SECTION FIVE

How Prepared are the Commonwealth's Vocational Schools to Meet Future Labor Market Demand?

The Dukakis Center surveyed administrators at Massachusetts vocational technical high schools to elicit their opinions on trends in vocational technical education and future employment demand in the Commonwealth. The objective was to assess whether these administrators have a reasonably good idea of what programs they might like to expand to meet future occupational demand, which programs should be continued at current levels, and which might be phased down or out.

An online survey was administered to the superintendents, principals, and career and technical education (CTE) directors at the 26 regional vocational technical schools, 28 comprehensive/city vocational technical schools, the three agricultural vocational schools, and the two independent/collaborative vocational schools. The size of the survey population was 106 superintendents, principals, and CTE directors. David Ferreira, Executive Director of the Massachusetts Association of Vocational Administrators assisted with disseminating the survey and sending email reminders during the survey period. Reminder phone calls were placed to the administrators by Dukakis Center staff. A total of 74 administrators responded to the survey resulting in a response rate of 70 percent.

Number of Survey Respondents Among the Types of
Career and Technical Education Schools

TABLE 7

Category of School	Number of Respondents	Percentage of Respondents
Regional Vocational School	55	74.3%
Comprehensive High School	9	12.2%
City Vocational School	6	8.1%
Agricultural Vocational School	3	4.1%
Independent/Collaborative Vocational School	1	1.4%
TOTAL	74	100%

The number of respondents and distribution of respondents by type of school is found in **Table 7**.

Nearly three-quarters of the respondents were administrators at regional vocational schools with another 12 percent at comprehensive high schools offering vocational programs.

SOURCE: Dukakis Center Survey of Public High School Administrators

SECTION 5, TABLE 8

Survey Results - Curriculum Changes Under Current Funding

One of the first survey questions asked school administrators concerned what sources of information they use to gauge future labor demand which might affect future curriculum offerings at their schools. As **Table 8** reveals, by far, the factors rated "very important" were "projected industry growth" followed by "projected need for replacement for retiring workers." Administrators also consider student demand in their calculations along with input from school advisory committees. These results suggest that vocational school administrators are keenly aware of expected changes in the labor market and seem prepared to respond to occupational need.

A second set of questions asked administrators what programs they would expect to expand enrollment, maintain enrollment, or reduce enrollment – assuming current funding levels. These questions were asked for each Occupational Cluster.

TABLE 8

Factors Vocational School Administrators Consider in Projecting Future Demand for Workers by Occupation and Training Program

Factors	Very Important	Important	Not Very Important	Not at all Important	Do Not Use
Projected industry growth	81.8%	18.2%	0.0%	0.0%	0.0%
Projected need for replacement of retiring workers	56.3%	40.6%	3.1%	0.0%	0.0%
Changes in student demand for specific programs	44.6%	52.3%	3.1%	0.0%	0.0%
Response to potential public-private partnerships with industry	40.9%	50.0%	9.1%	0.0%	0.0%
Response to input from school advisory committee	36.9%	58.5%	4.6%	0.0%	0.0%
Projected changes in occupational wages	32.3%	60.0%	7.7%	0.0%	0.0%
Response to existence of similar programs in your region	16.9%	63.1%	16.9%	1.5%	1.5%
Response to existence of similar programs in an adjacent region	12.3%	47.7%	38.5%	1.5%	0.0%
Response to need for greater gender balance across programs	9.1%	60.6%	22.7%	4.5%	3.0%

Natural Resources Occupation Cluster

Table 9 shows responses related to the Agricultural and Natural Resources Occupational Cluster. Of the 21 respondents hosting a Horticultural training program, 16 would expect to maintain enrollment, five would expect to expand it, and none would expect to reduce enrollment or eliminate the program under current funding. Of those not currently offering the program, only three of 53 would expect to add it at their schools. However, a larger number expect to increase enrollments in Environmental Science & Technology and ten respondents expect to add this program at their schools.

