

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

January 2022

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, technology, science, engineering, healthcare and education. The funding, targeted towards public four-year institutions (except University of Virginia 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, the state exceeded the total goal of 880 additional awards. Awards in all areas grew from 22,008 in 2017 to 24,090—an increase of 2,082. Awards in 2021 continued to maintain over 2017 levels but grew slightly (306) from the prior year.

The following provides an overview of overall annual award data 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 2,388 from 22,008 to 24,396 in 2021. Table 1 provided annual awards by year.

Table 1: Total Degrees Awarded 2017 to 2021

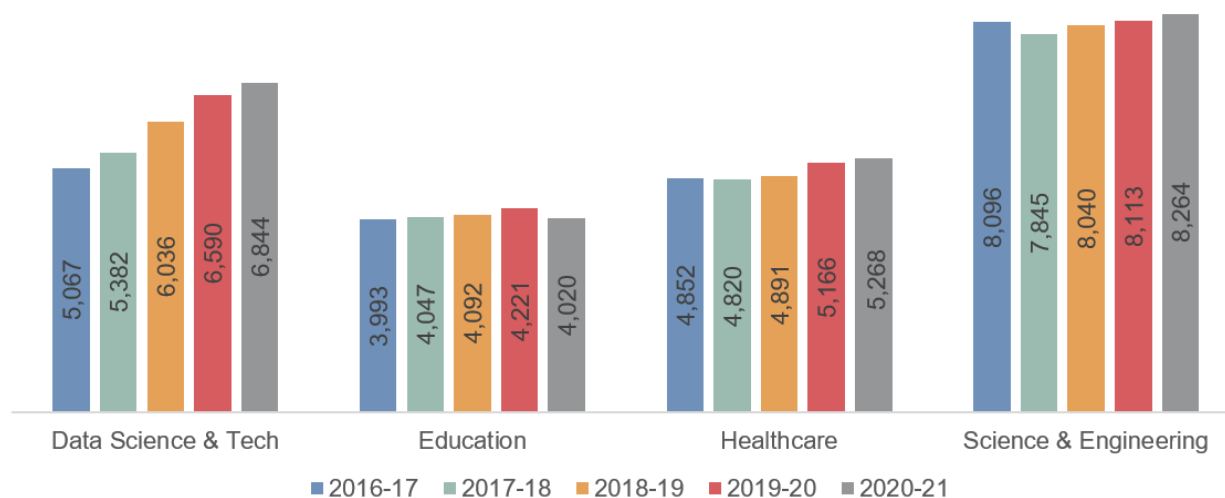
Area (2-Digit CIP)	2017	2018	2019	2020	2021
Data Science & Tech (11,14,27,52)	5,067	5,382	6,036	6,590	6,844
Education (13)	3,993	4,047	4,092	4,221	4,020
Science & Engineering (14*)	8,096	7,845	8,040	8,113	8,264
Health (51)	4,852	4,820	4,891	5,166	5,268
Total	22,008	22,094	23,059	24,090	24,396

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

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The primary growth was in the data science and technology awards (75% growth since 2017) followed by healthcare (17% growth since 2017). Education and Science & Engineering awards grew minimally in the same time period. Chart 1 illustrates the annual growth by award area.

Chart 1: Annual awards by Area



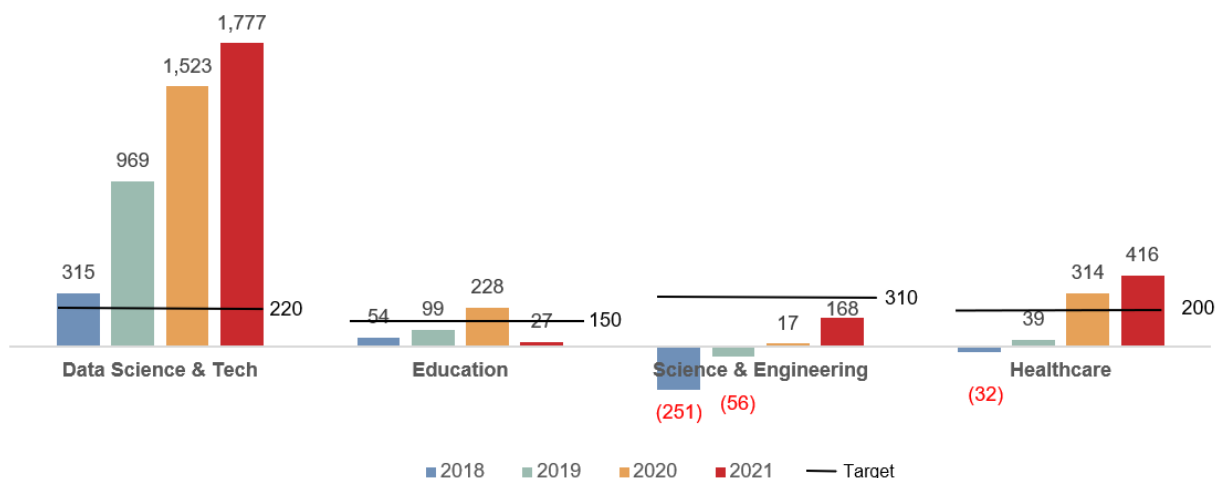
As noted in budget language, institutions were asked to increase their total award production by 880 by 2020. Table 2 provides the expected increase over the baseline year and the actual annual increase 2020 and 2021. Chart 2 illustrates the comparison and notes that the overall target for science & engineering was not met in 2020 and in 2021 and education was not met in 2021.

