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.
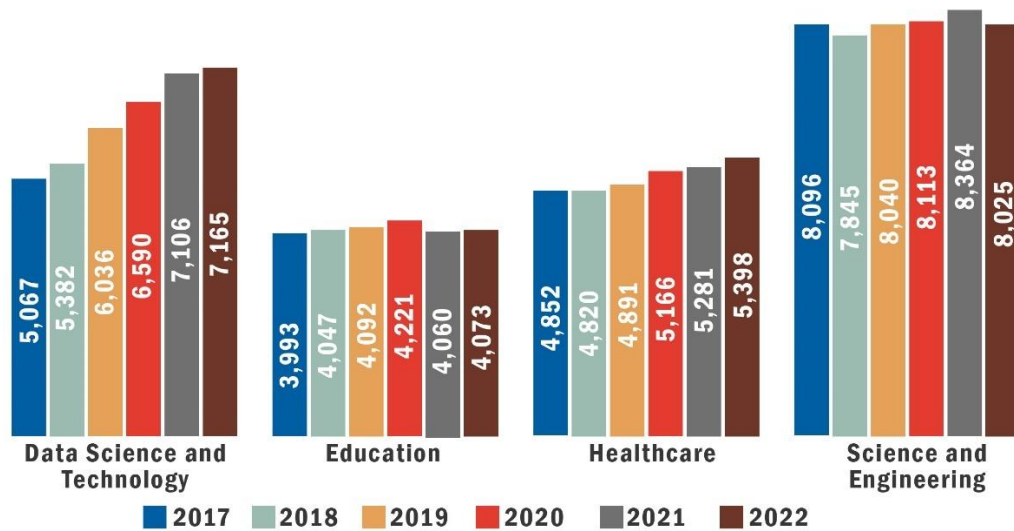
Table 1. Total Degrees Awarded between 2017 and 2022

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.

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

Data Science and Technology: 5,067 (2017); 5,382 (2018); 6,036 (2019); 6,590 (2020); 7,106 (2021); 7,165 (2022)

Education: 3,993 (2017); 4,047 (2018); 4,092 (2019); 4,221 (2020); 4,060 (2021); 4,073 (2022)

Healthcare: 4,852 (2017); 4,820 (2018); 4,891 (2019); 5,166 (2020); 5,281 (2021); 5,398 (2022)

Science and Engineering: 8,096 (2017); 7,845 (2018); 8,040 (2019); 8,113 (2020); 8,364 (2021); 8,025 (2022)

■ 2017 ■ 2018 ■ 2019 ■ 2020 ■ 2021 ■ 2022

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.

Chart 2 illustrates the comparison of the annual changes and target. The overall target for science and engineering has not been met for any of the last three years. Also, 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 surpassed the goal by 2020 but slowed down in 2022. The following section identifies the changes by institution.

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

Legend: ■ 2018 ■ 2019 ■ 2020 ■ 2021 ■ 2022 ···· Target
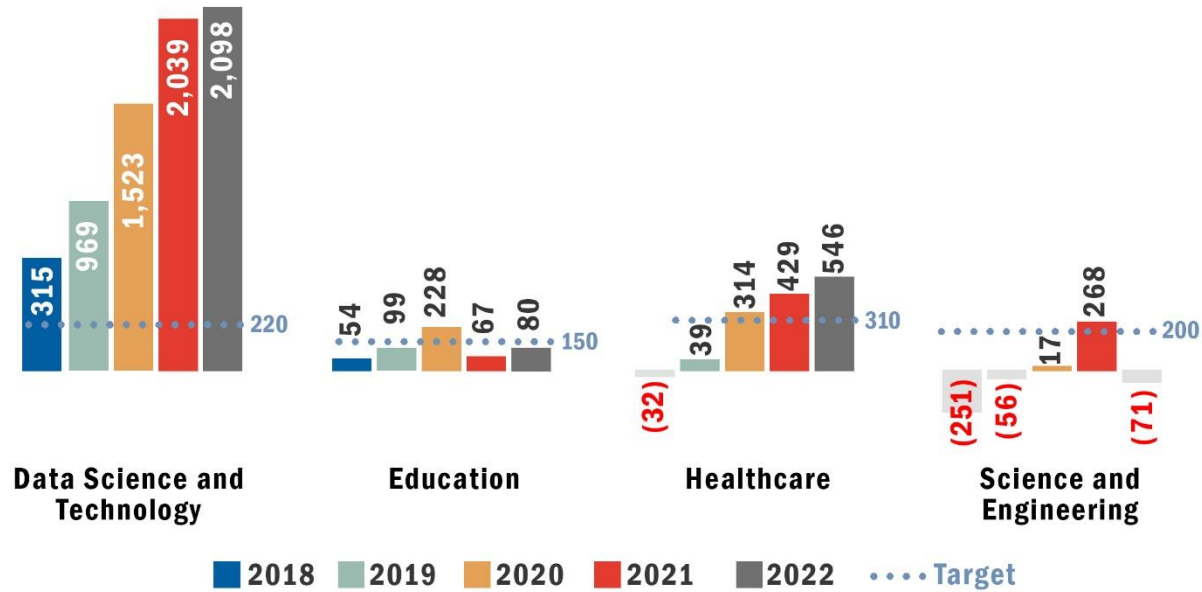
Awards by Institution

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.

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

	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 (whose continuous decline in enrollment affected their degree production), LU, VCU, VMI and W&M 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.

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.

Table 5.1: Annual Awards in Data Science and Technology

	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

	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**

Table 5.3: Annual Awards in Healthcare

	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*

	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

	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

	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

	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 Chang e over 2017 Base Year in Science and Engineering*

	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.