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MARYLAND HIGHER EDUCATION COMMISSION

Degree Productivity at Maryland's Public Four-Year Institutions from 2007 to 2016

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EXECUTIVE SUMMARY

This report provides information on degree productivity at Maryland's public four-year institutions from 2007 to 2016 using the measure of "degrees per 100 students" for both bachelor's and graduate degrees. Degrees per 100 students provides an assessment of institutional effectiveness on degree productivity over time, which can be used to compare data from other states, and takes into account all students for all degree types regardless of their enrollment or entry status. The measure complements the traditional measure of "graduation rates."

Degrees per 100 students is calculated by dividing the number of total degrees awarded in a given year by the fall full-time equivalent (FTE) enrollment and multiplying the ratio by 100.

Factors such as institutional admission policy, enrollment of part-time and full-time students, and the time students spend in degree programs may affect the rate of degrees per 100 students. This report establishes a baseline for degree productivity to assess and identify changes in institutional effectiveness over time, to provide trends of undergraduate and graduate degree productivity at the state's public four-year institutions during the specified timeframe, and to compare Maryland to its ten competitor states.

The state bachelor's degree productivity rate was 26.1 degrees per 100 students in 2016, making Maryland the most productive state amongst its ten competitor states. This rate increased by 14% from 2007 to 2016. Graduate degree productivity reached 47.8 graduate degrees per 100 students in 2016, making the state second only to New York. This rate also increased by 16% over the past ten years.

This report is projected to be the first in an annual series.

INTRODUCTION

The measure of "graduation rates," which was first introduced by the federal government in the late 1990s, has become a widely used metric to measure degree productivity and to assess student success in higher education institutions and higher education policy. However, only first-time, full-time students are included in the calculation. Thus, the measure of graduation rates is not useful for evaluating the progress of part-time students, transfer students, or returning students.

The measure of "degrees per 100 students" addresses some limitations of the traditional measure of graduation rates. As compared with graduation rates, the measure of degrees per 100 students provides another assessment of institutional effectiveness on degree productivity over time, which can be used to compare data from other states. Originally introduced by the Delta Cost Project, the metric takes into account all students for all degree types regardless of their enrollment or entry status. The measure has also been adopted by other national organizations, including the State Higher Education Executive Officers Association[1] and the Aspen Institute.[2] The measure of degrees per 100 students includes transfer students, returning students, and part-time students, all of whom are excluded in the traditional graduation rate. However, the number of these students grows substantially in two-year and four-year institutions.[3] Thus, this alternative measure provides a fuller picture of student success.

The Maryland Higher Education Commission (MHEC) is reporting degrees per 100 students to complement the traditional measure of graduation rates. This report is the first in a series of reports, to be updated annually, reviewing degrees per 100 students in Maryland's public four-year institutions. The purpose of this report is threefold: to establish the baseline for degree productivity to assess and identify changes in institutional effectiveness over time, to provide trends of undergraduate and graduate degree productivity at the state's public four-year institutions from 2007 to 2016, and to compare Maryland to its competitor states, which include California, Massachusetts, Minnesota, New Jersey, New York, North Carolina, Ohio, Pennsylvania, Virginia, and Washington (see Table 2 and Table 4), using data from the Integrated Postsecondary Education Data System (IPEDS) of the National Center for Education Statistics.[4]

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[1] State Higher Education Executive Officers, *Degree Production and Cost Trends* (Denver: Author, 2010), http://www.sheeo.org/sites/default/files/publications/Degree_Production_and_Cost_Trends.pdf.

[2] The Aspen Institute, *Using Comparative Information to Improve Student Success* (Washington, D.C.: Author, 2014),
https://assets.aspeninstitute.org/content/uploads/files/content/docs/pubs/UsingComparativeInformationGuide.pdf.

[3] National Center for Education Statistics, "Total undergraduate fall enrollment in degree-granting postsecondary institutions, by attendance status, sex of student, and control and level of institution: Selected years, 1970 through 2026," Accessed October 20, 2017, https://nces.ed.gov/programs/digest/d16/tables/dt16_303.70.asp?current=yes.

