



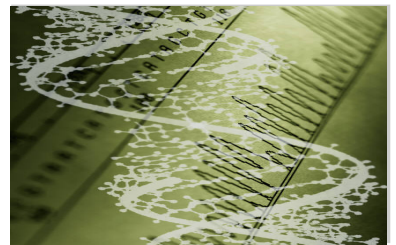
**Massachusetts Mathematics and Science Partnership Title IIB
Annual State-level Evaluation Report**

Cohort 3 Reporting Period: September 1, 2007, through August 31, 2008

Cumulative Reporting Period: February 2, 2004, through August 31, 2008

Prepared for the Massachusetts Department of Elementary and
Secondary Education

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- Appendix A: Participant Background Survey – Cohort 3 9/2007-8/2008**
- Appendix B: Timeline for State-level Evaluation and TA Activities**
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Program Description

The purpose of the Massachusetts Mathematics and Science Partnership Program (MMSP) is to improve student achievement in mathematics, science, and technology/engineering through intensive, high-quality professional development activities that focus on deepening teachers' content knowledge. This multi-year project is funded by the U.S. Department of Education as part of the No Child Left Behind (NCLB) Act Title IIB funding stream. Funding to local partnerships is administered by state education agencies; in Massachusetts this is the Massachusetts Department of Elementary and Secondary Education (ESE), which awards funding through a competitive grant process.

Partnerships awarded these grants are required to include 1) a core partner that has been identified as a high need school district in the subject matter on which the partnership is focusing and 2) a core partner that is a science, technology and/or engineering, or mathematics (STEM) department from an institution of higher education. The partnerships are composed of higher education institutions, school districts, and, in some cases, private organizations involved in providing both pre-service and inservice training to teachers. Partnerships are required to offer courses that equal at least 45 hours of direct instruction followed by at least 20 hours of follow-up contact to support the implementation of course content in the classroom. Partnerships are encouraged to tailor the model used to deliver the professional development and follow-up to best fit the objectives of their programs along with their resources, expertise, and existing infrastructure. Partnership activities are guided by the following goals¹:

- Goal I Develop and implement an effective and sustained course of study for in-service teachers of STEM by integrating the courses of study into schools of arts and sciences and/or education at institutions of higher education.
- Goal II Increase the number of STEM teachers in the partner school districts who are licensed in the subject area(s) and grade level(s) they teach.
- Goal III Increase the number of STEM teachers in the partner school districts who participate in high quality professional development and advance their content knowledge.

The program began in February 2004, and has had five funding periods, defined as follows:

- Year 1: February 2, 2004 through August 31, 2004
- Year 2: September 1, 2004 through August 31, 2005
- Year 3: September 1, 2005 through August 31, 2006
- Year 4: September 1, 2006 through August 31, 2007
- Year 5: September 1, 2007 through August 31, 2008.

The partnerships who received initial funding in Year 1 are referred to as Cohort 1; those who received initial funding in Year 2 are referred to as Cohort 2; those who received initial funding in Year 4 are referred to as Cohort 3.

¹ Program goals were modified slightly between the beginning of the program and the beginning of the most recent funding period.

Report Organization

The purpose of this report is threefold: 1) to provide details regarding only Cohort 3 participation for both years of funding for it, 2) to provide a cumulative summary regarding participation for all cohorts over all funding periods 3) to provide an overview of budgets and involvement of high need districts for all cohorts for all funding periods. Each of these three purposes is addressed in a separate section of this report.

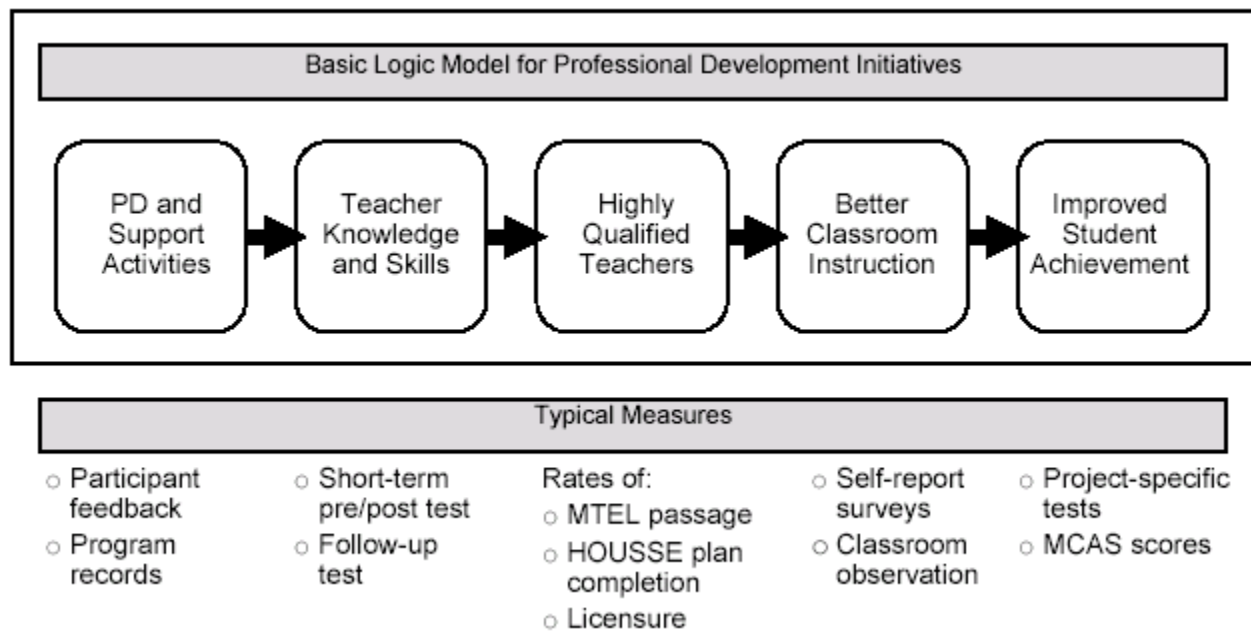
Data supporting the first purpose address the period of September 1, 2006, through August 31, 2008, and data supporting the second and third purposes address the period of February 2, 2004, through August 31, 2008. Participant data were collected through the Participant Background Survey, an instrument developed by the UMass Donahue Institute (UMDI) and administered by partnerships to each participant on the last day of each course. See Appendix A for the survey used during Year 5. The purpose of this survey is to gather data about participants' professional backgrounds and qualifications. This information provides a picture of who the participants are, aids in determining whether the courses are reaching the teachers who most need professional development, and aids in tracking how teacher qualifications may change during the MMSP funding period. Data from the survey regarding teacher licensure, possession of and progress towards earning degrees, and status in terms of Massachusetts Tests for Educator Licensure (MTEL) exams allows determination of the number of teachers who meet criteria defining highly qualified status. Unless noted, data from the survey are reported in terms of unique individuals, regardless of the number of courses taken by each individual.

Data speaking to the strengthening of relationships between partnership members were collected through a section of the local evaluation reports that partnerships were required to submit to the ESE. In this section, partnerships were asked to describe the extent to which their courses had been integrated into activities of their higher education partners.

Evaluation Plan and Activities

State-level Evaluation

Although not required by the U.S. Department of Education, the ESE contracted with UMDI to conduct a state-level evaluation of the MMSP. UMDI's primary role as state-level evaluator is to coordinate program-wide collection of outcome data on behalf of the ESE. Data collection for the state-level evaluation is organized around a basic logic model for professional development initiatives shown below.



Local Evaluation and Related Technical Assistance

In addition to the state-level data collection, each partnership is required to conduct its own local evaluation. In an effort to support strong local evaluations, ESE required that partnerships sub-contract with UMDI to provide technical assistance on design and implementation of their local evaluations. The timeline listing the evaluation activities is found in Appendix B.

Cohort 3 Activity: September 1, 2006 through August 31, 2008

Cohort 3, which began in the 2006-2007 funding period, consisted of nine partnerships. Table 1 shows the funding received by Cohort 3 partnerships for the period beginning in September 2006 and ending in August 2007, for the period beginning in September 2007 and ending in August 2008, and for the cumulation of the two.

Partnership	Sep06-Aug07	Sep07-Aug08	TOTAL
EduTron Lowell (M/S)	\$210,000	\$220,000	\$430,000
EduTron Fitchburg (M)	\$102,000	\$110,000	\$212,000
Lesley University C3 (M)	\$347,911	\$355,626	\$703,537
North Shore (S)	\$196,474	\$194,729	\$391,203
UMass Amherst C3 (M/S)	\$107,424	\$216,281	\$323,705
Salem State College C3 (M)	\$120,882	\$113,551	\$234,433
SE Cape (S)	\$129,438	\$181,420	\$310,858
WPI – Science (S)	\$99,586	\$70,734	\$170,320
Worcester PS (M)	\$231,210		\$231,210
TOTAL	\$1,544,925	\$1,242,341	\$2,787,266

State-level Participant Background Data

Cohort 3 consisted of nine partnerships, with four of the nine partnerships offering mathematics professional development, three offering science professional development, and two offering professional development in both mathematics and science content.

Across both years of funding for Cohort 3, there were 82 courses delivered. Of these 82 courses, 44 were mathematics courses, 34 were science courses, three were technology/engineering courses, and one course covered both math and science content. Of those 82 courses, 44 (54%) were unique, and 38 (46%) were repeat offerings. This section of the report summarizes data collected from participants in these courses.

Across both years of funding for Cohort 3, there were 797 participants, and 255 of them took two or more courses. By the end of the 2007-2008 funding period, 797 unique participants completed the Participant Background Survey on one or more occasions. The term “unique participant” refers to each individual who participated in the program, regardless of how many courses he or she took. Data for items from the survey that help to convey participants’ professional backgrounds and motives for participation are discussed in the remainder of this section. All survey data for this group may be found in Appendix C. The responses to the survey questions are presented as frequencies and percentages. Not all percentages total 100% because many items allowed multiple responses and not all of the participants responded to all of the items.

Position of Participants

At the time of their last completed survey from a Cohort 3 MMSP course, 93% of course participants identified themselves as teachers. Of all respondents, 74% were regular education teachers; 13% were special education or

special education inclusion teachers; 2% were ELL teachers; 2% were department heads or curriculum coordinators; 2% were principals, assistant principals, or headmasters; 1% were support specialists; 1% were paraprofessionals; 1% were long-term substitutes; <1% were superintendents or assistant superintendents; and 4% indicated that they held “other” positions.

Content Taught

The distribution of teaching areas of respondents at the time of the survey is shown in Table 2. Because respondents identified *all* teaching areas that applied to their positions at the time of the survey, some selected multiple responses, so frequency totals exceed the number of respondents and percentages exceed 100%.

At the time of their last MMSP course, 33% of Cohort 3 participants were teaching mathematics, 39% were teaching science, and 28% were teaching all subjects at the elementary level.

