Massachusetts Race to the Top College and Career Readiness Initiatives

Evaluation Annual Report, September 2013

Prepared for the Massachusetts Department of Elementary and Secondary Education

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# Acknowledgments

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Massachusetts Race to the Top College and Career Readiness Initiatives

**Evaluation Annual Report, September 2013**

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**Report Information**

This report was prepared by the UMass Donahue Institute, the project evaluator, under contract with the Massachusetts Department of Elementary and Secondary Education.

**About the Donahue Institute**

The University of Massachusetts Donahue Institute is the public service, outreach, and economic development unit of the University of Massachusetts President’s Office. Established in 1971, the Institute strives to connect the Commonwealth with the resources of the University through services that combine theory and innovation with public and private sector applications.

UMDI’s Applied Research and Program Evaluation group specializes in applied social science research, including program evaluation, survey research, policy research, and needs assessment. The group has designed and implemented research and evaluation projects for diverse programs and clients in the areas of education, human services, economic development, and organizational development.

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# Executive Summary

The Massachusetts Department of Elementary and Secondary Education (ESE) was awarded a federal Race to the Top (RTTT) grant for the years 2010–2014. The college and career readiness (C&CR) components of the grant were designed to help students develop “knowledge and skills necessary for success in postsecondary education and economically viable career pathways.” The RTTT initiatives are intended to provide students with opportunities to participate in quality, upper-level high school coursework and new approaches to assist them with high school completion and transition to higher education and the workforce. These programs are part of a broader effort, as specified in the Delivery Plan of ESE's College and Career Readiness group, to increase the Massachusetts 5-year high school graduation rate to 88.3% and the number of students who complete the MassCore program of study to 85% statewide.

The UMass Donahue Institute is conducting an evaluation of three of the C&CR components of the Massachusetts RTTT efforts—the Pre-AP Teacher Training program, the STEM-focused Early College High Schools (ECHS), and the MassCore Policy and Implementation initiative. For each of these three programs, this executive summary provides a brief program description, evaluation findings for the period ending September 30, 2013 (referred to as Year 3), and strategic considerations.

The annual report consists of UMDI’s January, June, and September 2013 interim evaluation reports, as well as this executive summary, which spans all three reports. The annual report has two companion files. First, the file entitled *Technical Supplement, RTTT C&CR Evaluation 2013, Graduation Rates* is a spreadsheet that presents a more complete summary of graduation data by school and district. Second, the file entitled *Technical Supplement, RTTT C&CR Evaluation 2013, MassCore Completion Rates* is a spreadsheet that presents a more complete summary of MassCore completion rates by district.

**Pre-AP Teacher Training**

The aims of the Pre-AP Teacher Training program are to increase the number of low-income and minority students prepared to participate and succeed in mathematics, science, and English language arts (ELA) Advanced Placement courses and credit-bearing college-level coursework; to provide teachers in grades 6-12 with high-quality professional development to assist them in developing curricula, instruction, and assessments that prepare students for AP coursework; and to provide an opportunity for teachers to collaborate in horizontal and vertical teams and to network with other teachers in their region for the purpose of improving curriculum and instruction. Technical assistance for the project has been based on the Laying the Foundation (LTF) curriculum and provided by the Massachusetts Math + Science Initiative (MMSI).

Districts are participating in the program in multiple configurations. RTTT Goal 4D districts committed to sending the same teachers for four-day trainings in three consecutive summers and to create discipline-specific vertical teams, led by trained lead teachers, that meet quarterly to share and deepen their Pre-AP practices. Districts that are using Goal 4A or non-RTTT funds have created several variations of the basic training configuration, and the percentage of all teachers in a given school and district who are being trained varies widely. Districts also selected different disciplines or combinations of disciplines among the mathematics, science, and English language arts (ELA) trainings offered.