[4] In its final 2008 report, the Commission to Develop the Maryland Model for Funding Higher Education reported that the State of Maryland competes with the 10 aforementioned states more than any other states in the region or nation with regard to job creation and retention. The report can be found at
http://dls.state.md.us/data/polanasubare/polanasubare_edu/Commission-to-Study-the-Maryland-Model-for-Funding-Higher-Education.pdf.

METHODS

This report focuses specifically on degrees per 100 students at the undergraduate and graduate levels in Maryland's public four-year institutions. The metric is calculated by dividing the number of total degrees awarded in a given year by the fall full-time equivalent (FTE) enrollment and multiplying the ratio by 100.

This report calculates FTE enrollment using the federal headcount formula, which measures FTE enrollment as the sum of all full-time students and one-third of part-time students. This method has been chosen to allow comparisons across states as well as institutions. Consequently, enrollment totals in this report may be slightly different than the totals in other reports that use different methods to calculate FTE enrollment. All raw data for degrees awarded, full-time fall headcount enrollment, and part-time fall headcount enrollment were obtained from the IPEDS database.

INTERPRETATION OF "DEGREES PER 100 STUDENTS" IN BACHELOR'S AND GRADUATE DEGREES

The denominator includes all part-time students and full-time students, while the numerator includes the degrees awarded in a given year. Therefore, an institution will have higher rates of degrees per 100 students if it has fewer FTE students than degrees awarded in a given year. Part-time students are counted as only one-third of FTE students in the denominator and counted as full degree completers in the numerator.

The ideal benchmark for bachelor's degrees per 100 students is 25. That would be the rate for an institution in which all bachelor's-degree-seeking students are admitted as first-time students, and all students graduate in four years. However, several factors may affect how an institution performs on the metric. There are three major factors. First, when more students at an institution have a shorter time to degree, the institution's rate will be higher. For example, institutions with a large share of transfer students will tend to perform better on this measure because transfer students usually take less than four years after transfer to complete their degrees. Second, significant differences in enrollment will affect the measure. Specifically, an institution that enrolls more students will tend to have a smaller number of degrees per 100, while an institution that enrolls fewer students will tend to have a higher number. For example, the University of Baltimore's degrees per 100 students decreased noticeably in 2008-2009, when the university began offering admission to first-time students, which caused the total number of FTE to increase. Third, institutions with a relatively high proportion of part-time students will tend to have lower rates because part-time students take more time to complete their degrees.

Similarly, graduate degrees per 100 are also affected by the same factors. First, programs with a shorter time to degree tend to result in a higher rate. For example, an institution offering relatively more doctoral programs will have a lower rate of graduate degrees per 100 students because doctoral programs take more time to finish than master's programs. Second, institutions with relatively more graduate students will tend to have lower rates and changes in enrollment may cause significant differences in the rate. Third, programs that enroll a larger share of part-time graduate students also will tend to have a lower rate. Finally, it should be noted that there is

no benchmark for graduate degrees per 100, because there are no standard program lengths even within the same degree level; that is, a master's degree may take one, two, or three years of full-time study to complete, and doctoral degrees may take anywhere from three to seven years to complete.

BACHELOR'S DEGREES PER 100 STUDENTS

From 2007 to 2016, Maryland's public colleges and universities were highly productive in bachelor's degrees, as measured in bachelor's degrees per 100 students. During the past ten years the statewide rate of bachelor's degrees per 100 students increased by 14%, from 22.9 in 2007 to 26.1 in 2016 (see Table 1).