Table 2. Teaching Areas: Cohort 3 Participants

Teaching Areas (Multiple responses permitted)	Sep06-Aug07 <i>n</i> =458		Sep07-Aug08 <i>n</i> =477		TOTAL <i>n</i> =797	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Mathematics	153	33	161	34	263	33
Any science area	151	33	213	45	312	39
<i>General Science</i>	72	16	107	22	156	20
<i>Biology</i>	24	5	25	5	40	5
<i>Earth Science</i>	13	3	15	3	24	3
<i>Chemistry</i>	18	4	27	6	36	5
<i>Physics</i>	15	3	25	5	35	4
<i>Technology/Engineering</i>	9	2	14	3	21	3
Computer Science	5	1	N/A	N/A	5	1
Elementary (all subjects)	148	32	117	25	226	28
Elementary Mathematics	41	9	36	8	64	8
Other	21	5	14	3	33	4
Not Currently Teaching	19	4	39	8	58	7

Teaching Experience of Participants

At the time of their last completed survey from an MMSP course, the teaching experience of the 797 unique Cohort 3 participants was as follows: 18% were in their first to third year of teaching, 40% had between four and ten years experience in education, 25% had between 11 and 20 years of experience, 15% reported over 20 years of experience, and 2% did not report.

Teaching Levels of Participants

For reporting purposes, schools in the participating districts were organized into categories of elementary schools (grades K-5), K-8 schools, middle schools (grades 6-8), and high schools (grades 9-12). At the time of their last completed survey from an MMSP course, 39% of Cohort 3 participants were teaching in an elementary or K-8 school, 43% were teaching in a middle school, 13% were teaching in a high school, 1% were teaching at both the middle and high school levels, and less than 1% were teaching at either all levels or other levels such as pre-K or an adult level. Those remaining either were not currently teaching or the level at which they taught was unknown.

Types of Schools of Participants

As shown in Table 3, 97% of unique Cohort 3 participants worked in a public school setting, and 2% worked in a non-public school setting.

Table 3. Types of Schools of Unique Participants: Cohort 3 Participants

School Type	Sep06-Aug07		Sep07-Aug08		TOTAL*	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Public Schools (includes public charter schools)	447	98	462	97	772	97
Non-public School	7	2	7	2	12	2
Other or No Response	4	<1	8	2	13	2
TOTAL	458	100	477	100	797	100

*In this table and in others throughout this document that don't specify otherwise, the figures reported in the "Total" column do not represent a sum of figures from all prior years; instead, these figures refer to unique participants.

High Need Status of Districts of Participants

MMSP partnerships were required to include at least one high need district. Appendix D identifies the criteria for the high need designation.

The ESE expected that at least 50% of participants in each partnership would come from high need districts, and further, they set an informal goal that at least 75% of participants for each partnership would come from high need districts. Of all Cohort 3 participants, 73% came from high need districts. Table 4 shows that by the end of the 2007-2008 funding period, 75% of Cohort 3 participants from public schools had come from high need districts.

Table 4. High Need Status of Unique Participants from Public Schools

School Type	Sep06-Aug07		Sep07-Aug08		TOTAL	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
High Need District	343	77	335	73	578	75
Non-high Need District	94	21	122	26	189	24
Unknown	10	2	5	1	5	1
TOTAL	447	100%	462	100%	772	100%

Table 5 presents the number of participants from high need districts organized by each partnership and reveals that over the course of each Cohort 3 partnership's involvement in MMSP, six of the nine partnerships had at least 50% of their participants coming from high need districts, and five of nine partnerships exceeded the informal goal of having at least 75% of the participants come from high need districts.

As of their last Cohort 3 course, of the 255 individuals who took multiple courses, approximately 79% were from high need public school districts, approximately 19% were from other public school districts, and approximately 2% either were from private schools or did not provide information on their districts.

Table 5. Cohort 3 High Need District Participants by Partnership							
Partnership	High Need Districts	Sep06-Aug07		Sep07-Aug08		TOTAL	
		<i>n</i>	%	<i>n</i>	%	<i>n</i> *	%
Edu Tron Lowell (M/S)	Lowell	54	100%	66	100%	113	100%
EduTron Fitchburg (M)	Fitchburg	17		20		34	
	Gardner	7		7		11	
	Leominster	10		26		33	
	Subtotal	34	100%	53	98%	78	99%
Lesley University (M)	Attleboro	0		1		1	
	Brockton	13		3		12	
	Fairhaven	3		1		2	
	Fall River	26		18		28	
	Haverhill PS	29		23		33	
	Holyoke	29		18		31	
	Malden	1		0		1	
	New Bedford	4		0		4	
	Randolph	13		14		18	
	Revere	0		2		2	
	Saugus	2		5		6	
	Somerville	0		11		11	
	Ware	0		1		1	
	Subtotal	120	94%	97	90%	150	92%
North Shore (S)	Fitchburg	1		0		1	
	Lynn	0		3		3	
	Revere	0		9		9	
	Somerville	16		14		22	
	Lowell Community CS	0		1		1	
	Subtotal	17	41%	27	40%	36	40%
UMass Amherst (M/S)	Athol-Royalston	1		0		1	
	Chicopee	5		3		8	
	Easthampton	0		1		1	
	Gateway	1		0		1	
	Greenfield	1		0		1	
	Gill- Montague	0		1		1	
	Holyoke	3		4		6	
	Ludlow	2		0		2	
	New Leadership CS	1		0		1	
	North Adams	0		1		1	
	Pittsfield	0		1		1	
	South Hadley	2		0		2	
	Springfield	3		9		12	
	West Springfield	3		0		3	
Subtotal	22	46%	19	38%	41	45%	
Salem State College (M)	Boston	1		0		1	
	Chelsea	1		0		1	

Table 5. Cohort 3 High Need District Participants by Partnership								
Partnership	High Need Districts	Sep06-Aug07		Sep07-Aug08		TOTAL		
		<i>n</i>	%	<i>n</i>	%	<i>n</i> *	%	
Salem State College (M)	Everett	3		1		3		
	Gloucester	6		3		6		
	Haverhill PS	4		3		6		
	Lynn	10		10		29		
	Malden	1		2		2		
	Methuen	0		1		1		
	Peabody	0		2		2		
	Revere	0		1		1		
	Salem	3		3		6		
	Winthrop	1		0		1		
	Worcester	1		0		1		
	Subtotal		41	82%	26	65%	60	77%
	SE/Cape (S)	Barnstable	1		5		6	
Brockton		20		22		34		
Fall River		0		5		5		
Horace Mann CS		2		0		2		
New Bedford		8		8		13		
Subtotal			31	66%	40	51%	60	55%
WPI-Science (S)	Worcester	3	16%	7	54%	13	43%	
Worcester PS (M)	Worcester	34	83%	N/A	N/A	34	83%	

*Note that if this column is summed, the total will not correspond to relevant data in Table 4 for two reasons: 1) Table 4 presents data for unique participants across all partnerships while Table 5 presents data for unique participants only within partnerships (and some participants took courses through multiple partnerships) and 2) The districts of some of those participants who crossed partnerships were not consistently classified as high need districts (either because of the content of the course or because of the cohort of the partnership offering the course).

Reasons for Participation in MMSP Courses

For each course taken, respondents identified all of their reasons for participating. Unlike in the earlier portions of this report where data were presented for unique participants, data for this topic are presented for all course seats, since responses are uniquely relevant to each distinct course that a participant took. Table 6 presents findings for all 1333 seats for all courses taken by Cohort 3 participants during the 2006-2007 and 2007-2008 funding periods.

Repeat Participation

Cohort 3 partnerships were successful at encouraging and retaining repeat participants. All of the nine partnerships offered multiple courses and all had participants who attended more than one course within that partnership. In all, 255 participants attended multiple courses within Cohort 3. (Three of these participants took courses from other Cohort 3 partnerships.) Table 7 provides details regarding repeat participation, including information on the 65 repeat participants who took courses from partnerships from previous MMSP cohorts. (The tables found on pages 18 – 26 include cumulative data on repeat participation, as does Table 27.)

Table 6. Reasons for Participation: Cohort 3, All Seats

Reasons for Participation (Multiple responses permitted)	Sep06-Aug07		Sep07-Aug08		TOTAL	
	<i>n</i>	% of 632 course seats	<i>n</i>	% of 701 course seats	<i>N</i>	% of 1333 course seats
To obtain graduate credit	464	73%	525	75%	989	74%
To increase knowledge in content	438	69%	436	62%	874	66%
To pursue a personal interest	213	34%	174	25%	387	29%
To earn PDPs for recertification	187	30%	192	27%	379	28%
To get an additional license (certification)	134	21%	124	18%	258	19%
To prepare for the Massachusetts Test for Educator Licensure (MTEL)	113	18%	105	15%	218	16%
To earn PDPs for HOUSSE plan requirement	62	10%	N/A	N/A	62	5%
To follow an administrator's suggestion	41	6%	30	4%	71	5%
To obtain a first license (certification)	13	2%	25	4%	38	3%
Other	43	7%	46	7%	89	7%

Table 7. Repeat Participants: Cohort 3 Partnerships

Partnership	Number of Courses Offered to Date	Total Number of Unique* Participants to Date	Number Taking Multiple Courses in Cohort 3	Number Taking One Course in Cohort 3 & One or More Courses in Previous Cohorts	Number Taking Multiple Courses in Cohort 3 & Previous Cohorts
EduTron Lowell (M/S)	6	113	24	0	0
EduTron Fitchburg (M)	4	79	24	13	8
Lesley University (M)	23	163	92	1	3
North Shore (S)	18	90	29	0	2
UMass Amherst (M/S)	9	94	14	10	5
Salem State (M)	8	78	25	15	6
SE/Cape (S)	9	110	40	1	0
WPI – Science (S)	2	30	2	1	0
Worcester Public Schools (M)	3	40	5	0	0
TOTAL	82	797	255	41	24

*Participants who participated in multiple courses across partnerships were counted only once in the partnership of their most recent course.

Attrition

Course attrition rates were generally low and averaged less than 5%. Of the 82 Cohort 3 courses delivered, 47 (57%) had an attrition rate of 0%, 19 (23%) had an attrition rate ranging between 1% and 10%, and 15 (18%) had an attrition rate of greater than 10%. Table 8 provides a breakdown, by partnership, of enrollment and attrition rates. Appendix E provides a breakdown, by course, of enrollment and attrition rates.

Table 8. Total Enrollment and Attrition Information: Cohort 3 Partnerships

Partnership	Number of Courses Offered		Number of Participants Enrolled First Day		Number of Participants Completed Course		Attrition Rate	
	Sep 06 - Aug 07	Sep 07 - Aug 08	Sep 06 - Aug 07	Sep 07 - Aug 08	Sep 06 - Aug 07	Sep 07 - Aug 08	Sep 06 - Aug 07	Sep 07 - Aug 08
EduTron Lowell (M/S)	2	4	76	85	76	81	0%	5%
EduTron Lowell (M)	1	3	36	91	36	85	0%	7%
Lesley University (M)	10	13	271	250	260	243	4%	3%
North Shore (S)	9	9	74	101	69	99	7%	2%
UMass Amherst (M/S)	4	5	57	68	54	59	5%	13%
Salem State (M)	4	4	73	54*	67	47*	8%	13%
SE/Cape (S)	3	6	57	117	54	111	5%	5%
WPI - Science (S)	1	1	20	13	19	13	5%	0%
Worcester Public Schools	3	N/A	54	N/A	49	N/A	9%	N/A
All Partnerships	37	45	718	779	684	738	5%	5%

*Excludes data for one course, which were missing.