Animal Science also seems to garner support for expanded enrollment. All three respondents who rated Agricultural Mechanics expect to expand or maintain their programs.

TABLE 9

Expected Changes in Enrollment and Programming Over the Next 10 Years
Assuming Current Funding Levels: Natural Resources Occupation Cluster

Program	Number of Respondents Offering Program	In the next 10 years, the number of respondents who expect to...				Number of Respondents Not Offering Program	In the next 10 years, the number of respondents that have plans to add to the program.	
		Expand Enrollment	Maintain Enrollment	Reduce Enrollment	Eliminate the Program		Have Plans to Add	Do Not Have Plans to Add
Horticulture	21	5	16	0	0	53*	3	49
Environmental Science & Technology	17	9	7	1	0	57*	10	46
Animal Science	4	4	0	0	0	70	11	59
Agricultural Mechanics	3	1	2	0	0	71	4	67

* One or more respondents did not answer the question regarding plans to add to the program.

Arts & Communications Occupation Cluster

Table 10 (*see next page*) provides the same information for the Arts and Communications Cluster. Of the 50 respondents from schools offering Graphic Communications, 34 expect to maintain enrollment, but nine expect to expand it. Only seven expect to reduce enrollments or eliminate the program. No respondents in schools currently not offering Graphic Communications expect to expand enrollment over the next ten years.

There is a higher expecation about expanding enrollment in Design & Visual Communications. Here, nearly a third of respondents (15/46) expect to expand enrollment and no one expects to reduce enrollment or eliminate the program. Moreover, of the 23 respondents in schools not currently offering this program, nine expect to add it.

In Radio and Television Broadcasting, more than half (7/13) of those responding expect to expand enrollment in this field and 13 of those without the program are planning to add it sometime over the next ten years.

SECTION 5, TABLES 10-11

TABLE 10

**Expected Changes in Enrollment and Programming Over the Next 10 Years
Assuming Current Funding Levels: Arts & Communications Occupation Cluster**

Program	Number of Respondents Offering Program	In the next 10 years, the number of respondents who expect to...				Number of Respondents Not Offering Program	In the next 10 years, the number of respondents that have plans to add to the program.	
		Expand Enrollment	Maintain Enrollment	Reduce Enrollment	Eliminate the Program		Have Plans to Add	Do Not Have Plans to Add
Graphic Communications	50	9	34	3	4	24*	0	23
Design & Visual Communications	46	15	31	0	0	28	9	19
Radio & Television Broadcasting	13	7	6	0	0	61	13	48

* One or more respondents did not answer the question regarding plans to add to the program.

Business & Consumer Services Occupation Cluster

Table 11 contains the same information for the Business & Consumer Services Occupational Cluster. More than a quarter (14/48) of respondents expect to expand their Cosmetology enrollments and two respondents expect to add this program to their school's curriculum.

Even more respondents (12/28) expect to expand their Office Technology programs and four expect to add it.

Marketing is seen as a growing field with three-quarters of respondents (9/12) expecting to increase enrollments and six respondents expect to add it at their schools.

Fashion Technology may also see some expansion in two of the six schools offering it and three more respondents expect to see this curriculum added to their schools.

TABLE 11

**Expected Changes in Enrollment and Programming Over the Next 10 Years
Assuming Current Funding Levels: Business & Consumer Services Occupation Cluster**

Program	Number of Respondents Offering Program	In the next 10 years, the number of respondents who expect to...				Number of Respondents Not Offering Program	In the next 10 years, the number of respondents that have plans to add to the program.	
		Expand Enrollment	Maintain Enrollment	Reduce Enrollment	Eliminate the Program		Have Plans to Add	Do Not Have Plans to Add
Cosmetology	63	14	48	0	1	11	2	9
Office Technology	43	12	28	0	3	30	4	25
Marketing	27*	9	12	2	3	46	6	39
Fashion Technology	6	2	3	1	0	68	3	64

* One or more respondents did not answer the question regarding enrollment.