Table 1: Bachelor's Degrees Per 100 Students in Maryland Public, Four-Year Institutions, 2007-2016										
Institution Name	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
Bowie State University	17.4	16.3	16.4	16.0	17.9	18.1	19.8	19.6	20.5	22.1
Coppin State University	13.7	10.9	13.0	13.6	13.6	17.5	15.5	19.4	18.5	21.0
Frostburg State University	19.8	19.1	17.4	17.2	18.5	20.2	22.5	23.7	23.6	22.1
Salisbury University	23.0	24.0	23.7	23.5	23.6	24.0	25.1	25.3	25.9	27.0
Towson University	22.5	22.0	21.6	23.1	24.6	25.5	25.3	25.0	25.7	25.4
University of Baltimore	36.6	31.8	28.2	23.8	26.8	26.3	27.1	26.2	27.3	29.2
University of Maryland Baltimore	55.3	54.9	54.7	58.8	58.6	58.7	55.1	55.1	51.9	57.1
University of Maryland Baltimore County	22.8	22.0	20.8	21.3	20.6	22.5	22.6	22.5	23.9	25.0
University of Maryland College Park	25.9	26.0	27.0	26.3	27.7	28.1	29.0	29.3	28.2	28.1
University of Maryland Eastern Shore	12.6	13.3	12.0	12.6	13.6	17.4	14.6	18.0	17.6	17.0
University of Maryland University College	31.1	32.6	30.2	30.8	30.6	30.3	31.4	33.2	30.4	31.8
Morgan State University	14.8	14.7	14.8	13.4	13.3	14.6	16.1	16.1	16.2	15.5
St. Mary's College of Maryland	23.4	22.4	24.9	22.6	21.5	23.5	24.5	24.4	26.1	26.1
State of Maryland*	**22.9**	**22.8**	**22.6**	**22.7**	**23.5**	**24.5**	**25.2**	**25.7**	**25.6**	**26.1**
Source: National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS)										
Note: Degrees per 100 students is calculated by using the total number of bachelor's degrees awarded by an institution, dividing by the respective institution's undergraduate FTE enrollment, and then multiplying by 100.										

At the institutional level, 12 of the 13 public four-year institutions in Maryland had greater degree productivity in the 2015-2016 academic year than in the 2006-2007 academic year. Five institutions reached their most productive rates in the 2015-2016 academic year: Bowie State University, Coppin State University, Salisbury University, University of Maryland Baltimore County, and St. Mary's College of Maryland. Furthermore, four institutions consistently exceeded annual statewide average rates: the University of Baltimore, University of Maryland Baltimore, University of Maryland College Park, and University of Maryland University College (Table 1). As noted above, the large number of transfer students enrolled at these institutions likely accounts for the higher rates. This is true even though the University of Baltimore and the University of Maryland University College enroll the highest share of part-time students.

A comparison of statewide rates shows that Maryland's bachelor's degree productivity rate was higher than those of its ten competitor states (see Table 2). Prior to 2013, California was the highest achieving state amongst Maryland and its other competitor states in bachelor's degree productivity. Since 2013, however, Maryland has exceeded California. Additionally, Maryland and eight of its competitor states all showed significant net growth in degree productivity in the past decade. The two states that showed little net growth were California and Washington.

Table 2: Statewide Average Bachelor's Degrees per 100 Students, 2007-2016										
State	**2006-07**	**2007-08**	**2008-09**	**2009-10**	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**
Maryland	22.9	22.8	22.6	22.7	23.5	24.5	25.2	25.7	25.6	26.1
New Jersey	23.8	23.2	23.0	22.8	22.9	23.9	24.6	24.9	25.0	25.2
California	24.6	24.3	24.1	24.5	25.6	24.7	25.0	24.8	24.4	24.8
Virginia	21.7	21.8	21.7	21.8	22.2	23.1	23.1	23.1	23.5	24.1
Massachusetts	20.0	19.9	20.0	20.4	20.9	21.7	22.4	23.1	23.6	23.9
Minnesota	20.6	20.7	20.9	20.5	20.9	22.2	22.7	22.8	23.4	23.6
North Carolina	19.4	20.0	20.1	20.4	21.1	22.1	22.6	23.0	22.9	23.1
New York	19.3	19.3	19.3	19.4	20.5	20.8	21.6	22.0	21.9	22.6
Pennsylvania	19.9	19.6	19.8	20.2	20.3	21.1	21.3	22.1	22.2	22.2
Ohio	18.1	17.9	17.6	16.9	17.2	18.6	18.9	19.7	20.5	20.5
Washington	15.4	15.2	14.9	14.4	14.7	15.4	15.6	15.3	15.8	16.0
Source: National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS)										
*Maryland's statewide average excludes data on the United States Naval Academy.										
Note: Degrees per 100 students is calculated by using the total number of bachelor's degrees awarded by the state's public, four-year institutions, dividing by the statewide undergraduate FTE enrollment, and then multiplying by 100.										