The Year 3 evaluation of the Pre-AP initiative included the following activities: site visits to 3 Goal 4D schools which included 12 interviews with teachers and administrators, 3 classroom observations, and 2 vertical team meeting observations; surveys of teachers, lead teachers, and administrators; regular communications and an in-person interview with ESE program managers; 2 phone interviews with the MMSI program director; and collection of vertical team meeting attendance from Goal 4D districts. Additional data sources included MMSI’s training registration and attendance database, ESE documents and databases, and project documents.

**Teachers trained and schools served.**Through the end of the 2012–13 school year, 1,152 teachers had completed at least 3 days of Pre-AP training. Of those teachers, 43% were trained in ELA, 36% in mathematics, and 21% in science. The RTTT Pre-AP goal of training 1,000 teachers has therefore been exceeded by 15%.

Administrators and lead teachers from Project 4D districts also participated in trainings specific to their roles. Half of the 42 Project 4D districts have had at least one administrator attend administrator training, and 74% (N=31) have had at least one teacher attend lead teacher training. The 74% figure overestimates the participation by disciplinary teams, because some 4D districts are participating in training in more than one discipline, and the 42 Project 4D districts include a total of 81 disciplinary teams.

ESE also proposed a goal to provide Pre-AP training to teachers in at least 65 schools serving low-income communities in Massachusetts. As of January, 2013, ESE exceeded that goal by 48%, as teachers from 96 schools in the lowest income quartile of the state, including 56 schools from Project 4D districts have received training.

**Vertical teaming.** According to the program’s guidelines, each 4D district will create discipline-specific vertical teams of Pre-AP trained and other teachers, led by a Pre-AP trained lead teacher, that will meet quarterly to share and deepen their Pre-AP practices. The number of vertical team meetings is one indicator of a district’s level of Pre-AP implementation. During Year 3, 75% of 4D districts submitted vertical team meeting attendance logs. Of those districts, 70% submitted data for 4 meetings, 17% submitted data for 3 meetings, and 13% submitted data for 2 meetings.

During interviews with teachers and administrators from three districts, almost all reported advantages and successes of vertical team meetings. They appreciated the opportunity to spend time with their colleagues, meet colleagues from other schools, share resources, and strategize about how to implement LTF activities effectively. Making connections between middle and high school teachers was often mentioned, particularly the benefits of understanding each other’s responsibilities and challenges. Reported challenges of vertical team meetings included time and logistics.

**Classroom implementation.** The teacher survey was sent to 1,253 teachers and 40% (n=429) responded. The administrator survey was sent to 38 administrators and 55% (n=21) responded. Most teachers indicated that, as a result of the Pre-AP program, their awareness of the importance of using Pre-AP strategies had increased (83%), they had increased content knowledge in their primary discipline (71%), they teach more Pre-AP content (75%), and they use more Pre-AP pedagogical strategies (74%). A majority of teachers reported that, as a result of the Pre-AP program, they use more Pre-AP assessment strategies (54%), their personal teaching philosophy had changed to be more consistent with that of the Pre-AP program (54%), and implementing the LTF lessons and/or assessments represented a substantial change in their teaching practice (49%). Furthermore, 100% of administrators indicated that they fully support the integration of Pre-AP lessons and assessments in their school/district’s curriculum.

Interviewed teachers reported having conducted from 5–20 LTF lessons per year, and that they typically implemented more LTF lessons than expected by their district. Some added that they taught more LTF lessons in their “honors” classes than in their “standard” classes. Most teachers interviewed said that implementing LTF lessons with students of lower academic ability required more scaffolding and modification of materials, but that they engaged in LTF activities with their students at all levels.

During three classroom lessons, UMDI observed that teachers incorporated many elements of LTF’s pedagogical approach, although they did so to varying degrees, and some lessons seemed more conducive to LTF’s approach than others. For example, more active inquiry and student collaboration was evident in the observed physics lab, where students were engaged in a hands-on activity, than in the observed mathematics class, where students were focused on a more independent worksheet-based task.

