GPA, were used in this analysis. A small number of students who were missing both GPA and credit information were excluded from the analysis.[10]

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[9] In an effort to most completely capture first-year outcomes, the data contained in this report includes the student record from ANY institution, not solely the original institution a student attended. Analysis of student outcomes across transfer and non-transfer students shows minimal differences between the transfer and non-transfer student populations with the exception of credit accumulation among students transferring from four-year public institutions (this difference exists whether a student transferred to a community college or to another four-year institution). It is not clear from the data what might drive this; while this may be due to incomplete or missing data, there is no similar effect among students transferring from community colleges.

[10] This included 177 students at community colleges and eight at public four-year institutions.

In accordance with the goals of this report – determining what percentage of students among each developmental status were academically successful in the first year – this analysis establishes credit and GPA thresholds. A GPA of 2.0 is considered the general standard for students to be in good academic standing, so this report uses that as the threshold for GPA. For credits, this report establishes both a 24-credit threshold – which is considered to be satisfactory progress for purposes of federal financial aid – and 30 credits – which meets the goal of best keeping students on track for on-time graduation.

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DATA ANALYSIS

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Community Colleges

First-Year Credit Accumulation

Over one-third of all full-time students entering Maryland community colleges in the fall of 2017 completed at least 24 credits within the first academic year, and approximately one-quarter of students completed at least 30.[11] However, as demonstrated in Table 1, this differed substantially by developmental status. Students prepared to enter directly into credit-bearing coursework (RNN) were more than twice as likely to complete 24 credits or more than all students requiring remedial coursework, and nearly four times as likely to complete 30 credits or more.[12] There are also substantial differences in credit accumulation across students requiring remediation with nearly one-third of students who completed the required remedial coursework (CRC) earning 24 or more credits, while less than one-quarter of those who failed to complete assigned developmental courses (RRNC) reaching that threshold. The percentage of students reaching the 30-credit threshold, however, is much more comparable.

Table 1: First-Year Credit Accumulation, Students Entering Maryland Community Colleges in Fall 2017			
Developmental Status	**Cohort size**	**Completed 24+ Credits**	**Completed 30+ Credits**
Remediation Not Needed (RNN)	4,812	60.5%	39.2%
Completed Remedial Course (CRC)	3,603	29.1%	12.2%
Remediation Required – Not Completed (RRNC)	3,656	19.8%	9.7%
All Students	12,071	38.8%	22.2%

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[11] This includes all credits a student had been awarded by the end of the first year, not solely those credits native to the institution. This analysis does not differentiate between credits earned at the institution (native credits) and those that may have been earned via another mechanism, such as AP or IB examinations or credits awarded as part of early college participation. This is the likely driver of students having accumulated over 30 credits.

[12] See the methods section of this report for further discussion of these remedial categories used throughout this analysis.

These findings are somewhat puzzling on the surface because, from a term and year credit load perspective, college-ready students and students who needed remediation and did not take the necessary courses should look similar; both are not hindered by non-credit bearing remedial courses in their semester schedules. Yet the data reflect their first-year credit accumulation is very different. If students who fail to complete required remedial courses and thus have extra space in their schedule to take credit-bearing courses are earning fewer credits than those students who *do* take the remedial courses, it might be evidence of the fact that completing remedial coursework is not the main impediment to student progression. However, there may be other factors contributing to this finding.

First, students who did not complete required remedial coursework (RRNC) were more likely than those students who did (CRC) to have only enrolled in the fall term, indicating that they only completed one term – among these RRNC students, one-quarter had a final term of fall (Table 2). Given that enrolling in only one term rather than two or more provides students much less opportunity to earn credits, the percentage of students likely to meet the threshold would be expected to be substantially lower. This is likely one driver of lower credit accumulation among those students who required remediation and did not complete it.