Maryland and its competitor states experienced statewide declines in bachelor's degree productivity in the beginning of the decade. The existence of common trends in degree productivity across all of these states suggests that the changes in the rates in Maryland may be attributed to factors beyond the institution's or state's control. For example, the National Center for Education Statistics reported that undergraduate enrollment, including both part-time and full-time students, increased by 15% from 2007 to 2010 in the U.S. but decreased by 2% from 2010 to 2016. The increase in undergraduate enrollment was likely due to the Great Recession because unemployed individuals are more likely to attend college.[5]

GRADUATE DEGREES PER 100 STUDENTS

At the graduate level, Maryland's statewide rate grew from 41.1 graduate degrees per 100 students in 2007 to 47.8 graduate degrees per 100 students in 2016, an increase of 16% over the past ten years (see Table 3). Although the rates of graduate degree productivity fluctuated more

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[5] National Center for Education Statistics, "Total fall enrollment in degree-granting postsecondary institutions, by attendance status, sex of student, and control of institution: Selected years, 1947 through 2025," Accessed October 6, 2017, https://nces.ed.gov/programs/digest/d15/tables/dt15_303.10.asp?current=yes.

than those of bachelor's degrees, nine of Maryland's public four-year institutions experienced greater graduate degree productivity in 2016 than in 2007.

Table 3: Graduate Degrees per 100 Students in Maryland's Public, Four-Year Institutions, 2007-2016										
Institution Name	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
Bowie State University	62.6	57.4	53.9	41.5	35.8	44.8	43.1	40.5	41.3	50.5
Coppin State University	26.4	27.0	23.1	26.4	31.2	21.0	28.1	34.2	30.0	32.4
Frostburg State University	73.7	66.5	60.4	61.8	59.0	45.0	53.5	58.7	63.8	51.5
Salisbury University	56.7	62.8	58.5	55.0	54.7	56.1	66.7	63.4	54.7	49.9
Towson University	56.8	52.6	49.9	46.9	48.4	51.6	56.1	55.6	59.0	55.9
University of Baltimore	38.7	35.5	35.1	41.3	38.3	40.9	42.0	40.9	42.5	45.3
University of Maryland Baltimore	31.9	33.3	32.1	33.0	33.5	35.9	34.3	34.4	36.5	35.8
University of Maryland Baltimore County	37.0	35.3	34.7	35.3	41.1	41.5	37.7	40.3	47.9	45.6
University of Maryland College Park	34.0	34.5	34.1	35.7	35.5	36.0	38.9	39.6	37.0	38.7
University of Maryland Eastern Shore	26.2	29.6	36.7	24.7	31.9	28.5	28.7	32.7	27.3	34.4
University of Maryland University College	59.6	56.1	56.4	62.3	65.9	66.3	82.4	83.8	85.5	85.0
Morgan State University	24.8	29.7	36.8	28.3	29.4	31.8	32.4	33.6	32.5	26.5
St. Mary's College of Maryland	66.7	104.5	93.3	90.7	94.3	86.7	91.3	77.4	91.6	88.9
State of Maryland*	**41.1**	**40.4**	**39.9**	**41.6**	**42.7**	**43.7**	**47.5**	**47.6**	**48.0**	**47.8**
Source: National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS)										
Note: Degrees per 100 students is calculated by using the total number of master's and advanced degrees awarded by an institution, dividing by the respective institution's graduate FTE enrollment, and then multiplying by 100.										

Institutions where doctoral degrees comprise the largest portion of graduate degrees awarded tend to have lower rates of graduate degrees per 100 students than institutions that predominately award masters degrees. For example, three institutions where doctoral degrees are the largest portion of graduate degrees awarded - University of Maryland College Park, University of Maryland Eastern Shore, and Morgan State University - have lower rates of degree productivity than institutions that primarily award master's degrees at the graduate level, including Bowie State University, Frostburg State University, and Salisbury University, where 85% of graduate degrees awarded were master's degrees.