**AP course and exam participation and success.** Based on ESE’s definition of “high-needs” (HN) students, non-high-needs (NHN) students take and pass AP courses at three to four times the rate of high-needs (HN) students statewide. However, this ratio is substantially lower in Project 4D districts for mathematics (2.7 versus 3.5) and science (2.8 versus 3.8) but not for ELA (2.9 versus 2.8). The highest percentage of HN students taking and passing AP courses can be found in Project 4D districts that also have AP programs present. Quantitative analyses in Year 4 will further explore the extent to which the Pre-AP program may influence these outcomes.

NHN students take AP exams in ELA, math, and science on average three to four times the rate of HN students. Again, the Pre-AP program appears to be related to trends in AP exam success, as these ratios are substantially lower in Project 4D districts for mathematics (3.9 versus 2.9) and science (4.3 versus 2.7) but not for ELA (3.1 versus 3.2). Furthermore, the ratios are substantially lower in all three disciplines for the districts that began the Pre-AP program in the first cohort and have had longer exposure to the program. Again, quantitative analyses in Year 4 will further explore the extent to which the Pre-AP program may influence these outcomes.

**Training and technical assistance.** Several survey items address perceptions of the quality and availability of program materials and technical assistance. With regard to program quality, 88% of teachers and 100% of administrators believe that the LTF lessons and assessments are examples of high-quality pedagogical practices. Furthermore, 86% of teachers and 100% of administrators believe that the LTF lessons and assessments are well aligned with the Common Core State Standards. Sixty-eight percent of teachers agreed or strongly agreed that they had access to adequate curricular resources to implement Pre-AP lessons and/or assessments. Finally, the majority of teachers (76%) and administrators (81%) agreed that they have been satisfied with the support they have received from MMSI.

Interviews with teachers and administrators complement these survey findings, as most interviewees spoke highly of the MMSI summer training and support in facilitating vertical team meetings. Teachers and administrators were asked on both the survey and during interviews about additional needs for training and technical assistance. Teachers requested more scaffolding strategies and lessons to work more effectively with ELLs, students with special needs, and students with lower academic ability levels. They also requested support for tailoring lessons when not all materials are available. Administrators requested training or support that would help them better support their teachers’ implementation of Pre-AP activities, as well as how they could more effectively observe and support teachers in service of program implementation.

**Feedback from ESE and MMSI.** UMDI interviewed program managers from ESE and MMSI regarding program successes, challenges, sustainability, and recent program developments. ESE reported that more teachers were trained during the summer of 2013 than in the previous two summers combined, and that ESE was able to offer additional funding to train teachers from Level 2–4 schools. MMSI reported that new, non-RTTT districts had inquired about receiving training, which MMSI believed was because these districts had heard that the training was of high quality and value. MMSI also reported that RTTT Goal 4A funds were made available to some districts to purchase technology tools, and that MMSI arranged for two private technology companies to make presentations about key technology tools during vertical team meetings in several districts.

ESE’s greatest reported challenge was that MMSI will no longer be able to utilize the LTF curriculum, as a result of an impasse between MMSI’s parent organization (Massachusetts Insight Education) and the organization that controls the LTF curriculum and trainings (the National Math and Science Initiative, or NMSI). Following this development, MMSI’s two primary Pre-AP program administrators were hired by NMSI and left MMSI. Nonetheless, MMSI wanted to continue to be the Pre-AP program vendor and proposed offering a different curriculum to replace LTF. ESE was concerned that this would be disruptive to teachers and districts that had already worked deeply with LTF and incorporated it into their classrooms and curriculum frameworks, and that were well known and understood by the MMSI personnel who are now working at NMSI. At the time of this report, the ESE program manager believed that districts will have the option to work with an appropriate vendor of their choice. This would enable them either to continuing working with MMSI, or to switch to NMSI and continue working with the LTF and the former MMSI personnel who are now at NMSI.

Another challenge included the observation that MMSI’s technical assistance has been concentrated on a subset of Pre-AP districts that have either reached out to MMSI or responded to MMSI’s outreach, and that some districts haven’t made use of the MMSI technical assistance resources that are included with their Pre-AP participation. The MMSI program manager said that she has contacted districts and made repeated offers of assistance, but some don’t respond and others say that they don’t need assistance. ESE reported that there were no expectations regarding the extent to which individual districts would accept support, and that perhaps ESE should reach out to districts to determine if they are receiving the technical support that they paid for and may want or need.