Table 2: Last Term of Enrollment, Students Entering Maryland Community Colleges in Fall 2017			
	Fall	**Spring**	**Summer**
Remediation Not Needed (RNN)	11.5%	61.3%	27.1%
Completed Remedial Course (CRC)	6.7%	65.5%	27.7%
Remediation Required – Not Completed (RRNC)	25.2%	57.4%	17.2%

Additionally, the lower percentage of students who completed required remedial courses (CRC) and who completed 30 credits or more (as shown in Table 1) may suggest that there *is* a displacement effect occurring: that completing remedial courses is preventing students from making the progress needed to complete on-time. However, the difference between students who completed remedial courses (CRC) and those who required them but failed to complete them (RRNC) in regards to last term of enrollment remains minimal (see Table 3, p. 7).

If a displacement effect was driving lower levels of credit accumulation, then it might be expected that students enrolling in the summer term as a way of "catching up" might have levels of credit attainment similar to those students who entered as college ready. In other words, while it would be reasonable to assume that students who need remedial courses and took them in the first year would "catch up" to those who were considered college ready, but this does not appear to be the case. Instead, these students are comparable to their peers who needed remediation but did not take the requisite courses (presumably taking credit-bearing instead). This may mean there are other barriers to credit completion not visible through these data (e.g., higher rates of students enrolling in but not completing courses every term, students reducing

their credits in the spring term to part-time status to accommodate a job or other pressures, or shifts in financial aid that reduce the number of courses a student can afford).

Developmental Status	Fall		Spring		Summer	
	Completed 24+ Credits	Completed 30+ Credits	Completed 24+ Credits	Completed 30+ Credits	Completed 24+ Credits	Completed 30+ Credits
Remediation Not Needed (RNN)	24.4%	19.9%	61.5%	34.2%	79.6%	64.6%
Completed Remedial Course (CRC)	0.8%	0.0%	20.8%	4.7%	55.4%	32.5%
Remediation Required – Not Completed (RRNC)	3.3%	2.8%	19.0%	7.0%	49.3%	31.3%

Table 3: First-Year Credit Completion by Last Term of Enrollment, Students Entering Maryland Community Colleges in Fall 2017[13]

First-Year GPA

When examining first-year cumulative GPAs[14] of the community college students, the comparisons across developmental completion groups show patterns rather dissimilar to those seen in the credit threshold analysis. Across the entire entering student body, approximately two-thirds of students had a cumulative GPA of 2.0 or higher at the end of the first year. However, what is particularly striking in these data are the fact that the rates of students meeting the 2.0 threshold who required remediation and completed it (CRC) are nearly *identical* to students who entered as college-ready (RNN). Fewer than half of students who did not complete required remedial courses (RRNC) met the 2.0 threshold.

Table 4: First-Year GPA, Students Entering Maryland Community Colleges in Fall 2017		
Developmental Status	**Cohort size**	**GPA 2.0 or higher**
Remediation Not Needed (RNN)	4,812	77.3%
Completed Remedial Course (CRC)	3,603	74.9%
Remediation Required – Not Completed (RRNC)	3,656	48.2%
All Students	12,071	67.8%

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[13] A very small number of students (n =15) had a final enrollment record in the winter term. While excluded from this table, they are included in the overall analysis.

[14] GPA data represent the GPA as of a student's final completed term (a "cumulative" GPA) in the first year; e.g., for students whose final term was Fall 2017, GPA data are based on the reported GPA at the end of the fall semester, while for students who completed the Summer 2018 their GPA would represent their cumulative GPA as of the end of the summer term.

Interaction between developmental status, GPA, and credit accumulation

These data show that students who required remediation but did not complete the courses (RRNC) were less likely to return to college after the fall term as compared to the students who did complete their remedial courses (CRC). The over-representation of RRNC students within those non-returning students might indicate that particularly poor first-term academic performance among this group of students in the first term might contribute to the failure to return in subsequent semesters.[15] This speculation is further supported by the fact that less than one-quarter of the RRNC students who did not return for a subsequent semester met the 2.0 threshold, while nearly half of students who continued into the spring term ended the year with a least a 2.0 GPA. This may be evidence that these students are particularly likely to be attempting courses for which they are not prepared and failing them, and subsequently, deciding not to return. Alternatively, it is also possibly evidence of the fact that remediation works, and that it is adequately preparing students for success at a degree nearly level to that of their peers who entered as college-ready (RNN).