Table 2: Annual Award Change Over Base Year 2017 Compared to Expected Annual Growth

Area (2-Digit CIP)	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
Data Science & Tech (11,14,27,52)	220	315	969	1,523	1,777
Education (13)	150	54	99	228	27
Science & Engineering (14*)	310	(251)	(56)	17	168
Health (51)	200	(32)	39	314	416
Total	880	86	1,051	2,082	2,388

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

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



Awards by Institution

Nearly all institutions increased their awards from 2017 to 2021. Two institutions did not increase, NSU and VSU; however both of these institutions had sharp declines in [enrollments](#) from 2013 to 2015 which impacts awards in the subsequent four to five year time frame. At NSU fall enrollments declined 920 students (15%) from 2014 to 2015. At VSU fall enrollments declined by 1,067 students (19%) from 2013 to 2015. A [report](#) on the impact of changes in federal Parental Loans for Undergraduate Students (PLUS) indicated that HBCUs were disproportionately impacted and experienced larger declines compared to other students. As a note, ODU also had a slight decline in enrollments

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during a similar timeframe. Given the higher percentage of low-income students, the changes to the PLUS loans also may have impacted ODU and contributed to the lower awards in these areas in later years.

Conversely, in some institutions grew in a similar time period. GMU increased enrollments between fall 2014 to 2016 by nearly 1,400 students and VT increased students by 1,946 students.

Table 3: Total Awards by Institution, 2017 to 2021

Inst.	2017	2018	2019	2020	2021
CNU	396	379	405	385	427
GMU	3,698	3,913	4,148	4,369	4,628
JMU	1,973	2,018	2,019	2,170	2,247
LU	322	342	326	323	334
NSU	385	346	257	277	256
ODU	3,060	2,983	2,900	2,879	2,892
RU	700	678	745	1,028	987
UMW	357	327	356	424	390
UVA	2,589	2,690	3,042	3,212	3,023
VCU	3,110	3,043	3,215	3,190	3,220
VMI	183	226	183	180	203
VSU	308	287	266	264	246
VT	4,158	4,064	4,443	4,585	4,757
W&M	769	798	754	804	786
Total	22,008	22,094	23,059	24,090	24,396

As shown in table 4, with the decline in overall awards, NSU, ODU and VSU did not meet the annual expected increase. In addition, CNU, VMI, VCU did not meet the expected increase in 2020 awards, but exceeded or met the goal with the 2021 awards. W&M increased awards, but did not meet the goal in 2020 and in 2021.

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

Inst.	Expected Total Annual Increases	2018 Annual Change over 2017	2019 Annual Change over 2017	2020 Annual Change over 2017	2021 Annual Change over 2017
CNU	20	(17)	9	(11)	31
GMU	160	215	450	671	930
JMU	85	45	46	197	274
LU	15	20	4	1	12
NSU	20	(39)	(128)	(108)	(129)
ODU	125	(77)	(160)	(181)	(168)
RU	30	(22)	45	328	287
UMW	10	(30)	(1)	67	33
UVA	80	101	453	623	434
VCU	110	(67)	105	80	110
VMI	10	43	0	(3)	20
VSU	15	(21)	(42)	(44)	(62)
VT	160	(94)	285	427	599
W&M	40	29	(15)	35	17
Total	880	86	1,051	2,082	2,388

The remaining tables provide awards by area and changes in awards from 2017 to 2021. Table 5 shows the annual degree awards by area and Table 6 shows the expected annual degree increase and the actual annual degree change. 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.