A final reported challenge was program sustainability. The ESE program manager noted that district funds for professional development are typically limited, but that one large district has expressed interest in beginning to receive Pre-AP training, and that another large district has trained more than 200 teachers without using any RTTT funds. She emphasized that program sustainability depends on whether districts will fund their own Pre-AP work, and that currently there is no clear information available regarding districts’ planned next steps.

**Conclusions and strategic considerations.** (Each is explained in greater detail in the interim evaluation report in which it was initially written.) Conclusions and strategic considerations from the January 2013 report include:

* ESE may wish to take actions to increase district accountability for submitting vertical team meeting attendance logs.
* ESE or MMSI may wish to speak with the Project 4D districts with high percentages or numbers of teachers who didn’t complete teacher training, as well as those districts and disciplinary teams that didn't participate in administrator or lead teacher training, in order to understand if there are obstacles to completion that can be overcome with internal and/or external support or increased accountability.
* Depending on whether all schools or only Project 4D schools are included, ESE may not yet have met its goal to provide Pre-AP training to teachers in 65 schools in low-income communities.

Strategic considerations from the June report:

* Teachers in some districts may be receiving conflicting messages about the extent to which they should implement Pre-AP lessons and/or assessments.
* Impacts of the Pre-AP program might be strengthened by providing some teachers with additional resources.

Strategic considerations from the September report:

* Clarification of NMSI’s policies regarding access to LTF materials by school personnel who have not received Pre-AP training could help some districts promote broader implementation of Pre-AP strategies.
* Some districts have proposed and/or begun to implement approaches to Pre-AP training that could improve program sustainability after the RTTT funding period.
* Additional support from ESE and the vendor may increase Pre-AP program implementation by districts that appear to be implementing it less intensively.
* In larger districts, efficiencies can be realized by assigning the lead teacher role to a district-level curriculum specialist rather than a classroom teacher.
* Without adequate fee waivers, some students will opt out of taking AP exams.

**STEM-focused Early College High Schools**

In its RTTT proposal, ESE proposed to open six STEM early college high schools to reduce achievement gaps, provide an accelerated pathway to postsecondary education for underrepresented students, and prepare students for productive STEM careers by partnering with colleges and providing opportunities to earn up to two years of college credit while still in high school. Six districts were chosen in a competitive process and are currently receiving RTTT Goal 4E funds for this purpose. Eight additional STEM ECHS sites in the state are being established, most with the support of discretionary RTTT funds. These additional sites may be included in future evaluation activities, but ESE has requested that UMDI postpone evaluation of the other eight sites until their work has progressed further.

Evaluation activities during Year 3 included interviews with ESE program managers, the technical assistance vendor, STEM ECHS program administrators, and IHE partners; a survey of school personnel from the five implementing sites; site visits; and analysis of relevant documents and databases.

The six Goal 4E STEM ECHS sites are in various phases of project development and implementation. Five sites enrolled students in STEM ECHS activities during the 2012–13 school year. The sixth site plans to launch its STEM ECHS during the 2013–14 school year

Interviewees reported the following main successes:

* STEM ECHS students are engaging with STEM content.
* Four sites are facilitating college experiences for students.
* Sites have moderate or strong support from school and district leaders.
* Most sites are building strong partnerships with their partnering IHEs.
* STEM ECHS sites and their IHE partners are planning for sustainability.

Interviewees also reported several challenges. All indicated that sustainability is an ongoing challenge and a primary concern. Several stressed that operational expenses for their STEM ECHS present a significant hurdle to implementation, because costs associated with staff development, curriculum development, planning time, supplies, college course tuition, and travel all exceed average per pupil expenditures for their districts. Each implementing site reported logistical challenges that included course location, scheduling, and timing; different numbers of students across cohorts; transportation; staffing; and assessment. Administrators at each implementing site said that their leadership teams were working closely to address these logistical concerns, many of which had been difficult to anticipate. Interviewees also said that maintaining staffing continuity was a challenge. Each STEM ECHS site has experienced or is currently experiencing one or more significant transitions in district, school, program, and/or IHE partner leadership. JFF said that most sites failed to establish sufficient administrative structures to support staffing transitions.

