STATE COUNCIL OF HIGHER EDUCATION FOR VIRGINIA

# Progress in Meeting Degree Production in Data Science & Technology, Education, Healthcare and Science & Engineering,

January 2023

In the 2018 session, the General Assembly approved a total of $28.4 million to increase production of degree awards in the areas of data science and technology, education, healthcare and science and engineering. The funding, targeted towards public four-year institutions (except University of Virginia's College at Wise), included budget language that identified an expected annual increase by institution and area, totaling 880 awards by 2020 using 2016-17 awards as the baseline year. The awards included bachelor, master, doctoral and first professional degrees identified primarily through the classification of instructional programs (CIP).

In 2020, awards in all areas grew from 22,008 in 2017 to 24,090, an increase of 2,082, exceeding the state's total goal of 880 additional awards by 2020. Between 2020 and 2022, institutions continued the growth by adding an additional 571 awards for a total increase of 2,653 awards.

The following provides an overview of total annual awards by award area and institution with comparison data to the goals outlined in the budget language.

## Overall Awards

Total awards in the programs identified in the budget language grew by 2,653 between 2017 and 2022. Table 1 provides annual awards by year.

**Table 1. Total Degrees Awarded between 2017 and 2022**

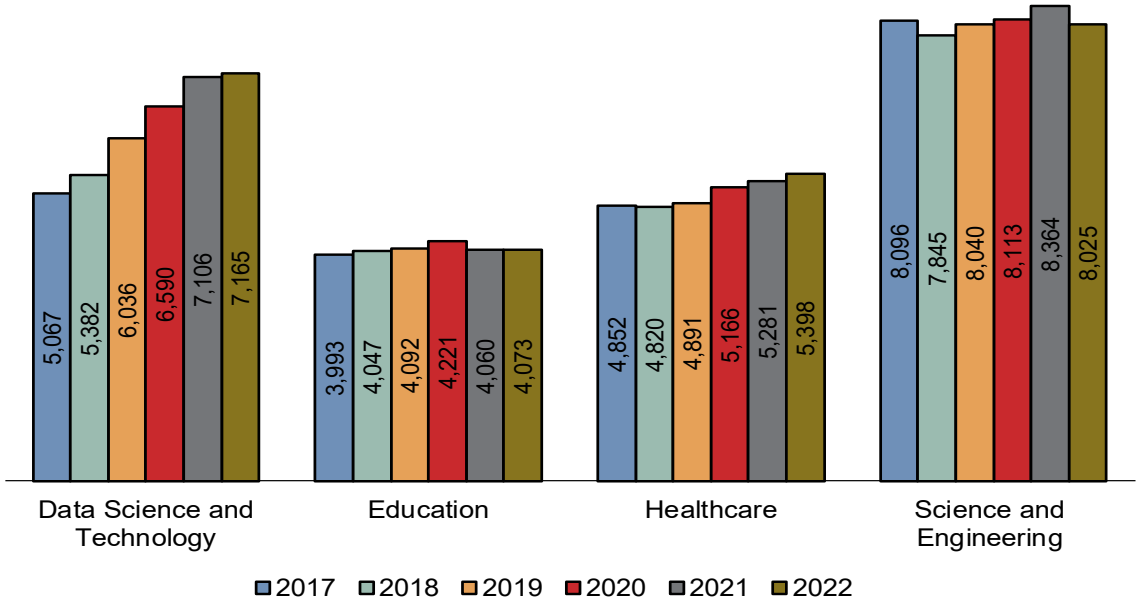
| Area (2 Digit CIP Code) | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 |
|---|---|---|---|---|---|---|
| Data Science and Tech (11,14,27,52) | 5,067 | 5,382 | 6,036 | 6,590 | 7,106 | 7,165 |
| Education (13) | 3,993 | 4,047 | 4,092 | 4,221 | 4,060 | 4,073 |
| Healthcare (51) | 4,852 | 4,820 | 4,891 | 5,166 | 5,281 | 5,398 |
| Science and Engineering (14*) | 8,096 | 7,845 | 8,040 | 8,113 | 8,364 | 8,025 |
| **Grand Total** | **22,008** | **22,094** | **23,059** | **24,090** | **24,811** | **24,661** |

*Excludes CIP 14.0901, 14.0903, and 14.1001 as they are reported as data science and technology degrees.