Construction Occupation Cluster

In line with the high job replacement needs in Construction, **Table 12** reveals that a large number of respondents expect to expand their programs in Carpentry, Electricity, HVAC, Plumbing, Sheet Metalworking, and Cabinet Making. There are a small number of schools that have plans to add programs in a number of these fields.

TABLE 12

Expected Changes in Enrollment and Programming Over the Next 10 Years
Assuming Current Funding Levels: Construction Occupation Cluster

| Program | Number of Respondents Offering Program | In the next 10 years, the number of respondents who expect to... | | | | Number of Respondents Not Offering Program | In the next 10 years, the number of respondents that have plans to add to the program. | |
		Expand Enrollment	Maintain Enrollment	Reduce Enrollment	Eliminate the Program		Have Plans to Add	Do Not Have Plans to Add
Carpentry	70	22	48	0	0	2	0	2
Electricity	64	16	48	0	0	7	2	5
Heating, Ventilation, Air Conditioning, Refrigeration	45	14	29	1	1	26	5	21
Plumbing	43	8	35	0	0	28*	7	20
Sheet Metalworking	29	8	19	1	1	42	3	39
Plumbing Technology/ Plumber	24	5	19	0	0	47*	5	41
Cabinetmaking	20	5	13	0	2	52	2	50
Facilities Management	10	1	6	2	1	61	2	59
Painting & Design Technologies	9	1	7	0	1	62	2	60
Masonry & Tile Setting	8	0	8	0	0	63	3	60
Construction Craft Laborer	5	3	2	0	0	67*	5	61

* One or more respondents did not answer the question regarding plans to add to the program.

Education Occupation Cluster

Table 13 suggests that more than half the respondents in schools offering Early Education and Care programs expect to see an expansion in enrollment in their programs. A small number of respondents in schools without such a program plan to add it sometime over the next ten years, assuming current funding levels.

TABLE 13

Expected Changes in Enrollment and Programming Over the Next 10 Years
Assuming Current Funding Levels: Education Occupation Cluster

| Program | Number of Respondents Offering Program | In the next 10 years, the number of respondents who expect to... | | | | Number of Respondents Not Offering Program | In the next 10 years, the number of respondents that have plans to add to the program. | |
		Expand Enrollment	Maintain Enrollment	Reduce Enrollment	Eliminate the Program		Have Plans to Add	Do Not Have Plans to Add
Early Education and Care	37	12	23	1	1	34*	3	30

* One or more respondents did not answer the question regarding plans to add to the program.

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SECTION 5, TABLES 14-15

Health Services Occupation Cluster

Not surprising, given the expected growth in the health sciences, a majority (34/65) of respondents with a Health Assisting program expect to expand their enrollments over the next ten years (see **Table 14**). Dental Assisting also appears as a field that will see expanded enrollments with 13 of 30 respondents suggesting this will likely occur in their schools. Seven respondents expect to add it to their school's curriculum. While respondents expect existing programs in Practical Nursing to hold their own with little enrollment expansion, nearly a quarter (11/47) of respondents in schools without such a program expect to add it sometime over the next decade. This is even more true for Medical Assisting programs. Twenty-two of 49 respondents expect to see such a program implemented in their schools. However, there is little current training in Operating Room Technology, no plans to expand the current single program, and only eight out of 70 respondents expect to add such a program

TABLE 14

Expected Changes in Enrollment and Programming Over the Next 10 Years
Assuming Current Funding Levels: Health Services Occupation Cluster

| Program | Number of Respondents Offering Program | In the next 10 years, the number of respondents who expect to... | | | | Number of Respondents Not Offering Program | In the next 10 years, the number of respondents that have plans to add to the program. | |
		Expand Enrollment	Maintain Enrollment	Reduce Enrollment	Eliminate the Program		Have Plans to Add	Do Not Have Plans to Add
Health Assisting	65	34	30	1	0	6	2	4
Dental Assisting	30**	13	16	0	0	41	7	34
Practical Nursing LPN	24	2	22	0	0	47*	11	35
Medical Assisting	22	7	14	0	1	49	22	27
Operating Room Technology	1	0	1	0	0	70	8	62

* One or more respondents did not answer the question regarding plans to add to the program.
**One or more respondents did not answer the question regarding enrollment.