Four-Year Public Colleges and Universities

First-Year Credit Accumulation

Overall, most students at public four-year colleges and universities met or exceeded the 24-credit threshold within the first year. [16] More than three-quarters of students completed at least 24 credits, while over three-fifths completed at least 30 (Table 5, p. 9). Students who completed necessary remedial coursework were much less likely than students who did not need any developmental courses (RNN) to complete 24 credits, but more likely to do so than students who failed to complete necessary remedial courses (RRNC). There is, however, almost no difference between students who completed required remediation and those who did not in terms of how likely they were to complete at least 30 credits.

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[15] Data show this is true across all developmental categories; nearly 70% of students whose last term was the fall failed to meet the 2.0 GPA threshold. However, the greater concentration of RRNC students among those failing to return for a subsequent semester may have a greater impact upon the rate of students meeting the 2.0 threshold.

[16] As noted in discussion of the community colleges, and particularly relevant to the four-year institutions, this includes all credits a student had been awarded by the end of the first year, not solely those credits native to the institution. This analysis does not differentiate between credits earned at the institution (native credits) and those that may have been earned via another mechanism, such as AP or IB examinations or credits awarded as part of early college participation. This is the likely driver of students having accumulated over 30 credits.

Table 5: First-Year Credit Completion, Students Entering Maryland Four-Year Public Colleges and Universities in Fall 2017			
Developmental Status	**Cohort size**	**Completed 24+ Credits**	**Completed 30+ Credits**
Remediation Not Needed (RNN)	11,790	82.6%	68.6%
Completed Remedial Course (CRC)	1,454	58.7%	24.6%
Remediation Required – Not Completed (RRNC)	975	44.0%	23.0%
All Students	14,219	77.5%	61.0%

Among students at Maryland's four-year public colleges and universities, enrollment patterns do not seem to be a primary driver of differences in credit completion across groups. Students in all three groups are approximately equally likely to have fall as a first term of enrollment (Table 6). Of perhaps more importance is the fact that students who did not need remediation (RNN) and those who needed it but failed to complete it (RRNC) enrolled in summer courses at approximately the same rates, both of which are slightly higher than students who completed required remedial courses (CRC). The fact that students who completed remedial courses did not meet the credit thresholds established above (Table 5) would not be surprising if this was the result of a displacement effect and the remedial courses took the place of credit-bearing coursework. However, this same effect would not be expected among those students who did not complete required remedial courses. On the contrary, these enrollment patterns suggest that students who did not complete required remedial courses were less successful in the courses they did enroll in, and used the summer term to attempt to make up for the ways in which they had fallen behind.

Table 6: Last Term of Enrollment, Students Entering Maryland Four-Year Colleges and Universities in Fall 2017[17]			
	Fall	**Spring**	**Summer**
Remediation Not Needed (RNN)	3.4%	77.0%	19.6%
Completed Remedial Course (CRC)	3.4%	82.9%	13.6%
Remediation Required – Not Completed (RRNC)	3.9%	77.7%	18.3%

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[17] A very small number of students (n =less than 10) had a final enrollment record in the winter term. While excluded from this table, they are included in the overall analysis.

However, the data show that enrollment patterns may not be the main driver of differences in credit accumulation across remedial categories. The likelihood of meeting the 24- or 30-credit-hour thresholds by last term of enrollment varies substantially both across and within remedial groups. For example, students identified as not needing remediation (RNN) who enrolled in the summer term were actually *less* likely to meet either the 24- or 30-credit-hour thresholds than those whose final term was spring (Table 7). On the other hand, students needing remedial courses– whether or not they completed them – who enrolled in the summer term were much more likely to meet the 30-credit-hour threshold than those whose last term of enrollment was the spring term. Among students who required remedial courses in particular, this may indicate that students are using the summer term to catch up. Again, as noted with the community college analysis, this is likely indicative of two differing drivers of summer-term enrollment among these two groups: students who completed remedial courses (CRC) may be using the summer term to "catch up" on courses that were displaced by non-credit-bearing courses, while students who failed to complete required remedial courses (RRNC) may be enrolling in summer courses after proving less successful in courses during the prior terms.