Awards in Data Science & Technology, Education, Healthcare and Science & Engineering

The primary growth was in the data science and technology area, which grew by 41% since 2017. The next largest growth was in healthcare (11%) and education (2%). Science and engineering has declined by less than 1% since 2017. Chart 1 illustrates degree growth by area.

**Chart 1: Annual degrees awarded by area**




As noted in budget language, institutions were asked to increase their total award production by 880 by 2020. Table 2 provides the expected increase over the 2017 baseline year and the actual annual increase from 2018 to 2022.

**Table 2: Annual award change over base year (2016-17) compared to expected annual growth**

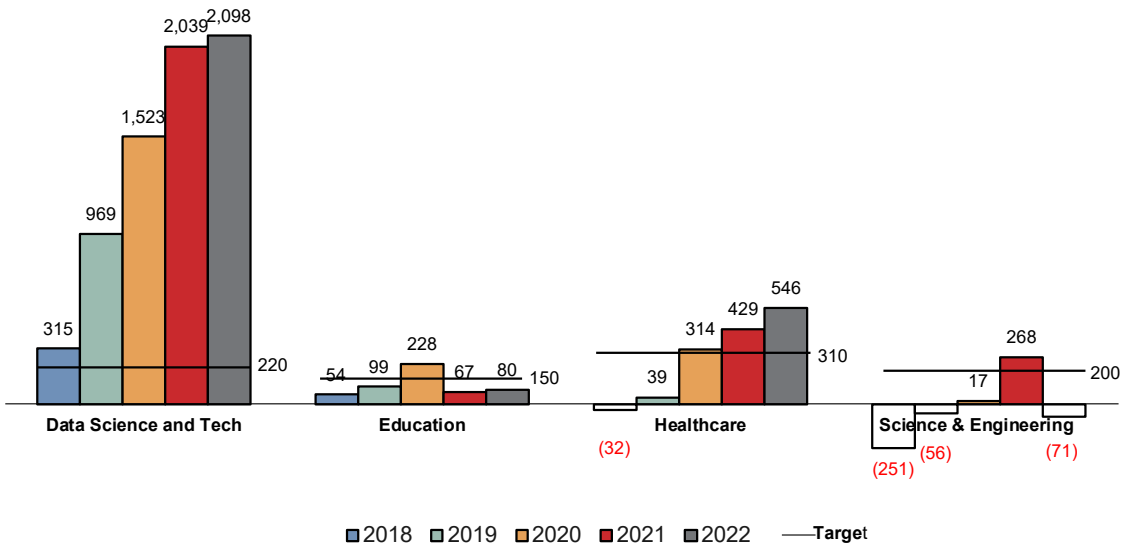
| | Expected Annual Increase by 2020 | 2018 Annual Change over 2017 | 2019 Annual Change over 2017 | 2020 Annual Change over 2017 | 2021 Annual Change over 2017 | 2022 Annual Change over 2017 |
|---|---|---|---|---|---|---|
| Data Science and Tech (11,14,27,52) | 220 | 315 | 969 | 1,523 | 2,039 | 2,098 |
| Education (13) | 150 | 54 | 99 | 228 | 67 | 80 |
| Healthcare (51) | 200 | (32) | 39 | 314 | 429 | 546 |
| Science and Engineering (14*) | 310 | (251) | (56) | 17 | 268 | (71) |
| **Grand Total** | **880** | **86** | **1,051** | **2,082** | **2,803** | **2,653** |

*Excludes CIP 14.0901, 14.0903, and 14.1001 as they are reported as data science and technology degrees.

Awards in Data Science & Technology, Education, Healthcare and Science & Engineering

Chart 2 illustrates the comparison of the annual changes and target. It should be noted that the overall target for science and engineering was not met between 2020 and 2022; education was not met in 2021 and 2022. Healthcare met the growth goal between 2020 and 2022. The growth of data science and technology awards far surpassed its goal by 2020 but slowed down in 2022.

