Promising Practices to Support the Development of K–12 Manufacturing Programs: Spotlight on Colchester Public Schools' Bacon Academy Data

Background

The Manufacturing Skills for Connecticut (MSforCT) project, funded by the U.S. Department of Commerce National Institute for Standards and Technology, aimed to establish a menu of effective educational best practices that Manufacturing Extension Partnerships (MEPs) throughout the country, and manufacturers and school systems across CT and beyond, can use to establish and advance effective career pathways. CONNSTEP, CT's MEP representative, was the lead organization partnering with ReadyCT, a statewide nonprofit focused on K–12 education and career-connected learning; CBIA, CT's largest business organization; the Connecticut Manufacturers' Collaborative, a statewide, policy-focused collective composed of the nine major manufacturing associations within CT; and WestEd, a non-partisan research, development, and service agency.

As part of the MSforCT project, WestEd executed a multistep process to identify 13 manufacturing programs with evidence of using promising practices intended to support high-quality programming. This process included developing a statewide survey; identifying all existing manufacturing programs across CT for survey administration; developing and using a rubric to rank manufacturing programs on their use of high-quality, high-impact practices; and considering site demographics and industry recommendations to choose the final 13 program sites. WestEd then conducted 13 program reviews which included interviews/focus groups with key program stakeholders and a review of student administrative data. Ultimately, the MSforCT project created numerous resources including The MFG Skills-CT website, a Promising Practices guide, and 13 program-specific reports, including Colchester Public Schools' Bacon Academy manufacturing program.

Bacon Academy Manufacturing Program Data

The current summary of Bacon Academy's manufacturing program data supplements the site-specific report. This document summarizes data from CT's Statewide Longitudinal Data System (SLDS): the Preschool Through 20 Workforce Information Network (P20 WIN). The data included all students enrolled in the high school during the 2016-2017 and 2020-21 academic years. Manufacturing program students in Bacon Academy are defined as students who finished both manufacturing program courses. Manufacturing students are included in the overall school population.

Table 1: Student Demographics, Academic Year 2020-2021

Student Characteristics	Manufacturing Program Students (n = 30)		Overall School Population (n = 715)	
	n	%	n	%
American Indian or Alaska Native	*	*	*	*
Asian	*	*	18	3%
Black or African American	*	*	13	2%
Hispanic/Latino of any race		*	58	8%
Native Hawaiian or Other Pacific Islander	*	*	*	*
Two or More Races	*	*	40	6%
White	25	83%	586	82%
Female	5	17%	354	50%
English Language Learners	*	*	*	*
Students with Disabilities	*	*	67	9%
Free/Reduced Lunch Eligible	7	23%	159	22%

Note: Cells with five or fewer students are restricted from reporting and noted with an asterisk.

The manufacturing program enrolled 30 students at Bacon Academy in the academic year 2020-2021. Of those students, 83% were White, which was close to their overall enrollment rate for that academic year (82%). Because of the small number of students representing other racial/ethnic groups, those groups are not reported in the data set. Female students represented 50% of the overall school population, but represented 17%. the manufacturing cohort.

Table 2: Student Demographics, Academic Years 2016-2017 & 2020-2021

Student Characteristics	Manufacturing Program Students (n = 42)		Overall School Population (n = 1,509)	
	n	%	n	%
American Indian or Alaska Native	*	*	5	0%
Asian	*	*	31	2%
Black or African American	*	*	38	3%

Hispanic/Latino of any race	*	*	95	7%
Native Hawaiian or Other Pacific Islander	*	*	*	*
Two or More Races	*	*	48	3%
White	35	83%	1,292	85%
Female	8	19%	768	51%
English Language Learners	*	*	*	*
Students with Disabilities	6	14%	161	11%
Free/Reduced Lunch Eligible	12	28%	281	19%

Note: Cells with five or fewer students are restricted from reporting and noted with an asterisk.

The manufacturing program enrolled 30 students at Bacon Academy in the academic years 2016-17 and 2020-2021. As in the 83% of the manufacturing cohort members were White students and the other groups were not reported due to small numbers. The female students' low comparative rate of participation (19%) in the program was observed across these two academic years as well.

