

Legislative Report

Senior Year Plus STEM



January 15, 2018

State Board of Education

State of Iowa
Department of Education
Grimes State Office Building
400 E. 14th Street
Des Moines, IA 50319-0146

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LEGISLATIVE REQUIREMENT - IOWA CODE 261E.3 J

All eligible postsecondary institutions providing programming under this chapter shall include the unique student identifier assigned to students while in the kindergarten through grade twelve system as a part of the institution's student data management system. Eligible postsecondary institutions providing programming under this chapter shall cooperate with the department on data requests related to the programming. All eligible postsecondary institutions providing programming under this chapter shall collect data and report to the department on the proportion of females and minorities enrolled in science, technology, engineering, and mathematics-oriented educational opportunities provided in accordance with this chapter. The department shall submit the programming data and the department's findings and recommendations in a report to the general assembly annually by January 15.

ADVANCED PLACEMENT ENROLLMENT IN STEM

ADVANCED PLACEMENT COURSE ENROLLMENT BY RACE/ETHNICITY

Race/Ethnicity	2014-15				2015-16				2016-17			
	Number of Courses	Percent*	Number of STEM	Percent	Number of Courses	Percent*	Number of STEM	Percent	Number of Courses	Percent*	Number of STEM	Percent
Asian	870	5.6%	341	7.4%	939	5.7%	404	8.1%	979	5.8%	381	7.5%
Black	707	4.5%	134	2.9%	722	4.4%	159	3.2%	777	4.6%	169	3.3%
Hispanic	1,212	7.7%	245	5.3%	1,348	8.2%	270	5.4%	1,456	8.6%	306	6.0%
Multi-racial	475	3.0%	111	2.4%	573	3.5%	162	3.3%	561	3.3%	148	2.9%
Native American	42	0.3%	12	0.3%	33	0.2%	10	0.2%	29	0.2%	10	0.2%
Pacific Islander	18	0.1%	3	0.1%	19	0.1%	4	0.1%	17	0.1%	4	0.1%
White	12,329	78.8%	3,774	81.7%	12,871	78.0%	3,979	79.8%	13,105	77.4%	4,048	79.9%
Total	15,653	100.0%	4,620	100.1%	16,505	100.1%	4,988	100.1%	16,924	100.0%	5,066	100.0%

Source: Iowa Department of Education, Student Reporting in Iowa collection

* May not equal 100% due to rounding

ADVANCED PLACEMENT COURSE ENROLLMENT BY GENDER

Gender	2014-15				2015-16				2016-17			
	Number of Courses	Percent*	Number of STEM	Percent	Number of Courses	Percent*	Number of STEM	Percent	Number of Courses	Percent*	Number of STEM	Percent
Female	8,559	54.7%	2,089	45.2%	9,003	54.6%	2,248	45.1%	9,318	55.1%	2,326	45.9%
Male	7,094	45.3%	2,531	54.8%	7,502	45.5%	2,740	54.9%	7,606	44.9%	2,740	54.1%
Total	15,653	100.0%	4,620	100.0%	16,505	100.1%	4,988	100.0%	16,924	100.0%	5,066	100.0%

Source: Iowa Department of Education, Student Reporting in Iowa collection

* May not equal 100% due to rounding

CONCURRENT ENROLLMENT IN STEM

CONCURRENT COURSE ENROLLMENT BY RACE/ETHNICITY

Race/Ethnicity	2014-15				2015-16				2016-17			
	Number of Courses	Percent*	Number of STEM	Percent	Number of Courses	Percent*	Number of STEM	Percent	Number of Courses	Percent*	Number of STEM	Percent
Asian	1,118	2.7%	571	3.7%	1,219	2.8%	564	3.7%	1,366	3.1%	695	4.3%
Black	1,089	2.7%	497	3.2%	1,224	2.8%	455	3.0%	1,308	2.9%	524	3.2%
Hispanic	2,985	7.3%	1,265	8.2%	3,154	7.3%	1,329	8.7%	3,453	7.7%	1,445	8.9%
Multi-racial	837	2.1%	344	2.2%	981	2.3%	351	2.3%	1,068	2.4%	440	2.7%
Native American	128	0.3%	48	0.3%	116	0.3%	47	0.3%	117	0.3%	49	0.3%
Pacific Islander	45	0.1%	15	0.1%	39	0.1%	14	0.1%	60	0.1%	19	0.1%
White	34,722	84.9%	12,741	82.3%	36,324	84.4%	12,543	82.0%	37,294	83.5%	13,155	80.6%
Total	40,924	100.1%	15,481	100.0%	43,057	100.0%	15,303	100.1%	44,666	100.0%	16,327	100.1%

Source: Iowa Department of Education, Student Reporting in Iowa collection

* May not equal 100% due to rounding

CONCURRENT COURSE ENROLLMENT BY GENDER

Gender	2014-15				2015-16				2016-17			
	Number of Courses	Percent*	Number of STEM	Percent	Number of Courses	Percent*	Number of STEM	Percent	Number of Courses	Percent*	Number of STEM	Percent
Female	19,831	48.5%	6,558	42.4%	21,155	49.1%	6,593	43.1%	22,172	49.6%	7,253	44.4%
Male	21,093	51.5%	8,923	57.6%	21,902	50.9%	8,710	56.9%	22,494	50.4%	9,074	55.6%
Total	40,924	100.0%	15,481	100.0%	43,057	100.0%	15,303	100.0%	44,666	100.0%	16,327	100.0%