**Chart 2: Expected Annual Change over Base Year 2017 by Area Compared to Expected Annual Growth**




## Awards by Institution

The majority of institutions increased the total degrees produced in these areas between 2017 and 2022. Four institutions. CNU, ODU, NSU and VSU, have seen a continuous decline in enrollment from fall 2014 to fall 2018. Given the traditional four-year path to a bachelor's degree, this smaller cohort likely contributed to the decreased degree production.

A report on the impact of changes in federal Parental Loans for Undergraduate Students (PLUS) indicated that HBCUs were disproportionately impacted and experienced larger enrollment declines compared to other institutions. As ODU also has a higher percentage of low-income students, the changes to the PLUS loans may have impacted ODU and contributed to its lower awards in these areas.

Awards in Data Science & Technology, Education, Healthcare and Science & Engineering

Conversely, some institutions saw continuous growth that may have led to the increased degree production. For example, GMU's undergraduate enrollment increased by about 4,000 between fall 2014 and fall 2018.

**Table 3: Total data science and technology, science and engineering, healthcare, and education awards by institution, 2017 to 2022**

| Inst. | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 |
|---|---|---|---|---|---|---|
| CNU | 396 | 379 | 405 | 385 | 427 | 369 |
| GMU | 3,698 | 3,913 | 4,148 | 4,369 | 4,628 | 4,254 |
| JMU | 1,973 | 2,018 | 2,019 | 2,170 | 2,247 | 2,125 |
| LU | 322 | 342 | 326 | 323 | 334 | 413 |
| NSU | 385 | 346 | 257 | 277 | 256 | 298 |
| ODU | 3,060 | 2,983 | 2,900 | 2,879 | 2,892 | 2,847 |
| RU | 700 | 678 | 745 | 1,028 | 987 | 948 |
| UMW | 357 | 327 | 356 | 424 | 390 | 410 |
| UVA | 2,589 | 2,690 | 3,042 | 3,212 | 3,438 | 3,647 |
| VCU | 3,110 | 3,043 | 3,215 | 3,190 | 3,220 | 3,179 |
| VMI | 183 | 226 | 183 | 180 | 203 | 191 |
| VSU | 308 | 287 | 266 | 264 | 246 | 230 |
| VT | 4,158 | 4,064 | 4,443 | 4,585 | 4,757 | 4,737 |
| WM | 769 | 798 | 754 | 804 | 786 | 1,013 |
| **Total** | **22,008** | **22,094** | **23,059** | **24,090** | **24,811** | **24,661** |

Table 4 shows the annual increase in STEM-H degree awards over the 2017 base year. Since 2019, the annual total STEM-H degree awards exceeded the expected annual total goal. However, several institutions did not meet their individual expected total annual increases, as described in the budget language. Besides the four institutions mentioned above that their continuous decline in enrollment affected their degree production, LU, VCU, VMI and WM also had fluctuations in their annual degree productions. One area to note is that Radford's primary growth was in healthcare, which was largely a result of the merger with the Jefferson College of Health Sciences.

Awards in Data Science & Technology, Education, Healthcare and Science & Engineering

**Table 4: Annual Award Change Over Base Year 2017 Compared to Expected Annual Growth by Institution**

| | Expected Total Annual Increase | 2017 Base Year | 2018 Annual Change over 2017 | 2019 Annual Change over 2017 | 2020 Annual Change over 2017 | 2021 Annual Change over 2017 | 2022 Annual Change over 2017 |
|---|---|---|---|---|---|---|---|
| CNU | 20 | 396 | (17) | 9 | (11) | 31 | (27) |
| GMU | 160 | 3,698 | 215 | 450 | 671 | 930 | 556 |
| JMU | 85 | 1,973 | 45 | 46 | 197 | 274 | 152 |
| LU | 15 | 322 | 20 | 4 | 1 | 12 | 91 |
| NSU | 20 | 385 | (39) | (128) | (108) | (129) | (87) |
| ODU | 125 | 3,060 | (77) | (160) | (181) | (168) | (213) |
| RU | 30 | 700 | (22) | 45 | 328 | 287 | 248 |
| UMW | 10 | 357 | (30) | (1) | 67 | 33 | 53 |
| UVA | 80 | 2,589 | 101 | 453 | 623 | 849 | 1,058 |
| VCU | 110 | 3,110 | (67) | 105 | 80 | 110 | 69 |
| VMI | 10 | 183 | 43 | 0 | (3) | 20 | 8 |
| VSU | 15 | 308 | (21) | (42) | (44) | (62) | (78) |
| VT | 160 | 4,158 | (94) | 285 | 427 | 599 | 579 |
| WM | 40 | 769 | 29 | (15) | 35 | 17 | 244 |
| **Total** | **880** | **22,008** | **86** | **1,051** | **2,082** | **2,803** | **2,653** |