Highly Qualified Status

For Cohort 3 through the end of the 2007-2008 funding period, 23 unique participants attained highly qualified status. Of the 23 who attained highly qualified status, nine did so by passing the appropriate MTEL, two did so by obtaining undergraduate equivalents in content areas, one did so by completing a sufficient number of PDPs on a HOUSSSE plan, one did so by earning a teaching license, one did so by meeting two or more criteria simultaneously, and two did so by passing appropriate MTEL tests and changing their positions. In addition, seven others did so merely by changing their positions.

Of the 23 who attained highly qualified status, eight were from the Lesley University (M) partnership; four were from the Salem State (M) partnership; three were from the EduTron Fitchburg (M) partnership; and two were from each of the following partnerships: EduTron Lowell (M/S), North Shore (S), UMass Amherst (M/S), and SE/Cape. Of the 23 who attained highly qualified status, 19 began participating during Cohort 3 while four began participating prior to Cohort 3. Of the 19 whose participation began during Cohort 3, seven were from the Lesley University (M) partnership; three were from the EduTron Fitchburg (M) partnership; two were from each of the following partnerships: EduTron Lowell (M/S), North Shore (S), Salem State (M), SE/Cape (S); and one was from UMass Amherst (M/S). Of the four whose participation began prior to Cohort 3, two were from the Salem State (M) partnership and one came from each of the Lesley (M) and UMass Amherst (M/S) partnerships. An identification of the criteria by which teachers who gained highly qualified status could demonstrate competency in their subject matter may be found in Appendix F.

Licensure and Degrees Held in Subjects Taught

By the end of the 2007-2008 funding period for Cohort 3, 218 regular education teachers, 21 special education teachers, and 7 ELL teachers reported teaching subjects in science or technology/engineering. Tables 9a, 9b, and 9c show how many teachers taught each individual science or technology/engineering subject from Cohort 3 through the 2007-2008 funding period. The tables also show the percentages of teachers whose survey responses indicated they were licensed in the subject they taught, and they show the percentages of teachers whose survey responses indicated they held a degree in the subject they taught. Table 9a provides information for regular education teachers, Table 9b provides information for special education teachers, and Table 9c provides information for ELL teachers. (The numbers presented in these tables exceed the number of teachers who reported

teaching these subjects because some teachers taught more than one subject.) Across all science subject areas for regular education teachers, the licensing reported appeared to be appropriate for approximately 61% of the science subjects taught, and the degrees held corresponded to the science subject taught for approximately 28% of the science subjects taught. Across all science subject areas for special education teachers, the licensing reported appeared to be appropriate for approximately 41% of the science subjects taught, and the degree held by one teacher translated to a 3% correspondence between degree and subject taught. Across all science subject areas for ELL teachers, the licensing reported appeared to be appropriate for 50% of the subjects taught, and the degree held by one teacher translated to a 13% correspondence between degree and subject taught.

To see the extent to which licensure and degree were appropriate for any particular type of teacher for any particular subject taught, look in the relevant table at data in the row corresponding to the subject of interest and in the column corresponding to the time period of interest. For example, to see the extent to which licensure and degree were appropriate for just regular education biology teachers in all of Cohort 3, look at Table 9a in the cells of the “Total” column in the row for the subject area “Biology” to learn that 31 teachers taught regular education biology and that of those 31, 71% were licensed in biology and 65% held degrees in biology.

Table 9a. Cohort 3 Science and Technology Teaching Areas – Regular Education

Subject	Sep06-Aug07			Sep07-Aug08			Total		
	Number of Teachers	License in Subject Taught	Degree in Subject Taught	Number of Teachers	License in Subject Taught	Degree in Subject Taught	Number of Teachers	License in Subject Taught	Degree in Subject Taught
	<i>n</i>	%*	%*	<i>n</i>	%*	%*	<i>n</i>	%	%
General Science	59	59	20	90	79	22	131	73	21
Biology	21	62	67	18	78	61	31	71	65
Chemistry	18	33	17	24	58	38	34	53	32
Physics	14	43	14	23	44	30	33	46	27
Earth Science	11	45	27	12	33	25	20	35	20
Technology/Engineering	8	13	13	13	31	23	20	25	20

*Of the number of regular education participants teaching this subject for this period

Table 9b. Cohort 3 Science and Technology Teaching Areas – Special Education

Subject	Sep06-Aug07			Sep07-Aug08			Total		
	Number of Teachers	License in Subject Taught	Degree in Subject Taught	Number of Teachers	License in Subject Taught	Degree in Subject Taught	Number of Teachers	License in Subject Taught	Degree in Subject Taught
	<i>n</i>	%*	%*	<i>n</i>	%*	%*	<i>n</i>	%	%
General Science	10	10	10	9	44	0	15	33	7
Biology	3	0	0	6	33	0	8	25	0
Chemistry	2	0	0	3	67	0	3	67	0
Physics	0	0	0	2	100	0	2	100	0
Earth Science	0	0	0	3	67	0	4	50	0
Technology/Engineering	0	0	0	0	0	0	0	0	0

*Of the number of special education participants teaching this subject for this period

Table 9c. Cohort 3 Science and Technology Teaching Areas – ELL Education			
Subject	Sep07-Aug08		
	Number of Teachers	<i>License in Subject Taught</i>	<i>Degree in Subject Taught</i>
	<i>n</i>	<i>%*</i>	<i>%*</i>
General Science	6	33	0
Biology	1	100	100
Chemistry	0	0	0
Physics	0	0	0
Earth Science	0	0	0
Technology/Engineering	1	100	0

*Of the number of ELL education participants teaching this subject for this period

By the end of the 2007-2008 funding period for Cohort 3, 249 regular education teachers, 44 special education teachers, and six ELL teachers reported teaching mathematics. Tables 10a, 10b, and 10c show how many Cohort 3 teachers taught at each mathematics level through the 2007-2008 funding period. The tables also show the percentages of teachers whose survey responses indicated they were licensed in the mathematics level at which they taught, and they show the percentages of teachers whose survey responses indicated they held a degree in mathematics. Table 10a provides information for regular education teachers, Table 10b provides information for special education teachers, and Table 10c provides information for ELL teachers. (The sum of the numbers presented in each of Tables 10a and 10b exceeds the number of teachers who reported teaching mathematics because some teachers taught mathematics at both the elementary and middle school levels.)

From an “ease-of-reading perspective,” it would be ideal merely to report on the percentages of teachers who were licensed to teach mathematics and the percentage of teachers who held mathematics degrees. Sometimes, though, teachers hold multiple positions and may only be licensed to teach some of what they are teaching, and what is really desired is to understand the extent to which what is being taught is done so by individuals licensed to teach it and by individuals who hold relevant degrees. As a result, the explanations of data that follow are done so in terms of teaching positions.

For MMSP mathematics teaching positions in regular education, the licensing appeared to be appropriate for approximately 76% of positions held, and 19% of the positions were held by individuals with mathematics degrees. For special education teachers, the licensing appeared to be appropriate for approximately 28% of the positions held, and 4% of the positions were held by individuals with mathematics degrees. For ELL teachers, the licensing held by one teacher was relevant to her position and translated to a 17% correspondence across all ELL mathematics courses taught, and the mathematics degree held by one teacher also translated to a 17% correspondence between degree and position when viewed across all ELL mathematics courses taught.

To see the extent to which licensure and degree were appropriate for a particular type of teacher for a particular mathematics level taught, look in the relevant table at data in the row corresponding to the level of interest and in the column corresponding to the time period of interest. For example, to see the extent to which licensure and degree were appropriate for just regular education middle school math teachers in only 2007-2008, look at Table 10a in the cells of the “Sep07-Aug08” column in the row for the subject area “Middle School” to learn that 103 teachers taught regular education middle school mathematics and that of those 103, 70% were licensed to teach middle school mathematics and 21% held mathematics degrees.

Table 10a. Cohort 3 Mathematics Teacher Levels – Regular Education

Level	Sep06-Aug07			Sep07-Aug08			Total		
	Number of Teachers	Licensed at Level	Degree in Math	Number of Teachers	Licensed at Level	Degree in Math	Number of Teachers	Licensed at Level	Degree in Math
	<i>n</i>	%*	%*	<i>n</i>	%*	%*	<i>n</i>	%*	%*
Elementary School	41	42	0	31	100	16	52	96	10
Middle School	106	69	10	103	70	21	171	70	18
High School	19	79	42	18	78	50	32	78	41
Middle & High School	0	0	0	3	67	0	3	67	0
TOTAL Math	166	63	11	155	77	23	258	76	19

*Of the number of regular education participants teaching mathematics at this level for this period

Table 10b. Cohort 3 Mathematics Teacher Levels – Special Education

Level	Sep06-Aug07			Sep07-Aug08			Total		
	Number of Teachers	Licensed at Level	Degree in Math	Number of Teachers	Licensed at Level	Degree in Math	Number of Teachers	Licensed at Level	Degree in Math
	<i>n</i>	%*	%*	<i>n</i>	%*	%*	<i>n</i>	%*	%*
Elementary School	1	0	0	1	100	0	2	50	0
Middle School	16	25	0	23	35	9	35	34	6
High School	6	0	0	4	0	0	8	0	0
Middle & High School	1	0	0	0	0	0	1	0	0
TOTAL Math	24	17	0	28	32	7	46	28	4

*Of the number of special education participants teaching mathematics at this level for this period

Table 10c. Cohort 3 Mathematics Teacher Levels – ELL Education

Level	Sep07-Aug08		
	Number of Teachers	Licensed at Level	Degree in Math
	<i>n</i>	%*	%*
Elementary School	0	0	0
Middle School	5	20	0
High School	1	0	100
Middle & High School	0	0	0
TOTAL Math	6	17	17

*Of the number of ELL education participants teaching mathematics at this level for this period

Degrees Currently Pursued

Information on degrees currently being pursued in science, technology/engineering, and mathematics was derived from the most recently completed survey of each individual. Of the 218 regular education teachers, 21 special education teachers, and seven ELL teachers in Cohort 3 through the 2007-2008 funding period who reported teaching in science or technology/engineering areas, 15 were pursuing science degrees in their current areas of teaching: 11 general science teachers were pursuing master's degrees in general science, one general science teacher was pursuing a master's degree and a CAGS degree in general science, one general science teacher was pursuing a bachelor's degree in general science, one biology and general science teacher was pursuing a master's degree in biology, and one physics teacher was pursuing a master's degree in physics. Additionally, five science teachers were pursuing degrees in areas of science they did not currently teach: Two who taught earth science and one who taught physics were all pursuing master's degrees in general science, one who taught general science was pursuing a master's in biology, and another who taught general science was pursuing a master's in technology and engineering.

Of the 249 regular education teachers, 44 special education teachers, and six ELL teachers who reported teaching mathematics in Cohort 3 through the 2007-2008 funding period, 18 were pursuing mathematics degrees: One high school teacher, one middle school teacher, and one elementary mathematics teacher were each pursuing a CAGS in mathematics; one elementary mathematics teacher was pursuing a bachelor's degree in mathematics. Of the 14 remaining, all were pursuing master's degrees in mathematics: eight taught middle school mathematics, five taught high school mathematics, and one taught both middle and high school level mathematics.