The findings from the STEM ECHS Personnel Survey indicate that:

* Most respondents believe that their district has a plan for and is committed to developing and supporting the STEM ECHS.
* Most respondents believe that STEM ECHS teachers and students have access to necessary resources and supports.
* Most respondents have found the technical assistance provided by ESE and Jobs for the Future (JFF), the technical assistance vendor for the Goal 4E sites, to be helpful.
* Half of all respondents believe that their district will not have sufficient funds to support their STEM ECHS after the RTTT funding period is over.

All districts reported that ESE had consistently provided effective, professional, and timely assistance. Districts noted that ESE personnel were aware of, and sensitive to, the contexts in which the districts were working. The majority of districts said that JFF was viewed as a valued partner that was helping to move their programs forward. The support that JFF provided to the sites includes group technical assistance meetings with all six schools and individual consultation tailored to each site’s needs.

ESE and JFF said that technical assistance resources will decrease during Year 4. The focus of JFF’s technical assistance will shift from providing “on-the-ground support” to supporting districts’ efforts to explore, develop, and implement plans for sustainability. To facilitate this shift, the primary technical assistance consultant will be replaced by a new consultant who will work with sites primarily on sustainability issues.

All interviewees reported that finding the financial resources to sustain the STEM ECHS sites will be a significant challenge. No districts have established a clear plan for addressing this issue, although several said that they anticipated committing increased levels of attention to sustainability issues over time.Oneinterviewee also suggested that the state could consider adopting policies that would benefit or expedite the development of STEM ECHSs and other programs providing high school students with early college experiences.

**Conclusions and strategic considerations.** (Each is explained in greater detail in the interim evaluation report in which it was initially written.) Conclusions and strategic considerations from the January 2013 report include:

* Continuity of leadership and succession planning appear important to success of the STEM sites.
* Securing the financial resources to sustain STEM ECHS partnerships continues to be a primary concern of all STEM ECHS sites.
* Tailoring technical assistance meetings to grantee needs could yield higher satisfaction and possibly increased impact.

Conclusions and strategic considerations and from the June 2013 interim evaluation report include:

* Sustainability continues to be a primary concern for all STEM ECHS sites and IHE partners.
* Several STEM ECHS sites are still developing or significantly modifying their curriculum and planned course sequences.
* Many sites are working to develop systems for student support.
* Four sites are exploring the possibility of working with additional IHE partners to expand college course offerings, increase programming flexibility, and maximize the impact and efficiency of their programming.

**MassCore Policy and Implementation**

The Massachusetts High School Program of Studies (MassCore) recommends a set of courses and other learning opportunities that Massachusetts students should complete before graduating from high school, in order to arrive at college or the workplace well-prepared and without the need for remedial coursework. The 155 districts that selected the RTTT college and career readiness goal committed to implementing strategies to increase the percentage of their students who complete the MassCore curriculum.

The state’s RTTT goal is to increase the statewide MassCore completion rate from its baseline of 70% of the Class of 2010 graduates to 85% of the Class of 2014 graduates. The state has created a goal for each district, using a formula based on the district’s reported 2010 MassCore completion rate (calculated from the MassCore element of the state’s SIMS database), the district’s number of 2010 graduates, and the total number of graduates statewide needed to bridge the gap between the 70% baseline and the 85% goal. Each district was also expected to determine areas in which courses or supports needed to be expanded in order to meet the 2014 targets, and to create and implement a plan to improve the accuracy of their reporting of MassCore completion levels.