Table 7: First-Year Credit Completion by Last Term of Enrollment, Students Entering Maryland Four-Year Colleges and Universities in Fall 2017						
Developmental Status	**Fall**		**Spring**		**Summer**	
	Completed 24+ Credits	**Completed 30+ Credits**	**Completed 24+ Credits**	**Completed 30+ Credits**	**Completed 24+ Credits**	**Completed 30+ Credits**
Remediation Not Needed (RNN)	26.4%	19.9%	90.3%	74.4%	62.2%	54.3%
Completed Remedial Course (CRC)	2.0%	0.0%	61.0%	23.2%	58.6%	39.4%
Remediation Required – Not Completed (RRNC)	2.8%	2.8%	47.8%	23.4%	58.4%	40.6%

First-Year GPA

The majority of all students in the cohort of students enrolled at the public four-year institutions – nearly nine out of ten – earned a 2.0 GPA or higher within their first year of enrollment (Table 8). However, again there are substantial differences across remedial status groups. College-ready students (RNN) and students who completed the required remedial coursework (CRC) were comparably likely to achieve at least a 2.0 cumulative GPA. Students who required remediation and did not take those courses (RRNC), however, were much less likely than their peers to meet this important threshold.

Table 8: First-Year GPA, Students Entering Maryland Four-Year Public Colleges and Universities in Fall 2017		
Developmental Status	**Cohort size**	**GPA 2.0 or higher**
Remediation Not Needed (RNN)	11,790	91.5%
Completed Remedial Course (CRC)	1,454	82.1%
Remediation Required – Not Completed (RRNC)	975	61.1%
All Students	14,219	88.4%

Similar to differences in credit attainment for students at the public four-year institutions, there are likely drivers of this difference in GPA not immediately visible from the data. Again, the final term of enrollment may impact the differences across these groups. Students whose final term of enrollment was the fall term were overall much less likely to meet the threshold than those whose final term was spring or summer. This may indicate that across all groups, students failed to return for a second term due to a lack of success in the fall semester. However, students who did not complete required remedial courses (RRNC) who completed the spring and/or summer terms were still far less likely than RNN and CRC students to meet the GPA threshold, indicating that, despite their persistence, they may have been enrolling in courses for which they were ill-prepared.

Community College versus Public Four-Year College and University Outcomes

As shown above, there are both similarities and differences in first-year outcomes among students at community colleges and those at four-year public colleges and universities.

Overall, students at four-year public institutions were twice as likely to complete 24 credits as students at community colleges, and nearly three times as likely to complete 30. However, the differences across developmental status categories is strikingly similar to that of students at community colleges. At both community colleges and public four-year institutions, students who completed the necessary remedial coursework were much less likely than students who did not need any developmental courses to complete 24 credits, but more likely to do so than students who failed to complete necessary remedial courses. Also, at both types of institutions, among those who required remediation, there is almost

no difference between students who completed it and those who did not in terms of how likely they were to complete at least 30 credits.

Students at four-year public colleges and universities were overall more likely than students at community colleges to earn a GPA of 2.0 or higher, with nine out of ten students doing so compared to three-quarters of students at community colleges. This pattern is true across all remedial status groups. However, the gap between the percentage of students earning a 2.0 or higher among students who did not need remedial courses and those who completed those courses is higher at public four-year institutions than among students at community colleges.

RECOMMENDATIONS FOR POLICY AND PRACTICE

- These data show that meeting the credit and grade point average thresholds to make satisfactory academic progress and meet state and federal aid program requirements are difficult for many first-time, full-time undergraduate students.. Institutions should consider whether promotion of the summer term may provide a useful tool to enable students to meet these thresholds.
- Federal, state and institutional financial aid programs should similarly consider incentivizing and supporting enrollment during the summer term so that students have the necessary financial assistance to enroll during that time. The use of programs such as summer Pell should be encouraged as a way to keep students on track to timely completion.
- At the state level, there should be renewed examination of whether thresholds – particularly credit accumulation thresholds – established to maintain eligibility for some financial aid programs prove the most effective mechanism to encourage momentum. This analysis suggests that credit accumulation thresholds may in fact prove to be disincentives to student success, and encourage students to enroll in courses in which they might not be successful in the hope of meeting established credit accumulation thresholds.