Content Knowledge Gains

As a grant condition, partnerships were required to use a pre-course test and post-course test for each MMSP course to assess participants' knowledge growth of the content taught in the course. For each course, the same instrument served as both the pre- and post-course test. While partnerships were permitted to locate and use an instrument with established reliability and validity, it was most often the case that such instruments were not available because a priority was placed on utilizing assessments that would reflect the precise content taught in each course. As a result, the faculty members who had developed the courses usually developed the assessments, and typically, neither validity or reliability were determined for them because time and resource constraints prohibited doing so.

Data were analyzed only for participants who completed both pre- and post-course assessments. To determine if the scores showed statistically significant changes between pre- and post-course test administrations, a paired samples *t*-test was used for each course for which ten or more participants completed both pre- and post-course assessments, and a Wilcoxon Matched Pairs test was used for each course for which fewer than ten participants completed both pre- and post-course assessments.

Gains in average percentage of items correct between pre- and post-course test administrations occurred in all 82 of the 82 courses delivered across all Cohort 3 partnerships through the 2007-2008 funding period, and statistically significant improvements in scores on content knowledge assessments occurred in 90% of those courses. Of the eight courses not showing statistically significant improvement in scores, though, four had fewer than six participants, the smallest sample size at which it is possible to detect statistical significance at the level used for these analyses. Table 11 provides an overview, by subject matter of courses delivered, of the numbers of courses that did and did not show statistically significant gains, and it reveals that statistically significant gains were seen in all Cohort 3 math courses. For detailed information on mean pre- and post-course content knowledge scores by partnership and by course, see Appendix G.

Table 11. Number of Courses with Statistically Significant and Non-significant Gains in Mean Content Knowledge Scores for Cohort 3

Content Area	Sep06-Aug07			Sep07-Aug08			Total		
	Delivered	Significant Pre/Post Gains	No Significant Gains	Delivered	Significant Pre/Post Gains	No Significant Gains	Delivered	Significant Pre/Post Gains	No Significant Gains
Math	21	21	0	23	23	0	44	44	0
Science & Technology/Engineering	15	11	4	22	19	3	37	30	7
Math and Science	1	0	1	0	0	0	1	0	1
TOTAL	37	32	5	45	42	3	82	74	8

Partnership-level Participant Background Data

Presented in Table 12 through Table 20, this section offers an overview of selected participant survey data for each Cohort 3 partnership. These data were collected at the end of each course that was offered by each partnership. The responses to the survey questions are presented as frequencies and percentages of the total number of participants in the partnership for the 2006-2007 and 2007-2008 periods and a cumulation of both. In cases where not all participants responded to all of the items and in cases where multiple responses were permitted, percentages presented may not total 100%.

The section of each table identified as “Participants Who Took Multiple Courses” contains three categories. Each is defined as follows: “In Cohort 3” refers to participants who took two or more courses within the context of Cohort 3 – they participated in no courses that had been offered during previous cohorts. “In previous cohorts” refers to participants who took one course through Cohort 3 and had taken at least one additional course that had been offered during a previous cohort. “In Cohort 3 & previous cohorts” refers to participants who took two or more courses within Cohort 3 and also took at least one additional course during a previous cohort.

The “Highly Qualified” section of each table includes the response option “Private school/Not applicable.” Participants categorized under this option refer to those who either were teaching at a private school or for whom highly qualified status would be irrelevant, such as school administrators.

Table 12. EduTron Lowell Participant Background Information (M/S)

	Number of Participants		Number of Participants		Number of Participants	
	Sep06 - Aug07		Sep07 - Aug08		TOTAL	
Total Number of Participants	54		66		113	
Participants Who Took Multiple Courses	12	(22%)	16	(24%)	24	(21%)
In Cohort 3	0	(0%)	0	(0%)	0	(0%)
In previous cohorts	0	(0%)	0	(0%)	0	(0%)
In Cohort 3 & previous cohorts	0	(0%)	0	(0%)	0	(0%)
Teach Regular Education	24	(44%)	39	(59%)	71	(63%)
Teach Special Education (sole and inclusion)	7	(13%)	7	(11%)	15	(13%)
Teach ELL, ESL, or Sheltered English Immersion			2	(3%)	2	(2%)
Teach Elementary (all content areas)	15	(28%)	17	(26%)	31	(71%)
Teach Elementary Math	7	(13%)	10	(15%)	15	(13%)
Teach Mathematics Above Elementary	16	(30%)	25	(38%)	37	(33%)
Teach Science or Technology/Engineering	9	(17%)	22	(33%)	29	(26%)
Teaching in High Need District	54	(100%)	66	(100%)	113	(100%)
Highly Qualified						
Yes	11	(20%)	30	(45%)	39	(35%)
No	23	(43%)	18	(27%)	35	(31%)
In some, but not all areas	2	(4%)	4	(6%)	6	(5%)
Cannot be determined	1	(2%)	7	(11%)	11	(10%)
Private school/Not applicable	17	(31%)	7	(11%)	22	(20%)
Have Passed One or More MTEL Exams	17	(31%)	26	(40%)	41	(36%)
Hold One or More Teaching Licenses	49	(91%)	64	(97%)	106	(94%)

Table 13. EduTron Fitchburg Participant Background Information (M)

	Number of Participants		Number of Participants		Number of Participants			
	Sep06 - Aug07		Sep07 - Aug08		TOTAL			
Total Number of Participants	34		54		79			
Participants Who Took Multiple Courses	In Cohort 3		0	(0%)	16	(30%)	24	(30%)
	In previous cohorts		18	(53%)	1	(2%)	21	(27%)
	In Cohort 3 & previous cohorts		0	(0%)	8	(15%)	8	(10%)
Teach Regular Education	23		33		52		(66%)	
Teach Special Education (sole and inclusion)	8		11		17		(22%)	
Teach ELL, ESL, or Sheltered English Immersion			0		0		(0%)	
Teach Elementary (all content areas)	13		29		38		(48%)	
Teach Elementary Math	1		5		6		(8%)	
Teach Mathematics Above Elementary	17		15		28		(35%)	
Teach Science or Technology/Engineering	4		2		4		(5%)	
Teaching in High Need District	34		53		78		(99%)	
Highly Qualified	Yes		19	(56%)	18	(33%)	31	(39%)
	No		8	(24%)	22	(41%)	29	(37%)
	In some, but not all areas		3	(9%)	1	(2%)	3	(4%)
	Cannot be determined		2	(6%)	6	(11%)	7	(9%)
	Private school/Not applicable		2	(6%)	7	(13%)	9	(11%)
Have Passed One or More MTEL Exams	17		23		36		(46%)	
Hold One or More Teaching Licenses	31		54		76		(96%)	

Table 14. Lesley University Participant Background Information (M)

	Number of Participants		Number of Participants		Number of Participants	
	Sep06 - Aug07		Sep07 - Aug08		TOTAL	
Total Number of Participants	127		108		165	
Participants Who Took Multiple Courses						
In Cohort 3	66	(52%)	73	(68%)	94	(57%)
In previous cohorts	0	(0%)	1	(1%)	5	(3%)
In Cohort 3 & previous cohorts	4	(3%)	3	(3%)	4	(2%)
Teach Regular Education	92	(72%)	62	(57%)	114	(69%)
Teach Special Education (sole and inclusion)	12	(9%)	15	(14%)	22	(13%)
Teach ELL, ESL, or Sheltered English Immersion			2	(2%)	4	(2%)
Teach Elementary (all content areas)	49	(38%)	38	(35%)	60	(36%)
Teach Elementary Math	15	(12%)	13	(12%)	20	(12%)
Teach Mathematics Above Elementary	53	(42%)	46	(43%)	73	(44%)
Teach Science or Technology/Engineering	3	(2%)	2	(2%)	5	(3%)
Teaching in High Need District	120	(94%)	97	(90%)	152	(92%)
Highly Qualified						
Yes	63	(50%)	52	(48%)	75	(46%)
No	45	(35%)	34	(32%)	61	(37%)
In some, but not all areas	2	(2%)	0	(0%)	1	(1%)
Cannot be determined	0	(0%)	10	(9%)	12	(7%)
Private school/Not applicable	17	(13%)	12	(11%)	16	(10%)
Have Passed One or More MTEL Exams	61	(48%)	55	(51%)	77	(47%)
Hold One or More Teaching Licenses	119	(94%)	103	(95%)	157	(95%)

Table 15. North Shore Participant Background Information (S)

	Number of Participants		Number of Participants		Number of Participants	
	Sep06 - Aug07		Sep07 - Aug08		TOTAL	
Total Number of Participants	41		68		91	
Participants Who Took Multiple Courses	In Cohort 3		24 (35%)		30 (33%)	
	In previous cohorts		0 (0%)		2 (2%)	
	In Cohort 3 & previous cohorts		1 (2%)		2 (2%)	
Teach Regular Education	28 (68%)		56 (82%)		76 (84%)	
Teach Special Education (sole and inclusion)	10 (24%)		7 (10%)		12 (13%)	
Teach ELL, ESL, or Sheltered English Immersion			1 (2%)		1 (1%)	
Teach Elementary (all content areas)	2 (5%)		3 (4%)		3 (3%)	
Teach Elementary Math	0 (0%)		0 (0%)		0 (0%)	
Teach Mathematics Above Elementary	7 (17%)		8 (12%)		11 (12%)	
Teach Science or Technology/Engineering	33 (80%)		60 (88%)		78 (86%)	
Teaching in High Need District	16 (39%)		27 (40%)		36 (40%)	
Highly Qualified	Yes		38 (56%)		51 (56%)	
	No		18 (27%)		24 (26%)	
	In some, but not all areas		7 (10%)		8 (9%)	
	Cannot be determined		2 (3%)		4 (4%)	
	Private school/Not applicable		3 (4%)		4 (4%)	
Have Passed One or More MTEL Exams	18 (44%)		46 (68%)		55 (60%)	
Hold One or More Teaching Licenses	39 (95%)		65 (96%)		86 (95%)	

Table 16. UMass Amherst Participant Background Information (M/S)

	Number of Participants		Number of Participants		Number of Participants			
	Sep06 - Aug07		Sep07 - Aug08		TOTAL			
Total Number of Participants	48		50		94			
Participants Who Took Multiple Courses	In Cohort 3		4	(8%)	11	(22%)	14	(15%)
	In previous cohorts		7	(15%)	3	(6%)	10	(11%)
	In Cohort 3 & previous cohorts		2	(4%)	3	(6%)	3	(3%)
Teach Regular Education	37		38		72		(77%)	
Teach Special Education (sole and inclusion)	6		5		10		(11%)	
Teach ELL, ESL, or Sheltered English Immersion			2		3		(3%)	
Teach Elementary (all content areas)	8		5		13		(14%)	
Teach Elementary Math	2		0		2		(2%)	
Teach Mathematics Above Elementary	18		23		41		(43%)	
Teach Science or Technology/Engineering	20		17		35		(37%)	
Teaching in High Need District	22		20		41		(44%)	
Highly Qualified	Yes		27	(56%)	31	(62%)	57	(60%)
	No		15	(31%)	10	(20%)	23	(24%)
	In some, but not all areas		2	(4%)	2	(4%)	4	(4%)
	Cannot be determined		1	(2%)	2	(4%)	3	(3%)
	Private school/Not applicable		3	(6%)	5	(10%)	8	(8%)
Have Passed One or More MTEL Exams	24		32		54		(57%)	
Hold One or More Teaching Licenses	46		41		84		(88%)	