Evaluation activities during Year 3 included an interview with the ESE program manager, interviews with five district data administrators, a review and analysis of ESE auditor reports from two districts, various ESE documents related to MassCore, information retrieved from ESE’s School/District Profiles and SIMS databases, and district responses from the RTTT Years 2–4 continuation funding proposal.

**District administrator interviews.** Interviews with district data administrators focused on district processes for determining MassCore completion status, including any challenges encountered and technical assistance needed. Two districts said that guidance staff review students’ individual transcripts by hand, and one said that software calculated completion status based on course codes and grades entered into a student information system. One district said that they don’t calculate students’ status because they know that no students have completed MassCore requirements. In the final district, MassCore completion status had not been calculated prior to UMDI’s initial interview. However, subsequent follow-up revealed that the district had calculated completion status for all students via transcript review. This district noted that UMDI’s interview was a catalyst for completing this process.

Four out of five districts reported challenges or questions related to determining a students’ MassCore completion status; only one district reported that the process was entirely straightforward. Challenges included issues related to applying physical education (PE) requirements uniformly, lack of alignment between MassCore requirements and typical course scheduling at career and technical education schools, and a perceived conflict between MassCore and existing graduation requirements. Specifically, one district does not want to introduce MassCore requirements, because they anticipate that doing so would further reduce their already low graduation rates. They are currently more accountable for increasing their graduation rate than their MassCore completion rate, so they prioritize the graduation rate.

**MassCore completion rates.** Review of two ESE auditor reports found high rates of accuracy when student transcripts were compared to the MassCore completion indicator that the two audited districts had provided to ESE. However, UMDI was not able to conclude from these findings that Massachusetts districts, in general, are reporting the MassCore indicator accurately.

UMDI then calculated state and district MassCore completion percentages and found that the statewide MassCore completion rate has decreased slightly, from 69.6% for 2009–10 graduates (the year before RTTT began) to 68.3% for 2011–12 graduates. While this trend is in the opposite direction of the state’s goals, additional investigation is required to determine whether the trend reflects reporting error rather than an actual decline in MassCore completion rates. This is because, as reported by UMDI previously, there is strong evidence of substantial inaccuracy in district reporting of MassCore completion rates.

To understand how district reporting might influence the observed decline in statewide MassCore completion rates, UMDI examined MassCore completion rates and trends for each district over a four-year period (from 2008–09 to 2011–12). These data suggest that some districts have adjusted their MassCore reporting practices over time, and that these changes could be obscuring actual increases or decreases in the state’s overall MassCore completion rate. Several groupings of districts are highlighted that could be useful in identifying districts that could serve as models, as well as districts that may require particular types of technical assistance with regard to increasing MassCore completion rates.

**District needs assessments and action plans.** As part of their continuation funding reports for Years 2–4, each district was asked to write a brief needs assessment identifying current course taking and other gaps in their district that may account for low levels of MassCore completion. Districts were also asked to identify possible solutions to increase MassCore completion. In total, 132 districts provided statements. The most common success cited by districts was that local graduation requirements had already been aligned to MassCore, so 100% of their graduates had completed MassCore. A few districts reported year-to-year improvements in their MassCore completion rates. Reported challenges related to MassCore completion included that district graduation requirements were not aligned with MassCore, many high needs and at-risk students lacked foundational skills necessary to complete MassCore, the district lacked needed staffing and/or curricular materials, and logistical challenges prevented students from completing some MassCore course requirements.

Ninety-nine districts described ongoing and planned strategies for improving MassCore completion rates. The strategies included focusing on aligning the district’s graduation requirements with MassCore requirements, adjusting K–12 curriculum scope and sequence, modifying or developing new courses, providing professional development to raise awareness of MassCore requirements, and monitoring and reviewing students’ progress toward MassCore completion.

**Strategic considerations.** (Each is explained in greater detail in the interim evaluation report in which it was initially written.) Strategic considerations from the June 2013 report include:

* Improved accuracy of MassCore reporting should be attainable through low-demand actions and interventions.
* Clarifying the relationship between physical education requirements and MassCore completion could improve reporting accuracy.
* ESE may wish to work toward having the Student Course Schedule database replace the MassCore indicator in SIMS.