The following tables provide awards by area and annual changes in awards from 2017 to 2022. Tables 5.1 through 5.4 shows the annual degree awards by area and institution. Tables 6.1 to 6.4 shows the expected annual degree increase and the actual annual degree change over the 2017 base year. For the degree production in science and technology, Table 6.4 shows only GMU and UMW produced more than their expected annual award increases consistently between 2020 and 2022. UVA met its goal in 2021 and 2022 and VT met its goal in 2020 and 2021. The rest of institutions failed to produce their expected annual award increases over the 2017 base year from 2018 to 2022.

Awards in Data Science & Technology, Education, Healthcare and Science & Engineering

**Table 5.1: Annual Awards in Data Science and Technology**

| Inst. | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 |
|---|---|---|---|---|---|---|
| CNU | 107 | 109 | 129 | 130 | 147 | 126 |
| GMU | 1,313 | 1,434 | 1,527 | 1,683 | 1,876 | 1,723 |
| JMU | 297 | 312 | 317 | 365 | 359 | 318 |
| LU | 26 | 29 | 29 | 30 | 19 | 21 |
| NSU | 85 | 82 | 59 | 77 | 65 | 95 |
| ODU | 382 | 420 | 442 | 477 | 514 | 521 |
| RU | 93 | 92 | 108 | 69 | 82 | 75 |
| UMW | 74 | 69 | 90 | 92 | 75 | 84 |
| UVA | 572 | 590 | 956 | 1,203 | 1,306 | 1,326 |
| VCU | 454 | 456 | 441 | 464 | 476 | 517 |
| VMI | 38 | 64 | 55 | 50 | 58 | 57 |
| VSU | 79 | 76 | 60 | 70 | 75 | 59 |
| VT | 1,320 | 1,400 | 1,592 | 1,608 | 1,774 | 1,854 |
| WM | 227 | 249 | 231 | 272 | 280 | 389 |
| **Total** | **5,067** | **5,382** | **6,036** | **6,590** | **7,106** | **7,165** |

**Table 5.2: Annual Awards in Education**

| Inst. | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 |
|---|---|---|---|---|---|---|
| CNU | 70 | 77 | 60 | 52 | 49 | 47 |
| GMU | 907 | 954 | 1,026 | 1,115 | 1,053 | 834 |
| JMU | 325 | 362 | 334 | 386 | 372 | 396 |
| LU | 111 | 137 | 86 | 116 | 167 | 217 |
| NSU | 71 | 70 | 69 | 43 | 36 | 37 |
| ODU | 708 | 663 | 615 | 602 | 608 | 586 |
| RU | 286 | 264 | 285 | 294 | 276 | 239 |
| UMW | 120 | 106 | 106 | 133 | 113 | 119 |
| UVA | 314 | 358 | 404 | 388 | 349 | 482 |
| VCU | 559 | 552 | 655 | 652 | 659 | 627 |
| VMI | | | | | | |
| VSU | 116 | 115 | 85 | 76 | 56 | 93 |
| VT | 261 | 214 | 206 | 190 | 182 | 171 |
| WM | 145 | 175 | 161 | 174 | 140 | 225 |
| **Total** | **3,993** | **4,047** | **4,092** | **4,221** | **4,060** | **4,073** |

Awards in Data Science & Technology, Education, Healthcare and Science & Engineering