Table 17. Salem State College Participant Background Information (M)

	Number of Participants		Number of Participants		Number of Participants	
	Sep06 - Aug07		Sep07 - Aug08		TOTAL	
Total Number of Participants	50		40		78	
Participants Who Took Multiple Courses	9 (18%)		16 (40%)		25 (32%)	
In Cohort 3	17 (34%)		0 (0%)		21 (27%)	
In previous cohorts	4 (8%)		3 (8%)		6 (8%)	
In Cohort 3 & previous cohorts						
Teach Regular Education	38 (76%)		27 (68%)		54 (69%)	
Teach Special Education (sole and inclusion)	9 (18%)		6 (15%)		14 (18%)	
Teach ELL, ESL, or Sheltered English Immersion			2 (5%)		2 (3%)	
Teach Elementary (all content areas)	7 (14%)		1 (3%)		8 (10%)	
Teach Elementary Math	4 (8%)		0 (0%)		3 (4%)	
Teach Mathematics Above Elementary	35 (70%)		31 (78%)		55 (71%)	
Teach Science or Technology/Engineering	8 (16%)		5 (13%)		11 (14%)	
Teaching in High Need District	41 (82%)		26 (65%)		60 (77%)	
Highly Qualified	33 (66%)		21 (53%)		44 (56%)	
Yes	11 (22%)		10 (25%)		20 (26%)	
No	0 (0%)		1 (3%)		1 (1%)	
In some, but not all areas	2 (4%)		3 (8%)		5 (6%)	
Cannot be determined	4 (8%)		5 (13%)		8 (10%)	
Private school/Not applicable						
Have Passed One or More MTEL Exams	26 (52%)		22 (55%)		40 (51%)	
Hold One or More Teaching Licenses	47 (94%)		36 (90%)		71 (91%)	

Table 18. SE/Cape Participant Background Information (S)

	Number of Participants		Number of Participants		Number of Participants	
	Sep06 - Aug07		Sep07 - Aug08		TOTAL	
Total Number of Participants	47		78		111	
Participants Who Took Multiple Courses	7 (15%)		35 (45%)		41 (37%)	
In Cohort 3	0 (0%)		1 (1%)		1 (1%)	
In previous cohorts	0 (0%)		0 (0%)		0 (0%)	
In Cohort 3 & previous cohorts	0 (0%)		0 (0%)		0 (0%)	
Teach Regular Education	42 (89%)		67 (86%)		98 (88%)	
Teach Special Education (sole and inclusion)	4 (9%)		2 (3%)		6 (5%)	
Teach ELL, ESL, or Sheltered English Immersion			4 (5%)		4 (4%)	
Teach Elementary (all content areas)	20 (43%)		23 (30%)		39 (35%)	
Teach Elementary Math	8 (17%)		8 (10%)		13 (12%)	
Teach Mathematics Above Elementary	5 (11%)		11 (14%)		15 (14%)	
Teach Science or Technology/Engineering	22 (47%)		51 (65%)		64 (58%)	
Teaching in High Need District	31 (66%)		40 (51%)		61 (55%)	
Highly Qualified	19 (40%)		39 (50%)		54 (49%)	
Yes	22 (47%)		28 (36%)		43 (39%)	
No	6 (13%)		4 (5%)		7 (6%)	
In some, but not all areas	0 (0%)		3 (4%)		3 (3%)	
Cannot be determined	0 (0%)		4 (5%)		4 (4%)	
Private school/Not applicable	0 (0%)					
Have Passed One or More MTEL Exams	22 (47%)		42 (54%)		59 (53%)	
Hold One or More Teaching Licenses	45 (96%)		76 (97%)		107 (96%)	

Table 19. WPI – Science Participant Background Information (S)

	Number of Participants		Number of Participants		Number of Participants	
	Sep06 - Aug07		Sep07 - Aug08		TOTAL	
Total Number of Participants	19		13		30	
Participants Who Took Multiple Courses	0 (0%)		2 (15%)		2 (7%)	
In Cohort 3	0 (0%)		1 (8%)		1 (3%)	
In previous cohorts	0 (0%)		0 (0%)		0 (0%)	
In Cohort 3 & previous cohorts	0 (0%)		0 (0%)		0 (0%)	
Teach Regular Education	16 (84%)		10 (77%)		26 (87%)	
Teach Special Education (sole and inclusion)	0 (0%)		1 (8%)		1 (3%)	
Teach ELL, ESL, or Sheltered English Immersion			0 (0%)		0 (0%)	
Teach Elementary (all content areas)	4 (21%)		1 (8%)		5 (17%)	
Teach Elementary Math	0 (11%)		0 (0%)		0 (0%)	
Teach Mathematics Above Elementary	2 (0%)		2 (15%)		4 (13%)	
Teach Science or Technology/Engineering	14 (74%)		10 (77%)		23 (77%)	
Teaching in High Need District	3 (16%)		7 (54%)		13 (43%)	
Highly Qualified	5 (26%)		6 (46%)		11 (37%)	
Yes	10 (53%)		4 (31%)		13 (43%)	
No	0 (0%)		1 (8%)		1 (3%)	
In some, but not all areas	1 (5%)		2 (15%)		2 (7%)	
Cannot be determined	3 (16%)		0 (0%)		3 (10%)	
Private school/Not applicable	5 (26%)		5 (39%)		10 (33%)	
Have Passed One or More MTEL Exams	17 (89%)		12 (92%)		27 (90%)	
Hold One or More Teaching Licenses						

Table 20. Worcester Public Schools Participant Background Information (M)		
	Number of Participants	
	Sep06-Aug07	
Total Number of Participants	41	
Participants Who Took Multiple Courses	In Cohort 3	6 (15%)
	In previous cohorts	0 (0%)
	In Cohort 3 & previous cohorts	0 (0%)
Teach Regular Education	29	(71%)
Teach Special Education (sole and inclusion)	4	(10%)
Teach Elementary (all content areas)	32	(78%)
Teach Elementary Math	5	(12%)
Teach Mathematics Above Elementary	1	(2%)
Teach Science or Technology/Engineering	0	(0%)
Teach in High Need District	34	(83%)
Highly Qualified	Yes	17 (42%)
	No	16 (39%)
	In some, but not all areas	2 (5%)
	Cannot be determined	1 (2%)
	Private school/Not applicable	5 (12%)
Have Passed One or More MTEL Exams	16	(39%)
Hold One or More Teaching Licenses	38	(93%)

Cumulative Summary: All Cohorts over All Funding Periods

Overview of Partnerships, Budgets, Courses, and Participants

Table 21 provides an overview of partnership participation since the inception of the program.

Table 21. Overview of MMSP Partnership Participation						
		Funding Period				
		MMSP Year 1 <i>Feb04-Aug04</i>	MMSP Year 2 <i>Sep04-Aug05</i>	MMSP Year 3 <i>Sep05-Aug06</i>	MMSP Year 4 <i>Sep06-Aug07</i>	MMSP Year 5 <i>Sep07-Aug08</i>
Partnership Grouping	Cohort 1	Grant Year 1 EduTron/Fitchburg-Math Harvard-Math Lesley-Math MCLA-Science Salem-Math Springfield PS-Science Wareham PS-Math WPI-Math	Grant Year 2 EduTron/Fitchburg-Math Harvard-Math Lesley-Math MCLA-Science Salem-Math Springfield PS-Science Wareham PS-Math WPI-Math	Grant Year 3 EduTron/Fitchburg-Math Harvard-Math Lesley-Math MCLA-Science Salem-Math Springfield PS-Science Wareham PS-Math WPI-Math	Grant Year 3 Extension	
	Cohort 2		Grant Year 1 MCLA-Math PV STEMNET-Math	Grant Year 2 MCLA-Math PV STEMNET-Math	Grant Year 3 MCLA-Math PV STEMNET-Math	
	Cohort 3				Grant Year 1 EduTron/Lowell-Math/Sci EduTron/Fitchburg-Math Lesley-Math North Shore-Science PV STEMNET-Math/Sci Salem-Math SE/Cape-Science WPI-Science WPS-Math (discontinued)	Grant Year 2 EduTron/Lowell-Math/Sci EduTron/Fitchburg-Math Lesley-Math North Shore-Science PV STEMNET-Math/Sci Salem-Math SE/Cape-Science WPI-Science

Cohorts 1, 2, and 3 combined consisted of 19 partnerships, with 12 of the 19 partnerships offering mathematics professional development, five offering science professional development, and two offering professional development in both mathematics and science content. Specifically, Cohort 1 consisted of eight partnerships, with six of the eight partnerships offering mathematics professional development and two offering science professional development. Cohort 2 consisted of two partnerships, both offering mathematics professional development. Cohort 3 consisted of nine partnerships, with four of the nine partnerships offering mathematics professional development, three offering science professional development, and two offering professional development in both mathematics and science.

Table 22 shows the funding received by each partnership since the inception of the program. While some partnerships were awarded funding in more than one funding period, for evaluation purposes, a partnership was identified as a “new” partnership each time it received funding that resulted from a different competition. Table 22 shows the funding received by each partnership for each year of the program. Overall, partnerships have been awarded a total of \$8,296,546 since the inception of MMSP.

Table 22. Budgets: All Partnerships, All Funding Periods

Partnership	Feb04-Aug06	Sep06-Aug07	Sep07-Aug08	TOTAL
COHORT 1				
<i>Initially funded February 2004</i>				
EduTron (M)	\$770,000	\$68,352		\$838,352
Harvard Graduate School of Ed. (M)	\$489,899	\$87,425		\$577,324
Lesley University (M)	\$810,726	\$43,838		\$854,564
MCLA – Science (S)	\$133,192	\$38,247		\$171,439
Salem State College (M)	\$541,995	\$43,648		\$585,643
Springfield Public Schools (S)	\$500,044	\$74,737		\$574,781
Wareham Public Schools (M)	\$398,440	\$43,962		\$442,402
Worcester Polytechnic Institute (M)	\$601,778	\$35,633		\$637,411
COHORT 2				
<i>Initially funded September 2004</i>				
MCLA – Math (M)	\$111,494	\$51,874		\$163,368
UMass Amherst (M)	\$262,415	\$181,581		\$443,996
COHORT 3				
<i>Initially funded September 2006</i>				
EduTron Lowell (M/S)		\$210,000	\$220,000	\$430,000
EduTron Fitchburg (M)		\$102,000	\$110,000	\$212,000
Lesley University (M)		\$347,911	\$355,626	\$703,537
North Shore (S)		\$196,474	\$194,729	\$391,203
UMass Amherst (M/S)		\$107,424	\$216,281	\$323,705
Salem State College (M)		\$120,882	\$113,551	\$234,433
SE/Cape (S)		\$129,438	\$181,420	\$310,858
Worcester Polytechnic Institute (S)		\$99,586	\$70,734	\$170,320
Worcester Public Schools (M)		\$231,210		\$231,210
TOTAL	\$4,619,983	\$2,214,222	\$1,462,341	\$8,296,546

Over the span of MMSP, Cohort 1, 2, and 3 partnerships developed and implemented a total of 176 courses. Of those 176 courses, 100 (57%) were unique, and 76 (43%) were repeat offerings. Of the 176 courses, 129 (73%) of the courses offered mathematics content, 41 (23%) offered science content, five (3%) offered technology/ engineering content, and one (<1%) offered both mathematics and science content. This section of the report summarizes data collected from participants in these courses. In total, there were 1693 unique participants, and 641 of them took two or more courses. The term “unique participant” refers to each individual who participated in the program, regardless of how many courses he or she took. Data for items from the Participant Background Survey that help to convey participants’ professional backgrounds and motives for participation are discussed in the remainder of this section. In addition, this section discusses information obtained from partnerships on the extent to which courses offered through MMSP became institutionalized.