Table 3: Academic Characteristics, Academic Years 2016-2017 & 2020-2021

Metric	**Manufacturing Program Students (n = 42)**					**Overall School Population (n = 1,514)**				
	Mean	Median	SD	High	Low	Mean	Median	SD	High	Low
Attendance	168.9	172	11.3	181	115	169.8	174	16.0	181	11

Note: Attendance is defined at the total number of days attended in a given school year.

Manufacturing students across cohorts (2016-17 and 2020-21) attended school on average 168.9 days (SD 11.3). This figure is similar to the average overall school attendance.

Table 4: Standardized Assessment, Academic Years 2016-2017 & 2020-2021

Metric	**Manufacturing Program Students (n = 19)**					**Overall School Population (n = 923)**				
	Mean	Median	SD	High	Low	Mean	Median	SD	High	Low
English SAT	481.6	480	77.9	670	330	537.0	540	91.9	790	280
Math SAT	467.4	460	96.3	620	200	517.0	520	95.1	790	200

Of the 19 manufacturing students who took the SAT, the average schores were were 481.6 (SD 77.9) on the English section and 467.4 (SD 96.3) on the math section. On average, the manufacturing program students' English and math scores were lower than the overall school population's average scores.

Table 5: Secondary Graduation Rate, Academic Years 2016-2017 & 2020-2021

Metric	Manufacturing Program Students		Overall School Population	
	n	%	n	%
Graduated in 2017	11	92%	754	94%
Graduated in 2021	10	100%	179	95%

In the 2016-17 academic year, 11 (or 92%) manufacturing students graduated from Bacon Academy. The school-wide graduation rate for that year was slightly higher at 94%. In the 2020-21 academic year, all 10 manufacturing cohort members who were seniors graduated from high school.

Table 6: Postsecondary Enrollment, Academic Years 2016-2017

	Manufacturing Students		Overall School Population	
	n=11	%	n=754	%
Enrolled in CT Postsecondary Program	6	55%	353	47%
Enrolled in Out of State Postsecondary Program	*	*	252	33%
No Record of Postsecondary Enrollment	*	*	149	20%

Note: Cells with five or fewer students are restricted from reporting and noted with an asterisk.

In total, 6 students from the manufacturing program entered postsecondary educational institutions in Connecticut. The other data in the table were not reported due to small numbers. For the overall school student population, 47% of the students who graduated from high school entered postsecondary programs in Connecticut; 33% in out-of-state institutions.

Table 7: Postsecondary Enrollment, By Institution Type, Academic Years 2016-2017

Institution Type	Overall School Population	
	n=605	%
Overall		
4-Year Institution	457	75.4%
2-Year Institution	148	24.4%
<2-Year Institution	*	*

Note: Cells with five or fewer students are restricted from reporting and noted with an asterisk.

* There was not enough data to report the enrollment rates across given types of institutions for manufacturing cohort students.

In the overall school population, 75% of students in postsecondary education were in 4-year programs and 24% in 2-year colleges. The numbers for manufacturing cohort students were too small to report.

Table 8: Postsecondary Persistence – Y1 – Y2, Academic Year 2016-2017

	Manufacturing Students		School Population	
	n=8	%	n=605	%
Persistence	5	62.5%	395	65.2%

Persistence in postsecondary education was defined as an individual being enrolled in a postsecondary institution in the same year they graduated from high school and being enrolled in two consecutive fall terms in the institution. Of the eight students from manufacturing cohorts who were enrolled in postsecondary institutions, five met the persistence criteria (62.5%). In overall school population, the persistence rate was 65.2%. The sample size for the manufacturing cohort was too small for comparison.

Table 9: Postsecondary Graduation Rate, Measured from Time of Enrollment, Academic Years 2016-2017

Graduation Rate	School Population	
	n=605	%
Overall		
4-Year Institution	99	21.6%
2-Year Institution	8	5.4%
<2-Year Institution	*	*

Note: There was not enough data to calculate and report the graduation rates for manufacturing cohort students.

At the time of the data collection, 99 students had graduated from 4-year programs (22% of all enrolled in 4-year institutions) from Bacon's overall school population.