Source: Iowa Department of Education, Student Reporting in Iowa collection

* May not equal 100% due to rounding

POSTSECONDARY ENROLLMENT OPTIONS ENROLLMENT IN STEM

POSTSECONDARY COURSE ENROLLMENT BY RACE/ETHNICITY

Race/Ethnicity	2014-15				2015-16				2016-17			
	Number of Courses	Percent*	Number of STEM	Percent	Number of Courses	Percent*	Number of STEM	Percent	Number of Courses	Percent*	Number of STEM	Percent
Asian	105	2.2%	46	4.2%	113	2.3%	62	5.2%	156	3.0%	74	6.0%
Black	27	0.6%	4	0.4%	29	0.6%	4	0.3%	45	0.9%	11	0.9%
Hispanic	132	2.8%	38	3.4%	148	3.0%	19	1.6%	182	3.5%	32	2.6%
Multi-racial	67	1.4%	16	1.4%	72	1.4%	23	1.9%	80	1.6%	25	2.0%
Native American	12	0.3%	2	0.2%	10	0.2%	-	0.0%	7	0.1%	2	0.2%
Pacific Islander	4	0.1%	2	0.2%	4	0.1%	1	0.1%	2	0.0%	1	0.1%
White	4,380	92.7%	1,001	90.3%	4,639	92.5%	1,090	90.9%	4,669	90.8%	1,082	88.2%
Total	4,727	100.1%	1,109	100.1%	5,015	100.1%	1,199	100.0%	5,141	100.0%	1,227	100.0%

Source: Iowa Department of Education, Student Reporting in Iowa collection

* May not equal 100% due to rounding

POSTSECONDARY COURSE ENROLLMENT

Gender	2014-15				2015-16				2016-17			
	Number of Courses	Percent*	Number of STEM	Percent	Number of Courses	Percent*	Number of STEM	Percent	Number of Courses	Percent*	Number of STEM	Percent
Female	2,893	61.2%	575	51.9%	3,114	62.1%	652	54.4%	3,234	62.9%	696	56.7%
Male	1,834	38.8%	534	48.2%	1,901	37.9%	547	45.6%	1,907	37.1%	531	43.3%
Total	4,727	100.0%	1,109	100.1%	5,015	100.0%	1,199	100.0%	5,141	100.0%	1,227	100.0%

Source: Iowa Department of Education, Student Reporting in Iowa collection

* May not equal 100% due to rounding

2016-17 K-12 ENROLLMENT BY GENDER

Gender	Count	Percent
Female	233,463	48.5%
Male	248,125	51.5%

2016-17 K-12 ENROLLMENT BY RACE/ETHNICITY

Race/Ethnicity	Student Count	Percent
African American/Black	28,812	6.0%
American Indian	1,810	0.4%
Asian	11,866	2.5%
Hawaiian/Pacific Islander	1,175	0.2%
Hispanic	51,380	10.7%
Multi-race	18,033	3.7%
White	368,512	76.5%

FINDINGS AND RECOMMENDATIONS

Findings

Data contained in this report shows an increase in the overall enrollment trends for all Senior Year Plus areas, including Advance Placement (AP), Concurrent Enrollment, and Postsecondary Enrollment Options (PSEO). In addition, between the 2014-15 and 2016-17 school years, there were increases in STEM courses taken across all Senior Year Plus areas. This suggests a statewide overall increase in STEM courses in advanced and college level course work in Iowa school districts.

This report provides information about enrollment patterns of students by gender and race/ethnicity in Senior Year Plus opportunities. Overall, there was an increase in female enrollment in Senior Year Plus STEM opportunities between 2014-15 and 2016-17. This trend held across all types of Senior Year Plus course work including Advanced Placement, Concurrent Enrollment and PSEO.

Increases in the percent of students enrolled in Senior Year Plus STEM courses can be found across several minority groups between 2014-15 and 2016-17. In Advanced Placement STEM courses, there are increases for Asian, Black, Hispanic and Multi-racial student groups. Increases can be also found in Concurrent Enrollment STEM courses for Asian, Hispanic and Multi-racial student groups. There was no change in the enrollment of Black students between 2014-15 and 2016-17 in Concurrent Enrollment STEM courses. During this same time frame, increases can be found for Asian, Black and Multi-racial students in PSEO STEM courses. Lastly, there was a slight decline in PSEO STEM enrollment for Hispanic students.

Recommendations

In July 2011, Governor Branstad signed Executive Order 74 creating the Iowa Governor's STEM Advisory Council. The STEM Council focuses on enhancing the Iowa's PK-12 talent pipeline which will result in increased interest in a STEM career. While this report cannot determine if there is a causal relationship between the focus on STEM, it is interesting that there is an increase in advanced STEM course-taking patterns with this increased focus on STEM statewide.

Notable differences can be found when examining the enrollment patterns in Senior Year Plus STEM programming for different race/ethnicity student groups and between female and male students. The Senior Year Plus program includes rigorous opportunities for students as they complete secondary education and prepare for success beyond high school. Increases can be found in female enrollment in rigorous STEM opportunities. In addition, increases can be found in key race/ethnic student groups in STEM. Iowa districts should examine enrollment patterns by gender and race/ethnicity to ensure access to and equitable participation in Senior Year Plus STEM opportunities.

In November 2017, the Iowa Department of Education released the Computer Science Education Work Group report. The report includes recommendations in five key areas: 1) computer science graduation requirements; 2) integration of high-quality computer science

course work into career and technical (CTE) pathways; 3) options for computer science course delivery; 4) guidelines for computer science instruction at each grade level; and 5) use of computer science professional development funding. The recommendations in the Computer Science report provide a path forward as Iowa considers further policies to strengthen computer science education for Iowa students. The Computer Science Work Group recommendations are an important example of Iowa's focus on expanding options for students in STEM opportunities.