Position of Participants

At the time of their last completed survey from an MMSP course, 93% of course participants identified themselves as teachers. Of all respondents, 76% were regular education teachers; 14% were special education or special education inclusion teachers; 1% were ELL, ESL, or Sheltered English Immersion teachers; 2% were department heads or curriculum coordinators; 2% were principals, assistant principals, or headmasters; 1% were support specialists; 1% were paraprofessionals; <1% were long-term substitutes; <1% were superintendents or assistant superintendents; and 3% indicated that they held “other” positions.

Content Taught

The distribution of teaching areas of respondents at the time of the survey is shown in Table 23. Because respondents identified *all* teaching areas that applied to their positions at the time of the survey, some selected multiple responses, so frequency totals exceed the number of respondents and percentages exceed 100%. Also, figures reported in “Total” column may be smaller than figures for any individual year because the total is based on data from the last survey completed and some repeat participants changed teaching areas over the course of their participation.

At the time of their last MMSP course, 45% were teaching mathematics, 34% were teaching science, and 24% were teaching all subjects at the elementary level.

Table 23. Teaching Areas: All Participants, All Partnerships, All Funding Periods

Teaching Areas (Multiple responses permitted)	Total N = 1693	
	n	%
Mathematics	769	45%
Any science area	570	34%
<i>General Science</i>	279	17%
<i>Biology</i>	85	5%
<i>Earth Science</i>	54	3%
<i>Chemistry</i>	61	4%
<i>Physics</i>	60	4%
<i>Technology/Engineering</i>	31	2%
Elementary (all subjects)	402	24%
Elementary Mathematics	123	7%
Other	45	3%
Not Currently Teaching	121	7%

Types of Schools of Participants

For each funding period of the program, at least 96% of MMSP participants worked in a public school setting. Over the course of the program to date, 97% of MMSP participants worked in a public school setting, and 2% worked in a non-public school setting. Table 24 provides a breakdown, by funding period, of the types of schools in which participants worked. In addition, for the 2006-2007 year of funding (which included previous cohorts and the current cohort), details are broken down according to cohort membership.

Table 24. Types of Schools: All Unique Participants, All Funding Periods

School Type	Feb04- Aug04	Sep04- Aug05	Sep05- Aug06	Sep06- Aug07 Cohorts	Sep06- Aug07 Cohort 3	Sep07- Aug08 Cohort 3	Total

					1 & 2							
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Public Schools (includes public charter schools)	332	97	448	98	455	98	86	91	447	98	462	97
Non-public School	8	2	7	2	6	1	5	5	7	2	7	2
Other or No Response	1	<1	1	<1	3	1	4	4	4	<1	8	2
TOTAL	341	100	456	100	464	100	95	100	458	100	477	100

High Need Status of Districts of Participants

MMSP partnerships were required to include at least one high need district. Appendix D identifies the criteria for the high need designation. In addition, the ESE expected that at least 50% of participants in each partnership would come from high need districts, and further, they set an informal goal that at least 75% of participants for each partnership would come from high need districts. The high need status of some school districts changed across years. To classify participants from districts that were high need at one point in time but not high need at another, a process was used that took into account the high need status of participants' districts from the beginning of each partnership's MMSP involvement with the program. A district identified as high need in the first year of a partnership's funding continued to be classified as high need in subsequent years of the partnership, even if the district's status changed. Additionally, any districts not on the high need list in the first year of a partnership's funding but subsequently added to the high need list in later years of the partnership were then identified as qualifying for high need district designation.

As a whole, across all years of funding, 64% of participants were from high need districts. Table 25 shows that across all years of funding, 67% of the *public school participants* in the program as a whole had come from high need districts and that for each year of funding, over 50% of public school participants in the program had come from high need districts. An examination of high need district participation in individual partnerships reveals that over the course of each partnership's involvement in MMSP since the beginning of MMSP, 13 of the 19 partnerships had at least 50% of their participants coming from high need districts across all years of their involvement, and (again, across all years of their involvement) nine of 19 partnerships exceeded the informal goal of having at least 75% of the participants come from high need districts. If individual years of participation are examined, it is seen that ten of the 19 partnerships had at least 50% of their participants coming from high need districts for each and every year of funding, and eight of the 19 partnerships exceeded the informal goal of having at least 75% of the participants come from high need districts for each and every year of funding. The table in Appendix H shows the number of participants from high need districts organized by partnership.

As of their last course in MMSP, of the 641 individuals who took multiple courses, approximately 69% were from high need public school districts, approximately 29% were from other public school districts, and 2% either were from private schools or did not provide information on their districts. In addition, approximately 1% were from high need districts for some of the courses they took but not for others².

Table 25. High Need Status of All Unique Participants from Public Schools

² Teachers who took MMSP courses from a math partnership when their districts were considered high need for only science were identified as having come from a "non-high need" district, and teachers who took MMSP courses from a science partnership when their districts were considered high need for only math were identified as having come from a "non-high need" district.

School Type	Feb04-Aug04		Sep04-Aug05		Sep05-Aug06		Sep06-Aug07 Cohorts 1 & 2		Sep06-Aug07 Cohort 3		Sep07-Aug08 Cohort 3		Total	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
High Need District	202	61	276	62	254	56	54	63	343	77	335	73	1091	67
Non-High Need District	129	39	161	36	196	43	32	37	94	21	122	26	523	32
Other*	1	<1	11	2	5	1	0	0	10	2	5	1	27	2
TOTAL	332	100	448	100	455	100	86	100	447	100	462	100	1641	100

*Includes those who did not identify their districts and public school participants who took multiple courses whose districts were considered high need for only some of the courses those participants took.

Reasons for Participation in MMSP Courses

For each course taken, respondents identified all of their reasons for participating. Unlike in most other portions of this report where data were presented for unique participants, data for this issue are presented for all course seats, since responses are uniquely relevant to each distinct course that a participant took. Table 26 presents findings for all 3,290 seats for all courses taken by all participants across all funding periods.

Table 26. Reasons for Participation of Participants: All Seats, All Partnerships, All Funding Periods

Reasons for Participation (Multiple responses permitted)	Total	
	n	% of 3,290 course seats
To increase knowledge in content	2397	73%
To obtain graduate credit	2241	68%
To earn PDPs for recertification	1129	34%
To pursue a personal interest	1030	31%
To get an additional license (certification)	624	19%
To prepare for the Massachusetts Test for Educator Licensure (MTEL)	602	18%
To earn PDPs for HOUSSE plan requirement	331	10%
To follow an administrator's suggestion	228	7%
To obtain a first license (certification)	107	3%
Other	183	6%

Repeat Participation

Partnerships were very successful at encouraging and retaining repeat participants. Of the 19 partnerships, all offered multiple courses, and, of these, all had participants who attended more than one course. In all, 641 participants (38% of all participants) attended multiple courses. Of those participating in multiple courses, 79 took courses across partnerships. Table 27 provides details regarding repeat participation.

Table 27. Repeat Participants: All Partnerships, All Funding Periods

Partnership	Number of	Total Number	Number Taking	Number Taking	Total
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	Courses Delivered to Date	of Unique Participants to Date	Multiple Courses within Cohorts 1 & 2	Multiple Courses within Cohort 3	Number Taking Multiple Courses
EduTron (M)	7	128	36	0	54
Harvard (M)	8	166	24	0	26
Lesley Univ. C1 (M)	19	107	83	0	85
MCLA (S)	3	23	13	0	13
Salem State College (M)	26	162	59	0	81
Springfield PS (S)	7	96	41	0	43
Wareham PS (M)	3	43	12	0	12
WPI (M)	6	145	47	0	48
MCLA (M)	4	16	9	0	9
UMass Amherst (M)	11	76	39	0	52
EduTron Lowell (M/S)	6	113	0	24	24
EduTron Fitchburg (M)	4	79	0	24	45
Lesley Univ. C3 (M)	23	163	0	92	96
North Shore (S)	18	90	0	29	31
UMass Amherst C3 (M/S)	9	93	0	14	29
Salem State C3 (M)	8	78	0	25	46
SE/Cape (S)	9	110	0	40	41
WPI (S)	2	30	0	2	3
Worcester PS(M)	3	40	0	5	5
Across All Partnerships	176	1693	386	255	641

Highly Qualified Status

To comply with the federal No Child Left Behind legislation, public school teachers were required to meet the federal definition of highly qualified by the end of the 2005-2006 school year. One of the expectations of the MMSP is that providing high quality professional development would contribute to teachers' attainment of federal highly qualified status.

Information regarding the following areas was used to determine participants' highly qualified status: licensure, years in education, subject areas taught, High Objective Uniform State Standard of Evaluation (HOUSSE) plans held, Professional Development Points (PDPs) held, MTELs passed, degrees held, undergraduate degree equivalents, and advanced or national certifications.

To be considered highly qualified, a teacher must be licensed and demonstrate subject matter competency in the areas of teaching. Demonstration of subject matter competency for elementary teachers was satisfied either by passing the appropriate MTEL (general curriculum MTEL if teaching multiple core subjects or elementary math MTEL if teaching mainly elementary math) or by having a HOUSSE plan and having earned a particular number of PDPs. (The HOUSSE plan option was phased out in 2007.) Demonstration of subject matter competency for middle and secondary school teachers was satisfied by one of the following means: passing the appropriate MTEL, completing an appropriate undergraduate major or graduate degree, completing appropriate coursework comparable to an undergraduate major, holding advanced or national certification in the appropriate subject area, or by having a HOUSSE plan and having earned a particular number of PDPs. For all teachers with HOUSSE plans, the minimum numbers of PDPs needed varied in relation to the date of June 30, 2006: Prior to June 30, 2006, the minimum was 48, and following June 30, 2006, the minimum was 96. Appendix F outlines options available for demonstrating subject matter competency.

A participant was identified as highly qualified if the criteria for meeting highly qualified status were met for all subjects that a participant taught. If a participant taught multiple subject areas and only met the highly qualified criteria for some of the subjects taught, he or she was determined to be “highly qualified in some, but not all” content areas.