Strategic considerations from the September 2013 report include:

* Validity of the MassCore reporting element may be increased by working with districts that have unlikely patterns of MassCore completion.
* Districts that have similar and low or decreasing patterns of MassCore completion may benefit from common interventions that could increase their completion rates.
* Districts that have similar and high or increasing patterns of MassCore completion may serve as models that could help other districts improve.
* It appears that ESE uses slightly different criteria to identify graduates for MassCore calculations than to identify graduates for graduation rate calculations. If so, applying the same criteria for both calculations could increase their concordance and simplify the interpretation of relevant comparisons.

# Introduction

The Massachusetts Department of Elementary and Secondary Education (ESE) was awarded a federal Race to the Top (RTTT) grant for the years 2010–2014. The college and career readiness (C&CR) components of the grant were designed to help students develop “knowledge and skills necessary for success in postsecondary education and economically viable career pathways.” The RTTT initiatives are intended to provide students with opportunities to participate in quality, upper-level high school coursework and new approaches to assist them with high school completion and transition to higher education and the workforce. These programs are part of a broader effort, as specified in the Delivery Plan of ESE's College and Career Readiness group, to increase the Massachusetts 5-year high school graduation rate to 88.3% and the number of students who complete the MassCore program of study to 85% statewide.

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**Evaluation Questions**

Evaluation of the RTTT college and career readiness programs encompasses data collection and analysis to facilitate both process and outcome evaluations. The programs are being evaluated both individually and collectively, and the project-wide evaluation questions listed below are tailored to both the individual and collective evaluations.

**Process Evaluation Questions**

1. In what ways have grantees implemented the program components? What are the major challenges to and facilitators of successful program implementation encountered by grantees? What midcourse corrections and attempts to overcome challenges have been undertaken? What additional steps are planned?
2. In what ways has ESE implemented the program components described in their grant application? What are the major challenges to and facilitators of program support and facilitation encountered by ESE? How have challenges been overcome and midcourse corrections undertaken? What additional steps are planned?
3. How do key project stakeholders rate and explain the quality, relevance, and effectiveness of major program components and services?
4. What infrastructure, systems, and processes were put in place to aid program sustainability during and beyond the grant period? What are the greatest challenges and barriers to creating sustainability?

**Outcome Evaluation Questions**

1. What progress is being made toward the two top-priority goals of ESE's CCR Delivery Plan – increasing the 5-year high school graduation rate to 88.3 percent, and increasing the number of students who complete the MassCore program of study to 82.5 percent?
2. To what extent are students in RTTT-funded programs achieving improved outcomes in college and career readiness indicators including graduation, measures of academic achievement (e.g., MCAS, SAT, and AP), participation and success in AP courses and exams, accumulation of high school and college credits, and MassCore completion?
3. At the school and district levels, do observed changes differ across student characteristics such as gender, race/ethnicity, free/reduced lunch status, ELL status, and special education status? Is there evidence that gaps are narrowing? Are program services reaching students who are at the greatest risk?
4. To what extent are observed changes in student outcomes attributable to program activities (including combinations of program activities) versus contextual variables or non-RTTT interventions?
5. What differences in program features, implementation, and contextual variables can be identified across programs whose levels of improvement differ substantially?
6. What is the relationship between level of program implementation and achievement of targeted student outcomes?

Massachusetts Race to the Top College and Career Readiness Initiatives

Interim Evaluation Report, January 2013

Prepared for the Massachusetts Department of Elementary and Secondary Education

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# Introduction

The Massachusetts Department of Elementary and Secondary Education (ESE) was awarded a federal Race to the Top (RTTT) grant for the years 2010-2014. The college and career readiness (C&CR) components of the grant were designed to help students develop "knowledge and skills necessary for success in postsecondary education and economically viable career pathways." The RTTT initiatives are intended to provide students with opportunities to participate in quality, upper-level high school coursework and new approaches to assist them with high school completion and transition to higher education and the workforce. These programs are part of a broader effort, as specified in the Delivery Plan of ESE's College and Career Readiness group, to increase the Massachusetts 5-year high school graduation rate to 88.3% and the number of students who complete the MassCore program of study to 85.0% statewide.