**Table 5.3: Annual Awards in Healthcare**

| Inst. | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 |
|---|---|---|---|---|---|---|
| CNU | | | | | | |
| GMU | 700 | 701 | 726 | 744 | 831 | 798 |
| JMU | 976 | 979 | 1,011 | 1,042 | 1,087 | 1,034 |
| LU | 112 | 115 | 143 | 112 | 106 | 135 |
| NSU | 103 | 92 | 71 | 73 | 59 | 76 |
| ODU | 1,004 | 964 | 890 | 853 | 855 | 904 |
| RU | 188 | 210 | 218 | 522 | 515 | 542 |
| UMW | 22 | 30 | 40 | 52 | 48 | 55 |
| UVA | 508 | 534 | 524 | 532 | 552 | 589 |
| VCU | 1,197 | 1,159 | 1,203 | 1,153 | 1,145 | 1,115 |
| VMI | | | | | | |
| VSU | | | | | | 1 |
| VT | 42 | 36 | 65 | 83 | 83 | 149 |
| WM | | | | | | |
| **Total** | **4,852** | **4,820** | **4,891** | **5,166** | **5,281** | **5,398** |

**Table 5.4: Annual Awards in Science and Engineering***

| Inst. | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 |
|---|---|---|---|---|---|---|
| CNU | 219 | 193 | 216 | 203 | 231 | 196 |
| GMU | 778 | 824 | 869 | 827 | 868 | 899 |
| JMU | 375 | 365 | 357 | 377 | 429 | 377 |
| LU | 73 | 61 | 68 | 65 | 42 | 40 |
| NSU | 126 | 102 | 58 | 84 | 96 | 90 |
| ODU | 966 | 936 | 953 | 947 | 915 | 836 |
| RU | 133 | 112 | 134 | 143 | 114 | 92 |
| UMW | 141 | 122 | 120 | 147 | 154 | 152 |
| UVA | 1,195 | 1,208 | 1,158 | 1,089 | 1,231 | 1,250 |
| VCU | 900 | 876 | 916 | 921 | 940 | 920 |
| VMI | 145 | 162 | 128 | 130 | 145 | 134 |
| VSU | 113 | 96 | 121 | 118 | 115 | 77 |
| VT | 2,535 | 2,414 | 2,580 | 2,704 | 2,718 | 2,563 |
| WM | 397 | 374 | 362 | 358 | 366 | 399 |
| **Total** | **8,096** | **7,845** | **8,040** | **8,113** | **8,364** | **8,025** |

Note: *excludes CIP 14.0901, 14.0903, and 14.1001 as they are reported as Data Science and Technology degree awards.

**Table 6.1: Annual Award Change over 2017 Base Year in Data Science and Technology**

| Inst. | Expected Annual Increase by 2020 | 2018 Annual Change over 2017 | 2019 Annual Change over 2017 | 2020 Annual Change over 2017 | 2021 Annual Change over 2017 | 2022 Annual Change over 2017 |
|---|---|---|---|---|---|---|
| CNU | 5 | 2 | 22 | 23 | 40 | 19 |
| GMU | 50 | 121 | 214 | 370 | 563 | 410 |
| JMU | 10 | 15 | 20 | 68 | 62 | 21 |
| LU | | 3 | 3 | 4 | (7) | (5) |
| NSU | 5 | (3) | (26) | (8) | (20) | 10 |
| ODU | 15 | 38 | 60 | 95 | 132 | 139 |
| RU | 5 | (1) | 15 | (24) | (11) | (18) |
| UMW | | (5) | 16 | 18 | 1 | 10 |
| UVA | 20 | 18 | 384 | 631 | 734 | 754 |
| VCU | 20 | 2 | (13) | 10 | 22 | 63 |
| VMI | 5 | 26 | 17 | 12 | 20 | 19 |
| VSU | 5 | (3) | (19) | (9) | (4) | (20) |
| VT | 60 | 80 | 272 | 288 | 454 | 534 |
| WM | 20 | 22 | 4 | 45 | 53 | 162 |
| **Total** | **220** | **315** | **969** | **1,523** | **2,039** | **2,098** |