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Table 5 Annual Awards by Area

Inst.	Data Science & Tech							Science & Engineering*							Education							Health					Total
	2017	2018	2019	2020	2021	Total	2017	2018	2019	2020	2021	Total	2017	2018	2019	2020	2021	Total	2017	2018	2019	2020	2021	Total			
CNU	107	109	129	130	147	622	219	193	216	203	231	1,062	70	77	60	52	49	308							1,992		
GMU	1,313	1,434	1,527	1,683	1,876	7,833	778	824	869	827	868	4,166	907	954	1,026	1,115	1,053	5,055	700	701	726	744	831	3,702	20,756		
JMU	297	312	317	365	359	1,650	375	365	357	377	429	1,903	325	362	334	386	372	1,779	976	979	1,011	1,042	1,087	5,095	10,427		
LU	26	29	29	30	19	133	73	61	68	65	42	309	111	137	86	116	167	617	112	115	143	112	106	588	1,647		
NSU	85	82	59	77	65	368	126	102	58	84	96	466	71	70	69	43	36	289	103	92	71	73	59	398	1,521		
ODU	382	420	442	477	514	2,235	966	936	953	947	915	4,717	708	663	615	602	608	3,196	1,004	964	890	853	855	4,566	14,714		
RU	93	92	108	69	82	444	133	112	134	143	114	636	286	264	285	294	276	1,405	188	210	218	522	515	1,653	4,138		
UMW	74	69	90	92	75	400	141	122	120	147	154	684	120	106	106	133	113	578	22	30	40	52	48	192	1,854		
UVA	572	590	956	1,203	1,044	4,365	1,195	1,208	1,158	1,089	1,131	5,781	314	358	404	388	309	1,773	508	534	524	532	539	2,637	14,556		
VCU	454	456	441	464	476	2,291	900	876	916	921	940	4,553	559	552	655	652	659	3,077	1,197	1,159	1,203	1,153	1,145	5,857	15,778		
VMI	38	64	55	50	58	265	145	162	128	130	145	710													975		
VSU	79	76	60	70	75	360	113	96	121	118	115	563	116	115	85	76	56	448							1,371		
VT	1,320	1,400	1,592	1,608	1,774	7,694	2,535	2,414	2,580	2,704	2,718	12,951	261	214	206	190	182	1,053	42	36	65	83	83	309	22,007		
WM	227	249	231	272	280	1,259	397	374	362	358	366	1,857	145	175	161	174	140	795							3,911		
Total	5,067	5,382	6,036	6,590	6,844	29,919	8,096	7,845	8,040	8,113	8,264	40,358	3,993	4,047	4,092	4,221	4,020	20,373	4,852	4,820	4,891	5,166	5,268	24,997	115,647		

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

Table 6 Annual Change in Awards over 2017 Base Year

Inst.	Expected Annual Awards	Data Science & Tech					Expected Annual Awards	Science & Engineering*					Expected Annual Awards	Education					Expected Annual Awards	Health					Expected Annual Awards	Total Annual Change				
		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		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		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		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		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	15	(26)	(3)	(16)	12	40	7	(10)	(18)	(21)	35	1	26	44	131	160	(17)	9	(11)	31					
GMU	50	121	214	370	563	35	46	91	49	90	40	47	119	208	146	35	26	44	131	160	215	450	671	930						
JMU	10	15	20	68	62	15	(10)	(18)	2	54	15	37	9	61	47	3	35	66	111	85	45	46	197	274						
LU		3	3	4	(7)	5	(12)	(5)	(8)	(31)	5	26	(25)	5	56	5	3	31	0	(6)	15	20	4	1	12					
NSU	5	(3)	(26)	(8)	(20)	5	(24)	(68)	(42)	(30)	5	(1)	(2)	(28)	(35)	5	(11)	(32)	(30)	(44)	20	(39)	(128)	(108)	(129)					
ODU	15	38	60	95	132	40	(30)	(13)	(19)	(51)	30	(45)	(93)	(106)	(100)	40	(40)	(114)	(151)	(149)	125	(77)	(160)	(181)	(168)					
RU	5	(1)	15	(24)	(11)	5	(21)	1	10	(19)	10	(22)	(1)	8	(10)	10	22	30	334	327	30	(22)	45	328	287					
UMW		(5)	16	18	1	5	(19)	(21)	6	13	5	(14)	(14)	13	(7)		8	18	30	26	10	(30)	(1)	67	33					
UVA	20	18	384	631	472	30	13	(37)	(106)	(64)	10	44	90	74	(5)	20	26	16	24	31	80	101	453	623	434					
VCU	20	2	(13)	10	22	30	(24)	16	21	40	20	(7)	96	93	100	40	(38)	6	(44)	(52)	110	(67)	105	80	110					
VMI	5	26	17	12	20	5	17	(17)	(15)	0											10	43	0	(3)	20					
VSU	5	(3)	(19)	(9)	(4)	5	(17)	8	5	2	5	(1)	(31)	(40)	(60)						15	(21)	(42)	(44)	(62)					
VT	60	80	272	288	454	100	(121)	45	169	183		(47)	(55)	(71)	(79)		(6)	23	41	41	160	(94)	285	427	599					
WM	20	22	4	45	53	15	(23)	(35)	(39)	(31)	5	30	16	29	(5)					40	29	(15)	35	17						
Total	220	315	969	1,523	1,777	310	(251)	(56)	17	168	150	54	99	228	27	200	(32)	39	314	416	880	86	1,051	2,082	2,388					

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