In the first MMSP funding period, the Participant Background Survey did not adequately capture information about teachers that could be used to determine highly qualified status. The survey was re-designed for Year 2 to capture this information. For the second and subsequent funding periods, though, survey responses indicated that participants misunderstood the meaning of HOUSSE plans, and some who completed more than one survey reported inconsistent data across surveys.

The Participant Background Survey permitted determination of the impact of MMSP courses on highly qualified status only for 1) those participants who held HOUSSE plans and 2) those participants who took more than one course (i.e., completed more than one survey). Because surveys were administered after participants had completed MMSP courses, if a participant completed only one course and did not have a HOUSSE plan it was not possible to determine whether that participant became highly qualified prior to or as a result of MMSP course participation.

Over the span of the program for all Cohorts, at least 133 participants attained highly qualified status. Table 28 presents the highly qualified status of participants across all years of the program. This table provides an unduplicated count of participants. Because the number of courses a participant took was relevant to the process used to determine how many participants attained highly qualified status while participating in MMSP, the findings are organized according to number of courses taken (only one vs. multiple). In Appendix I, a more detailed version of the table is presented in which the data are further broken down by cohort of participation.

Table 28. Highly Qualified Status of All Unique Participants: All Funding Periods			
Status	Took Only One Course <i>n</i> = 1052	Took Multiple Courses <i>n</i> = 641	TOTAL <i>n</i> = 1693
Became Highly Qualified	14	119	133
Became Highly Qualified in only some content areas	0	5	5

Highly Qualified (unable to determine when became HQ)	517	281	798
Highly Qualified in some content areas but not all (unable to determine when became HQ)	41	24	65
Not Highly Qualified	274	112	386
Private school or not teaching	86	54	140
Unknown	120	46	166

MTEL Information

One method by which teachers may demonstrate subject-matter competency is to pass the Massachusetts Tests for Educator Licensure (MTEL) in the content areas that they teach. Table 29 cumulatively identifies the tests taken by public school teachers across all years of the program along with passage rates. Of the 641 participants taking multiple courses, 26% earned one or more new licenses by the end of the fifth year of MMSP, and 12% took and passed an MTEL test. In addition, 2% of these participants learned that they had passed an MTEL that they had taken during a prior MMSP course.

As shown in Table 29, based on data from the last survey completed by each participant, of the 160 participants who had taken the Mathematics MTEL, 119 (74%) reported passing the test, and 14 (9%) had not yet received their scores at the time of survey completion. Of the 261 respondents who had taken the Middle School Mathematics MTEL, 309 (86%) passed and 17 (6%) had not yet received their scores. Of the 54 participants who completed the Middle School Mathematics/Science MTEL, 35 (65%) passed and seven (13%) had not yet received their scores. Of the 110 participants completing the General Science MTEL, 103 (94%) passed and three (3%) had not yet received their scores. Forty-two respondents attempted the Biology MTEL, and 36 (86%) passed and one had not yet received the score. Of the 21 participants who took the Chemistry MTEL, 20 (95%) passed. Of the nine who took the Earth Science MTEL, seven (78%) passed. Fifteen participants attempted the Physics MTEL, and 10 (67%) passed. Six individuals completed the Technology/Engineering MTEL, and four (67%) passed. Of the 228 participants who reported taking General Curriculum (formerly elementary) MTEL, 219 (96%) reported passing, and three had not yet received the score.

Table 29. MTEL Tests Taken by All Participants – Total to Date								
Based on each participant's last survey								
	Taking Test		Passing Test		Failing Test		Scores Unknown	
	<i>n</i>		<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
General Curriculum (formerly Elementary)	228		219	96	6	3	3	1
Early Childhood	15		13	87	2	13	0	0
Elementary Mathematics	44		35	80	4	9	5	11
Mathematics	160		119	74	27	17	14	9
Middle School Mathematics	309		265	86	27	9	17	6

Middle School Mathematics/Science	54	35	65	12	22	7	13
General Science	110	103	94	4	4	3	3
Biology	42	36	86	5	12	1	2
Chemistry	21	20	95	1	5	0	0
Physics	15	10	67	1	7	4	27
Earth Science	9	7	78	2	22	0	0
Technology/Engineering	6	4	67	2	33	0	0
TOTAL in STE Areas	257	215	84	27	11	15	6

Licensure and Degrees Held in Content Area Taught

Over the course of the program, 375 regular education teachers, 42 special education teachers, and 10 ELL teachers reported teaching in science or technology/engineering areas. Tables 30a, 30b, and 30c show how many teachers taught in each science and technology/engineering area over the course of the program. The tables also show the percentages of teachers whose survey responses indicated they were licensed in the area in which they taught, and they show the percentages of teachers whose survey responses indicated they held a degree in the area in which they taught. Table 30a provides information for regular education teachers, Table 30b provides information for special education teachers, and Table 30c provides information for ELL teachers. (The numbers presented in Tables 30a, 30b, and 30c exceed the number of teachers who reported teaching in these areas because some teachers taught in more than one area.) For regular education teachers, the licensing reported by approximately 49% appeared to be appropriate for the content area taught, and the degrees held by approximately 25% corresponded to content area taught. For special education teachers, the licensing reported by approximately 23% appeared to be appropriate for the content area taught, and the degree held by one teacher (2%) corresponded to content area taught. For ELL teachers, the licensing reported by approximately 31% appeared to be appropriate for the content area taught, and the degrees held by 38% corresponded to content area taught.

Table 30a. Science and Tech/Engineering Teaching Areas of All Participants – Regular Education

Content Area	Total		
	Teach in Area	License in Area Taught	Degree in Area Taught
	<i>n</i>	%*	%*
General Science	236	54%	16%
Biology	67	72%	67%
Chemistry	55	51%	31%
Earth Science	43	16%	14%
Physics	54	33%	19%
Technology/Engineering	29	28%	14%

*Of the number of regular education participants teaching in this area across all program years

Table 30b. Science and Tech/Engineering Teaching Areas of All Participants – Special Education

Content Area	Total		
	Teach in Area <i>n</i>	License in Area Taught % *	Degree in Area Taught % *
General Science	31	16%	3%
Biology	14	14%	0%
Chemistry	5	60%	0%
Earth Science	9	22%	0%
Physics	3	67%	0%
Technology/Engineering	0	0%	0%

*Of the number of special education participants teaching in this area across all program years

Table 30c. Science and Tech/Engineering Teaching Areas of All Participants – ELL Education

Content Area	Total		
	Teach in Area <i>n</i>	License in Area Taught % *	Degree in Area Taught % *
General Science	8	25%	13%
Biology	2	50%	100%
Chemistry	1	100%	100%
Earth Science	2	0%	50%
Physics	1	0%	100%
Technology/Engineering	2	50%	0%

*Of the number of ELL participants teaching in this area across all program years

By the end of the 2007-2008 funding period, 637 regular education teachers, 110 special education teachers, and nine ELL teachers reported teaching non-elementary level mathematics. Tables 31a, 31b, and 31c show how many teachers taught at each non-elementary mathematics level over the course of the program. The tables also show the percentages of teachers whose survey responses indicated they were licensed in the level at which they taught, and they show the percentages of teachers whose survey responses indicated they held a degree in the area in which they taught. Table 31a provides information for regular education teachers, Table 31b provides information for special education teachers, and Table 31c provides information for ELL teachers. For regular education teachers, the licensing reported by approximately 72% appeared to be appropriate for the mathematics level taught, and the degrees held by 19% corresponded to content area taught. For special education teachers, the licensing reported by approximately 22% appeared to be appropriate for the level taught, and the degrees held by three teachers (3%) corresponded to content area taught. For ELL teachers, the licensing reported by three teachers (33%) appeared to be appropriate for the level taught, and the degree held by one teacher corresponded to content area taught.

Table 31a. Mathematics Teacher Levels of All Participants – Regular Education

Content Area	Total
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	Teach in Area <i>n</i>	License in Area Taught %*	Degree in Area Taught %*
Middle School	537	71%	16%
High School	91	79%	41%
MS & HS grades	9	44%	22%
TOTAL Math	637	72%	19%

*Of the number of regular education participants teaching in this area for this year

Table 31b. Mathematics Teacher Levels of All Participants – Special Education			
Content Area	Total		
	Teach in Area <i>n</i>	License in Area Taught %*	Degree in Area Taught %*
Middle School	90	23%	3%
High School	17	18%	0%
MS & HS grades	3	0%	0%
TOTAL Math	110	22%	3%

*Of the number of special education participants teaching in this area for this year

Table 31c. Mathematics Teacher Levels of All Participants – ELL Education			
Content Area	Total		
	Teach in Area <i>n</i>	License in Area Taught %*	Degree in Area Taught %*
Middle School	8	38%	0%
High School	1	0%	100%
MS & HS grades	0	0%	0%
TOTAL Math	9	33%	11%

*Of the number of ELL participants teaching in this area for this year

Degrees Currently Pursued

Information on degrees currently being pursued in science, technology/engineering, and mathematics was derived from the most recently completed survey of each individual. Of the 375 regular education teachers, 42 special education teachers, and ten ELL teachers over the course of the program who reported teaching in science or technology/engineering areas, 15 were pursuing science degrees in their current areas of teaching: 11 general science teachers were pursuing master's degrees in general science, one general science teacher was pursuing a master's degree and a CAGS degree in

general science, one teacher of biology and general science was pursuing a master's degree in biology, one general science teacher was pursuing a bachelor's degree in general science, and one physics teacher was pursuing a master's degree in physics. Additionally, five science teachers were pursuing degrees in areas of science they did not currently teach: One who taught earth science was pursuing a master's in general science, two who taught general science were pursuing master's degrees in biology, and another who taught physics was pursuing a master's in general science.

Of the 637 regular education teachers, 110 special education teachers, and nine ELL teachers over the course of the program who reported teaching non-elementary level mathematics, 16 were pursuing degrees in mathematics: one middle school and high school teacher, four high school teachers, and eight middle school mathematics teachers were pursuing master's degrees; one high school teacher was pursuing a bachelor's degree, and one middle school and one high school mathematics teacher each were pursuing a CAGS.

Course Institutionalization

For systemic change to occur at the higher education institutions, departments of arts and sciences and education departments are encouraged to work together through MMSP to support stronger content courses in mathematics and science for teacher preparation, undergraduate and graduate degree requirements, and for in-service teachers pursuing graduate-level content courses for recertification. Integration of Title IIB courses into graduate programs at Institutes of Higher Education ensures sustainability over time. The intent behind encouraging the partnerships is that the faculty from the Arts and Sciences Departments bring strong content expertise to the partnership table. This integration creates greater opportunities for participants to complete coursework leading to a content-area degree and/or to licensure along with the highly qualified designation.