Hospitality & Tourism Occupation Cluster

In accord with the extensive increase in food service jobs and other hospitality industry occupations, 15 respondents in schools with a Culinary Arts program expect to expand their enrollments and none expect to reduce them. Moreover, nearly 30 percent (16/54) of respondents in schools without such a program expect to see their schools add a program in Hospitality Management as shown in **Table 15**.

TABLE 15

Expected Changes in Enrollment and Programming Over the Next 10 Years
Assuming Current Funding Levels: Hospitality & Tourism Occupation Cluster

| Program | Number of Respondents Offering Program | In the next 10 years, the number of respondents who expect to... | | | | Number of Respondents Not Offering Program | In the next 10 years, the number of respondents that have plans to add to the program. | |
		Expand Enrollment	Maintain Enrollment	Reduce Enrollment	Eliminate the Program		Have Plans to Add	Do Not Have Plans to Add
Culinary Arts	68	15	53	0	0	3	1	2
Hospitality Management	17	7	9	0	1	54*	16	37

* One or more respondents did not answer the question regarding plans to add to the program.

Information Technology Occupation Cluster

Respondents also expect to expand enrollment in Information Support Services & Networking and in Programming & Web Development as shown in **Table 16**. Only three respondents thought their schools might reduce enrollment or eliminate the Information Support Services program. A large number of other respondents expect to add these fields to their schools. This is clearly a response to the growth in these industries, especially here in Massachusetts.

Expected Changes in Enrollment and Programming Over the Next 10 Years
Assuming Current Funding Levels: Information Technology Occupation Cluster

TABLE 16

| Program | Number of Respondents Offering Program | In the next 10 years, the number of respondents who expect to... | | | | Number of Respondents Not Offering Program | In the next 10 years, the number of respondents that have plans to add to the program. | |
		Expand Enrollment	Maintain Enrollment	Reduce Enrollment	Eliminate the Program		Have Plans to Add	Do Not Have Plans to Add
Information Support Services & Networking	39	15	21	1	2	31*	7	23
Programming & Web Development	36	13	23	0	0	34	16	18

* One or more respondents did not answer the question regarding plans to add to the program.

Manufacturing, Engineering & Technological Occupation Cluster

Knowing what we now know about the need for replacement workers in manufacturing industries, it is encouraging to see that few respondents expect to reduce enrollment in these programs or eliminate them. Instead, there is strong support for expanding enrollment in Metal Fabrication, Machine Tool Technology, Drafting, Electronics, Biotechnology, and Robotics. Moreover, as **Table 17** reveals, a significant number of respondents expect to add programs, especially in Machine Tool, Engineering Technology, Biotech, and Robotics.

Expected Changes in Enrollment and Programming Over the Next 10 Years
Assuming Current Funding Levels: Manufacturing, Engineering & Technological Occupation Cluster

TABLE 17

| Program | Number of Respondents Offering Program | In the next 10 years, the number of respondents who expect to... | | | | Number of Respondents Not Offering Program | In the next 10 years, the number of respondents that have plans to add to the program. | |
		Expand Enrollment	Maintain Enrollment	Reduce Enrollment	Eliminate the Program		Have Plans to Add	Do Not Have Plans to Add
Metal Fabrication & Joining Technologies	51	14	34	1	2	19	2	17
Machine Tool Technology	42	21	20	0	1	28	11	17
Drafting	42	9	31	0	2	28	7	21
Engineering Technology	33	22	11	0	0	36	14	22
Electronics	32	7	21	3	1	37	0	37
Biotechnology	13	7	6	0	0	57	24	33
Robotics and Automation Technology	12**	4	7	0	0	58*	17	40
Telecommunications - Fiber Optics	4	1	1	0	2	64	5	59
Stationary Engineering	3	1	2	0	0	67	0	67
Major Appliance Installation/Repairing	1	0	1	0	0	69	2	67

* One or more respondents did not answer the question regarding plans to add to the program.
**One or more respondents did not answer the question regarding enrollment.