CONCLUSION

Prior briefs in this series have shown that there are large differences across remedial groups in course enrollment and completion behavior for both remedial and credit-bearing courses. This brief has also shown that these differences are evident in first-year academic performance as measured by first-year credit accumulation and first-year GPA.

Upcoming work in this series will examine student success and persistence patterns across these groups, with a particular focus on retention and completion.

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APPENDIX: DATA LIMITATIONS

There are a number of limitations inherent to using these data for analysis. As discussed previously, these analyses rely on several different data sets. Identifying students' enrollment in and completion of remedial and associated credit-bearing coursework, as well as the demographics of the student population, required a match across course information data, student registration data, and enrollment and demographic data.[iii] In the course of developing the datasets for prior analyses, any records missing student registration information, course information, or enrollment demographic information were removed from the analysis.[iv]

As was also discussed in prior reports, student records provided by the institution indicate whether a student has been assessed to need remediation in a given subject. However, these records do not provide more detailed information regarding the extent to which a student is assessed to need remediation. Some students may be assessed to require multiple remedial courses within the same subject area, such as a sequence of remedial math courses. Thus, while this analysis can identify those students who enrolled in and completed remedial coursework within a subject area, it cannot identify whether a student completed the full sequence of required developmental courses. This may then overstate the degree to which students who were assessed to need remediation completed it.

Similarly, as all information regarding assessment is based upon the initial term of enrollment, it is possible that some students would lack a remedial score during the fall semester but be assessed either later in the term or at another subsequent time. Some institutions also give students the ability to challenge their initial assessment by re-testing. A student challenging their score might initially be identified as needing remediation but then not be required to take it. At the individual student level, then, it is possible that there might be a small degree of understatement or overstatement of the need for remediation, which cannot be identified via available data.

As discussed previously in this series, institutions are increasingly adopting co-requisite models for remediation. This poses significant challenges in reporting, particularly at a statewide level. Utilizing a co-requisite remediation model means that institutions must define both what college-ready is and whether courses should be considered as developmental or college-level. While co-requisite courses have a remedial component, a student who successfully completes one of these courses is awarded college credit for their course. Thus, a student may be identified as needing remediation and not completing it, though this would be a reflection of the fact that they enrolled directly in a credit-bearing course. As institutions may interpret these situations differently, the comparability of these data may be somewhat constrained.

The analysis contained in this Part of the series relies upon complete and accurate GPA and credit accumulation data. From the data, it is impossible to identify whether 0 credits accumulated might be a flaw of the data (e.g., no credit data was available) or whether it might accurately reflect that a student did not earn any credits due to failing to complete any courses. For the same reason, a 0.0 GPA is a valid value if a student has not successfully completed any courses, but may possibly represent a data error. Based on a review of the relationship of the two variables, all students who had a *missing* GPA combined with 0 credits were dropped from the analysis.

Finally, the credit data used in this analysis do not distinguish between *native* credits – credits earned at the reporting institution – and all credits awarded, meaning that the number of credits earned by a student reflect credits earned through all methods, including AP/IB testing, early college, and other mechanisms such as credit for life experience or training. This may overstate the number of credits earned by some students, particularly at public four-year colleges and universities. The use of credit thresholds rather than average credit attainment is designed to address this concern.

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[i] As noted in the introduction to this brief, MHEC does not capture data regarding the extent of a student's remedial needs. For example, a student requiring more than one remedial course in a given subject would be identified as a Developmental Completer for that subject even though they had not completed the entire remedial sequence to which they were assigned.

[ii] A small portion of students enrolled in remedial courses while either lacking an assessment status or being identified as college ready. This may be the result of a number of factors, such as a student who had no assessment status during the initial term of enrollment but was later assessed.

[iii] A unique student identifier was used to match demographic data contained in an enrollment file to student course registrations. This file was then matched to another file holding detailed course information.

[iv] This particularly affects students at Morgan State University, which is missing course information for all semesters included in this study.