**Table 6.2: Annual Award Change over 2017 Base Year in Education**

| Inst. | Expected Annual Increase by 2020 | 2018 Annual Change over 2017 | 2019 Annual Change over 2017 | 2020 Annual Change over 2017 | 2021 Annual Change over 2017 | 2022 Annual Change over 2017 |
|---|---|---|---|---|---|---|
| CNU | | 7 | (10) | (18) | (21) | (23) |
| GMU | 40 | 47 | 119 | 208 | 146 | (73) |
| JMU | 15 | 37 | 9 | 61 | 47 | 71 |
| LU | 5 | 26 | (25) | 5 | 56 | 106 |
| NSU | 5 | (1) | (2) | (28) | (35) | (34) |
| ODU | 30 | (45) | (93) | (106) | (100) | (122) |
| RU | 10 | (22) | (1) | 8 | (10) | (47) |
| UMW | 5 | (14) | (14) | 13 | (7) | (1) |
| UVA | 10 | 44 | 90 | 74 | 35 | 168 |
| VCU | 20 | (7) | 96 | 93 | 100 | 68 |
| VMI | | | | | | |
| VSU | 5 | (1) | (31) | (40) | (60) | (23) |
| VT | | (47) | (55) | (71) | (79) | (90) |
| WM | 5 | 30 | 16 | 29 | (5) | 80 |
| **Total** | **150** | **54** | **99** | **228** | **67** | **80** |

**Table 6.3: Annual Award Change over 2017 Base Year in Healthcare**

| Inst. | Expected Annual Increase by 2020 | 2018 Annual Change over 2017 | 2019 Annual Change over 2017 | 2020 Annual Change over 2017 | 2021 Annual Change over 2017 | 2022 Annual Change over 2017 |
|---|---|---|---|---|---|---|
| CNU | | | | | | |
| GMU | 35 | 1 | 26 | 44 | 131 | 98 |
| JMU | 45 | 3 | 35 | 66 | 111 | 58 |
| LU | 5 | 3 | 31 | 0 | (6) | 23 |
| NSU | 5 | (11) | (32) | (30) | (44) | (27) |
| ODU | 40 | (40) | (114) | (151) | (149) | (100) |
| RU | 10 | 22 | 30 | 334 | 327 | 354 |
| UMW | | 8 | 18 | 30 | 26 | 33 |
| UVA | 20 | 26 | 16 | 24 | 44 | 81 |
| VCU | 40 | (38) | 6 | (44) | (52) | (82) |
| VMI | | | | | | |
| VSU | | | | | | 1 |
| VT | | (6) | 23 | 41 | 41 | 107 |
| WM | | | | | | |
| **Total** | **200** | **(32)** | **39** | **314** | **429** | **546** |

**Table 6.4: Annual Award Change over 2017 Base Year in Science and Engineering***

| Inst. | Expected Annual Increase by 2020 | 2018 Annual Change over 2017 | 2019 Annual Change over 2017 | 2020 Annual Change over 2017 | 2021 Annual Change over 2017 | 2022 Annual Change over 2017 |
|---|---|---|---|---|---|---|
| CNU | 15 | (26) | (3) | (16) | 12 | (23) |
| GMU | 35 | 46 | 91 | 49 | 90 | 121 |
| JMU | 15 | (10) | (18) | 2 | 54 | 2 |
| LU | 5 | (12) | (5) | (8) | (31) | (33) |
| NSU | 5 | (24) | (68) | (42) | (30) | (36) |
| ODU | 40 | (30) | (13) | (19) | (51) | (130) |
| RU | 5 | (21) | 1 | 10 | (19) | (41) |
| UMW | 5 | (19) | (21) | 6 | 13 | 11 |
| UVA | 30 | 13 | (37) | (106) | 36 | 55 |
| VCU | 30 | (24) | 16 | 21 | 40 | 20 |
| VMI | 5 | 17 | (17) | (15) | 0 | (11) |
| VSU | 5 | (17) | 8 | 5 | 2 | (36) |
| VT | 100 | (121) | 45 | 169 | 183 | 28 |
| WM | 15 | (23) | (35) | (39) | (31) | 2 |
| **Total** | **310** | **(251)** | **(56)** | **17** | **268** | **(71)** |

Note: *excludes CIP 14.0901, 14.0903, and 14.1001 as they are reported as Data Science and Technology Degree Awards.