SOURCE: Dukakis Center Survey of Public High School Administrators

Transportation Occupation Cluster

A similar story holds in the Transportation Cluster. Enrollments are expected to be maintained or expanded in Automotive Technology and Automotive Collision Repair and Refinishing, although there are few plans for schools to add these programs – with the possible exception of Diesel Technology (see **Table 18**).

TABLE 18

Expected Changes in Enrollment and Programming Over the Next 10 Years
Assuming Current Funding Levels: Transportation Occupation Cluster

| Program | Number of Respondents Offering Program | In the next 10 years, the number of respondents who expect to... | | | | Number of Respondents Not Offering Program | In the next 10 years, the number of respondents that have plans to add to the program. | |
		Expand Enrollment	Maintain Enrollment	Reduce Enrollment	Eliminate the Program		Have Plans to Add	Do Not Have Plans to Add
Automotive Technology	65	11	54	0	0	5	0	5
Automotive Collision Repair & Refinishing	49	10	36	2	1	21	1	20
Marine Service Technology	4	2	1	0	1	66*	4	61
Diesel Technology	4	1	3	0	0	66	5	61
Power Equipment Technology	3	0	2	0	1	65	1	64

* One or more respondents did not answer the question regarding plans to add to the program.

Exploratory All Occupation Clusters

Finally, respondents expect to see expanded enrollments in Exploratory programs which provide students with a chance to learn about a variety of occupations before settling on one that they will concentrate in (see **Table 19**).

TABLE 19

Expected Changes in Enrollment and Programming Over the Next 10 Years
Assuming Current Funding Levels: Exploratory All Clusters

| Program | Number of Respondents Offering Program | In the next 10 years, the number of respondents who expect to... | | | | Number of Respondents Not Offering Program | In the next 10 years, the number of respondents that have plans to add to the program. | |
		Expand Enrollment	Maintain Enrollment	Reduce Enrollment	Eliminate the Program		Have Plans to Add	Do Not Have Plans to Add
Exploratory	69	29	39	1	0	1	1	0

All in all, these results suggest that vocational school administrators and those in comprehensive schools with vocational programs seem well aware of where growing labor demand will be strongest and are positioned to maintain programs or expand programs in these critical areas.

Survey Results - Curriculum Changes Under Additional Funding

Finally, we asked respondents to consider which programs they would expect to expand and or add if additional funding were available. The results of this inquiry by occupational cluster are found in **Table 20** (*see next two pages*).

In the Agriculture & Natural Resources Cluster, a large majority of respondents would add or expand programs in Environmental Science and Technology.

In the Arts & Communication Services Cluster, there is a strong preference to add or expand programs in Radio & Television Broadcasting and Design & Visual Communications.

In the Business & Consumer Services Cluster, there is modest interest in adding to programs in Marketing, Office Technology, and Cosmetology, although a large majority would make no change in existing programs even with added funding.

In the Construction Cluster, there is modest interest in adding or expanding programs in Facilities Management,

Plumbing, HVAC, Electricity and Carpentry, but once again a large majority would maintain the programs they already have.

A small number of respondents would add or expand Early Education and Care Programs.

In the Transportation Cluster, there is some sentiment for adding or expanding Diesel Technology and Automotive Technology.

And finally, 28 of 61 respondents would expand their Exploratory Program.

Again, we find that respondents, relying on a range of information about expected occupational growth have selected for addition or expansion programs that will likely have strong future job demand. In this sense, additional funding for vocational education will be put to good use.