Further, St. Mary's College of Maryland consistently maintained high rates and had almost a 100% rate of graduate degrees per 100 students throughout the decade. Its sole graduate program, the Master of Arts in Teaching (MAT) program, has a very short time to degree – only one year – which may be the major contributing factor to its high degree productivity rate.

A comparison of statewide rates shows that Maryland's graduate degrees per 100 students increased by almost 16% over the past ten years, which is the second largest increase among its ten competitor states (see Table 4). All of Maryland's top competitor states achieved greater

rates of graduate degree productivity in 2016 than in 2007. California had the largest increase (20%) from 2007 to 2016 and achieved the rate of 43 graduate degrees per 100 students in 2016. Finally, five state competitors – California, Massachusetts, Minnesota, North Carolina, and Ohio – exhibited greater graduate degree productivity in 2016 than in 2007 and demonstrated more consistent growth patterns similar to those of Maryland.

Table 4: Statewide Average Graduate Degrees per 100 Students, 2007-2016										
State	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
New York	48.2	47.2	46.2	47.3	48.6	50.6	50.2	49.8	50.5	50.2
Maryland	41.1	40.4	39.9	41.6	42.7	43.7	47.5	47.6	48.0	47.8
Massachusetts	43.0	42.2	43.2	44.2	43.8	44.9	46.1	48.0	46.4	47.7
New Jersey	47.0	47.5	46.6	45.3	45.4	47.9	47.8	45.5	45.3	47.2
North Carolina	41.6	41.8	42.0	41.8	44.0	45.1	45.6	46.3	45.3	47.1
Ohio	40.3	38.2	36.7	41.3	41.4	44.8	43.3	43.7	45.8	46.4
Pennsylvania	43.9	37.0	40.2	44.3	44.9	46.3	45.5	45.7	45.1	45.4
Virginia	41.3	40.5	39.9	42.5	42.6	43.5	43.8	44.4	44.6	43.8
California	36.1	35.7	36.1	37.5	41.1	41.4	42.0	41.1	40.7	43.3
Minnesota	39.6	39.7	38.4	40.3	41.8	42.9	42.6	42.9	42.8	43.0
Washington	39.0	38.6	42.5	37.4	39.7	39.4	40.5	39.5	40.0	39.4
Source: National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS)										
*Maryland's statewide average excludes data on the United States Naval Academy. Note: Degrees per 100 students is calculated by using the total number of master's and advanced degrees awarded by the state's public, four-year institutions, dividing by the statewide graduate FTE enrollment, and then multiplying by 100.										

CONCLUSION

With a 14% increase from 2007 to 2016, the state bachelor's degree productivity rate reached 26.1 degrees per 100 students and Maryland became the most productive state amongst its ten competitor states. Maryland's public colleges and universities significantly improved bachelor's degree productivity in the post-recessionary years and experienced net increases in bachelor's degrees per 100 students over the course of the decade. Maryland's public colleges and universities have served more students over the past ten years and have better prepared them for positive career prospects given that college graduates make up the majority of the workforce in what some analysts have labeled "good jobs."[6]

Relative to its competitor states, Maryland also saw significant progress in graduate degrees per 100 students, with an increase of 16% over the past ten years, and achieved 47.8 graduate degrees per 100 students in 2016, second only to New York.

The rate of degrees per 100 students fluctuates in Maryland's public four-year institutions and may be affected by many factors, including institutional admission policy, enrollment of part-

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[6] Anthony P. Carnevale, Tamara Jayasundera, and Artem Gulish, *Good Jobs are Back* (Washington, D.C.: Center on Education and the Workforce, 2015), https://cew.georgetown.edu/cew-reports/goodjobsareback/#full-report.

time and full-time students, the types of graduate degrees awarded, and the time students spend in graduate programs. Results for institutional degrees per 100 students in both bachelor's degrees and graduate degrees need to be carefully interpreted while taking unique institutional features into account.

Notwithstanding these factors, the increase in degrees per 100 students in bachelor's degrees and graduate degrees from 2007 to 2016 contributed to Maryland's progress in improving bachelor's degree and graduate degree productivity. This information provides further evidence that Maryland's public four-year institutions are successfully strengthening the workforce and bolstering Maryland's economy.