Asked to describe activities during the 2006–2007 and 2007-2008 funding periods related to the institutionalization of their courses, all nine partnerships in Cohort 3 evinced integration, plans for future integration, or – in the case of partnerships with previously established involvement with MMSP – work toward sustaining prior integration. As would be expected in a program involving partnerships with diverse structures and styles, the extent and type of integration varied across partnerships. To convey a sense of how integration occurred, following are significant activities, grouped according to partnership:

EduTron Lowell Public Schools (M/S) and EduTron Fitchburg State College (M)

- Two remedial courses, based on the EduTron model for MMSP courses, will continue to be offered at Fitchburg State College (FSC). EduTron partners supported FSC in designing three pre-service courses that are optimized for education majors. EduTron has begun working with FSC to help FSC apply the EduTron model used in MMSP math courses to science courses.
- FSC has partnered with Lowell Public Schools to offer a teacher certification/CAGS program.
- Four mathematics and two science courses were approved by FSC as offerings at the continuing education level.

Lesley University C3 (M)

- Two courses created through Lesley University's MMSP in 2007-2008 are now offered to Lesley's on-campus pre-service teachers.
- Efforts through MMSP contributed to the development of an online Mathematics Education program at Lesley leading to the Master of Arts degree for elementary and middle school teachers.
- Nine math content courses were developed through participation in the MMSP program in 2007-2008 and in prior years. All of these courses are part of Lesley University's mathematics major for undergraduates, which would not have been possible without the MMSP program.

North Shore (S)

- As a result of their joint involvement in MMSP through the North Shore partnership and the National Science Foundation MSP program, Northeastern University has institutionalized all MMSP courses. Eight MMSP courses can be used to fulfill 80% of the degree requirements toward a Master's in Education for Middle School Science. In addition, this degree was developed as a result of these courses.

UMass Amherst C3 (M/S)

- Four courses developed through the UMass Amherst partnership were approved for graduate level credit.

Salem State C3 (M)

- Salem State College offers courses developed through MMSP as part of a master's level teaching program in middle school mathematics. All courses developed by Salem State College through MMSP can be applied towards earning a degree through that program. (This approach had been developed through Salem State College's prior participation MMSP.)

Southeast/Cape (S)

- Participants of the three courses offered through the SE/Cape partnership may apply credit for the courses towards the Master of Arts in Teaching in Physical Science program that is offered through Bridgewater State College.

Worcester Polytechnic Institute (S)

- A Master of Science Education program was created through the physics department at Worcester Polytechnic Institute, and the MMSP course that was offered through the WPI-Science partnership will serve as the model for instruction of future courses that will be offered.

Worcester Public Schools (M)

- As a result of the experience of working with Worcester Public Schools on MMSP, Clark University has expressed interest in exploring the institutionalization of courses that were offered through MMSP.

Summary of Findings

The MMSP partnership activities summarized in this section of the report occurred between February 2, 2004, and August 31, 2008. This period spans the beginning of the MMSP program through the end of the 2007-2008 funding period.

Since MMSP began in February 2004, progress has been made towards meeting the goals of the program as evidenced by the following data for both the program as a whole, since its inception, and for the most recent cohort, Cohort 3.

Cumulative Findings

Overview of Partnerships, Courses, and Participants

- A total of 19 partnerships were funded across the Commonwealth. Of these, 12 were organized around mathematical content, five were organized around science content, and two were organized around both mathematical and science content. Of the 19 MMSP partnerships, all delivered courses, all offered multiple courses, and all had participants who attended more than one course.
 - Cohort 1 consisted of eight partnerships, with six of the eight partnerships offering mathematics professional development and two offering science professional development.
 - Cohort 2 consisted of two partnerships, both offering mathematics professional development.
 - Cohort 3 consisted of nine partnerships, with five of the nine partnerships offering mathematics professional development, three offering science professional development, and one offering professional development in both mathematics and science content.
- In total, 176 MMSP courses were delivered by the end of Year 5 of MMSP funding. Of these 176 courses, 129 were mathematics courses, 41 were science courses, five were technology/engineering courses, and one was a course offering both mathematics and science content.
- In total, 1693 unique participants participated in MMSP courses by the end of Year 5.
 - 641 participants (38% of all participants) attended multiple courses. Of the 641 participating in multiple courses, 79 took courses across partnerships.
 - 3,290 course seats were filled by all participants across all funding periods.

Reaching Targeted Participants

- Types of Schools of Participants
 - Of all 1693 unique participants, 97% came from public schools (including public charter schools), 2% came from non-public schools, and 1% did not indicate their school type.
- High Need Status of Districts of Participants
 - The partnerships exceeded the ESE target of having at least 50% of all participants come from high need districts, with 64% of all participants in the program coming from high need districts.

- Across all years of their involvement, 13 of the 19 partnerships had at least 50% of their participants coming from high need districts.
- For each and every individual year of funding, ten of the 19 partnerships had at least 50% of their participants coming from high need districts.
- Across all years of their involvement, nine of 19 partnerships had at least 75% of the participants come from high need districts.
- For each and every individual year of funding, eight of the 19 partnerships had at least 75% of the participants come from high need districts.

As the following data reveal, not all MMSP participants were licensed in their teaching areas or held relevant degrees, indicating that course participants were, in fact, those in need of the courses:

- Licensure in Mathematics and Science Content Areas for Middle and High School Teachers
 - Of the regular education mathematics courses taught by MMSP teachers, 72% were taught by teachers who were licensed in mathematics.
 - Of the special education mathematics courses taught by MMSP teachers, 22% were taught by teachers who were licensed in mathematics.
 - Of the ELL mathematics courses taught by MMSP teachers, 33% were taught by teachers who were licensed in mathematics.
 - Of regular education science or technology/engineering courses taught by MMSP teachers, 49% were taught by teachers who were licensed in the subject of the course.
 - Of special education science or technology/engineering courses taught by MMSP teachers, 23% were taught by teachers who were licensed in the subject of the course.
 - Of ELL science or technology/engineering courses taught to students of MMSP teachers, 31% were taught by teachers who were licensed in the subject of the course.
- Degrees Held in Content Area in which Teaching
 - Of regular education mathematics courses taught by MMSP teachers, 19% were taught by teachers who held mathematics degrees.
 - Of special education mathematics courses taught by MMSP teachers, 3% were taught by teachers who held mathematics degrees.
 - Of ELL mathematics courses taught to students of MMSP teachers, 11% were taught by teachers who held mathematics degrees.
 - Of regular education science or technology/engineering courses taught by MMSP teachers, 25% were taught by teachers who held degrees that were relevant to the focus of the course.
 - Of special education science or technology/engineering courses taught by MMSP teachers, 2% were taught by teachers who held degrees that were relevant to the focus of the course.

- Of ELL science or technology/engineering courses taught by MMSP teachers, 38% were taught by teachers who held degrees that were relevant to the focus of the course.

Highly Qualified Status

MMSP has contributed to increasing the numbers of highly qualified public school teachers.

- Attaining Highly Qualified Status
 - By the end of Year 5, of the participants who had entered MMSP as not highly qualified, 133 had attained highly qualified status.
- New Licensures
 - Of the 641 participants taking multiple courses, 26% earned one or more new licenses by the end of the fifth year of MMSP, and 12% took and passed an MTEL test.

Cohort 3 Findings

Overview of Partnerships, Courses, and Participants

- Nine Cohort 3 partnerships were funded through the 2007-2008 funding period. Of these, four were organized around mathematical content, three were organized around science content, and two were organized around both mathematical and science content. Of the nine Cohort 3 MMSP partnerships, all delivered courses. Of the nine partnerships, all offered multiple courses, and all had participants who attended more than one course.
- In total, 82 Cohort 3 courses were delivered by the end of Year 5 of MMSP funding. (Plus one additional course was offered in conjunction with a program with a different funding source, but there were no MMSP participants.) Of these 82 courses, 44 were mathematics courses, 34 were science courses, three were technology/engineering courses, and one was a course offering both mathematics and science content.
- By the end of Year 5, 797 unique Cohort 3 participants participated in MMSP courses.
 - 255 participants (32% of all Cohort 3 participants) attended multiple courses across the 2006-2007 and 2007-2008 years.
 - 296 participants (37% of all Cohort 3 participants) attended multiple courses across all MMSP funding periods.
 - 1333 course seats were filled by Cohort 3 participants across 2006-2007 and 2007-2008.
 - Course attrition rates were generally low, averaging 5% across Cohort 3 courses.

Reaching Targeted Participants

- Types of Schools of Participants
 - Of all 797 unique Cohort 3 participants, 97% came from public schools (including public charter schools), and 2% came from non-public schools.
- High Need Status of Districts of Participants
 - The Cohort 3 partnerships exceeded the ESE target of having at least 50% of all participants come from high need districts, with 73% of all Cohort 3 participants in the program coming from high need districts.
 - Six of the nine partnerships had at least 50% of their participants coming from high need districts.
 - Five of the nine partnerships had at least 75% of the participants come from high need districts.

As the following data reveal, not all Cohort 3 participants were licensed in their teaching areas or held relevant degrees, indicating that course participants were, in fact, those in need of the courses:

- **Licensure in Mathematics and Science Content Areas for Middle and High School Teachers**
 - Of regular education mathematics courses taught by Cohort 3 teachers, 76% were taught by teachers who were licensed in mathematics.
 - Of special education mathematics courses taught by Cohort 3 teachers, 28% were taught by teachers who were licensed in mathematics.
 - Of ELL mathematics courses taught by Cohort 3 teachers, 17% were taught by teachers who were licensed in mathematics.
 - Of regular education science or technology/engineering courses taught by Cohort 3 teachers, 61% were taught by teachers who were licensed in the subject of the course.
 - Of special education science or technology/engineering courses taught by Cohort 3 teachers, 41% were taught by teachers who were licensed in the subject of the course.
 - Of ELL science or technology/engineering courses taught by Cohort 3 teachers, 50% were taught by teachers who were licensed in the subject of the course.
- **Degrees Held in Content Area in which Teaching**
 - Of regular education mathematics courses taught by Cohort 3 teachers, 19% were taught by teachers who held mathematics degrees.
 - Of special education mathematics courses taught by Cohort 3 teachers, 4% were taught by teachers who held mathematics degrees.
 - Of ELL mathematics courses taught by Cohort 3 teachers, 17% were taught by teachers who held mathematics degrees.
 - Of regular education science or technology/engineering courses taught by Cohort 3 teachers, 28% were taught by teachers who held degrees that were relevant to the focus of the course.
 - Of special education science or technology/engineering courses taught by Cohort 3 teachers, 3% were taught by teachers who held degrees that were relevant to the focus of the course.
 - Of ELL science or technology/engineering courses taught by Cohort 3 teachers, 13% were taught by teachers who held degrees that were relevant to the focus of the course.

Highly Qualified Status

MMSP has contributed to increasing the numbers of highly qualified public school teachers.

- **Attaining Highly Qualified Status**
 - By the end of the 2007-2008 funding period, of the Cohort 3 participants who had entered MMSP as not highly qualified, 23 had attained highly qualified status.

Content Knowledge Gains

The content knowledge of Cohort 3 participants was increased:

- Statistically significant improvements in scores on content knowledge assessments occurred in 74 of the 82 Cohort 3 courses.
- Gains in average percentage of items correct between pre- and post-course test administrations occurred in all 82 of the 82 courses delivered across all Cohort 3 partnerships

Integrating Courses into Higher Education Institutions

Integration or plans for future integration of courses into institutions of higher education occurred within all Cohort 3 partnerships.