In Table 20, green indicates
an expanding program.

Again, we find that respondents, relying on a range of information about expected occupational growth have selected for addition or expansion programs that will likely have strong future job demand. In this sense, additional funding for vocational education will be put to good use.

Adding or Expanding Programs if Additional Funding Available

	Add Program	Expand Program	No Change
Agriculture & Natural Resources Occupational Cluster			
Environmental Science & Technology	33	5	22
Animal Science	13	3	41
Horticulture	6	8	44
Agricultural Mechanics	4	1	49
Arts & Communication Services Occupational Cluster			
Radio & Television Broadcasting	20	5	36
Design & Visual Communications	14	15	35
Graphic Communications	3	11	46
Business & Consumer Services Occupational Cluster			
Marketing	10	6	42
Office Technology	5	9	43
Fashion Technology	4	2	48
Cosmetology	3	17	39
Construction Occupational Cluster			
Facilities Management	15	2	40
Plumbing	10	12	36
Construction Craft Laborer	10	1	44
Cabinetmaking	9	2	45
Heating, Ventilation, Air Conditioning, Refrigeration	8	17	33
Plumbing Technology/Plumber	5	5	45
Sheet Metalworking	5	4	48
Masonry & Tile Setting	5	0	51
Electricity	3	15	41
Painting & Design Technologies	3	1	51
Carpentry	0	18	41
Educational Occupational Cluster			
Early Education and Care	6	12	44
Health Services Occupational Cluster			
Medical Assisting	28	4	28
Practical Nursing LPN	22	6	30
Operating Room Technology	21	0	38
Dental Assisting	15	12	31
Health Assisting	4	27	28
Hospitality & Tourism Occupational Cluster			
Hospitality Management	20	6	32
Culinary Arts	1	15	39

SOURCE: Dukakis Center Survey of Public High School Administrators

Adding or Expanding Programs if Additional Funding Available (continued)

	Add Program	Expand Program	No Change
Information Technology Services Occupational Cluster			
Programming & Web Development	15	14	31
Information Support Services & Networking	15	14	29
Manufacturing, Engineering, & Technological Occupational Cluster			
Biotechnology	33	9	19
Robotics and Automation Technology	30	4	28
Engineering Technology	22	19	19
Telecommunications - Fiber Optics	14	0	43
Machine Tool Technology	12	18	32
Stationary Engineering	8	1	48
Drafting	7	10	42
Metal Fabrication & Joining Technologies	2	11	47
Electronics	2	8	50
Major Appliance Installation/Repairing	1	3	51
Transportation Occupational Cluster			
Diesel Technology	11	1	46
Power Equipment Technology	7	0	50
Marine Service Technology	6	3	48
Automotive Collision Repair & Refinishing	2	10	48
Automotive Technology	0	15	46
Exploratory All Clusters			
Exploratory	0	28	33

According to our survey results, administrators of comprehensive high schools with vocational programs also see a number of areas where they would consider expanding programs if additional funding were available. These are found in **Table 21**. Chief among these are Computer Science, Health Assisting, Dental, Engineering Technology, Culinary Arts, Bank Telling, Personal Finance, Drafting and Barbering.

TABLE 21

Expand	Maintain	Reduce	Eliminate
Computer Science (2)	Design & Visual	Hospitality	Post Graduate Bio-manufacturing (2)
Health Assisting	Fashion Technology (2)	Facilities Management	Post Graduate Construction Management
Dental	Business Management		Post Graduate Dental Assisting
Engineering Technology (2)	Business Technology (2)		Post Graduate Auto Technology
Culinary	Basic Home Repair		Post Graduate Cosmetology
Bank/Teller	Small Engine Repair		
Personal Finance	Culinary Foundations		
Drafting	Transitional Occupational Program		
Barbering (2)	General Shop (Special Needs Students only)		
	Extended Exploratory General Shop		