The RTTT C&CR evaluation is being conducted by the UMass Donahue Institute (UMDI). This document is the first of a planned series of three reports for Year 3 of the evaluation (10/1/12 - 9/30/13), which are to be presented at the end of January, June, and September 2013. The primary purpose of the January and June reports is to provide ESE with timely information and feedback that can be used for program monitoring, improvement, and technical assistance. Different depths of information are provided for different programs, depending on the scope of each program, the timing of the Year 3 evaluation plan and availability of data sources, and UMDI’s understanding of the relative priority of each aspect of the evaluation. The comprehensive annual report in September will also provide a thorough description of background, methods, and findings.

# Pre-AP Training and Alignment

## Methods

This report includes information collected from the following data sources:

* *Training registration and attendance database.* MMSI developed and populated a database that tracked teacher, lead teacher, and administrator registration for and attendance at Pre-AP training.
* *Vertical team meeting attendance database.* In collaboration with MMSI and ESE, UMDI developed and populated a database that tracked attendance at vertical team meetings. UMDI created a form for districts to report attendance and sent them monthly reminders to submit data updates as additional vertical team meetings were conducted.
* *ESE documents and databases.* ESE provided the state’s SIMS, EPIMS, and AP databases; a spreadsheet that indicates which districts ESE is designating as Project 4D; and a spreadsheet that indicates which schools ESE has currently designated as members of the highest and lowest income quartiles.
* *Communications (email, phone, and interview)* with the ESE program manager and project director and the technical assistance vendor (MMSI).

**Categorization of Project 4D Districts**

Districts are participating in Pre-AP training and implementation in multiple configurations. The configuration proposed by RTTT Project 4D was that districts would create discipline-specific vertical teams of middle school and high school teachers, send those teachers for four-day Pre-AP trainings in three consecutive summers, and assign lead teachers who would receive additional training and lead quarterly meetings of their vertical teams to share and deepen the district’s Pre-AP practices.

ESE’s designation of each district’s Project 4D status will be used whenever analyses are conducted regarding the 4D districts. Currently this includes 42 districts, 40 using RTTT Project 4D funds and two using district funds to pay for their Pre-AP training and support. UMDI’s current understanding, to be further explored during the course of the evaluation, is that not all districts designated as Project 4D are meeting the criteria described above. UMDI will continue to collect data on training duration and the extent of vertical teaming, to enable impact analyses for districts with differing levels of implementation. This will enable UMDI to describe the diverse types of implementation across 4D districts, as well as to investigate levels of program impact in districts with differing levels of implementation.

**Site Visit Selection and Instruments**

Three site visit districts were selected based on criteria of highest priority to ESE, to include Project 4D districts in their second year of implementation with a large number of trained teachers and a high percentage of at-risk or high-need students. Each site visit will focus on one of the three disciplines in which Pre-AP training is offered (i.e., ELA, mathematics, and science). The three site visits will take place starting in February, so no site visit findings are available for this report.

Year 3 visits to the three sites will include interviews with an administrator, the lead teacher, and two other teachers in a single academic discipline, as well as observations of a vertical team meeting and a teacher delivering an LTF lesson. New and updated instruments for these visits are the Pre-AP Administrator Interview (Appendix A), Teacher and Lead Teacher Interview (Appendix B), Vertical Team Meeting Observation Protocol (Appendix C), and Classroom Observation Protocol (Appendix D). The classroom observation instrument was provided by MMSI and LTF, and was adapted from the UTeach Observation Protocol (UTOP).

**Outcome Indicators**

Since the last report, some anticipated data sources were eliminated as potential implementation and outcome indicators. LTF had originally indicated that they could provide teacher-level data on utilization of the forums and curriculum resources on the LTF website, which was a planned indicator of program implementation. However, LTF will not be able to provide these data. In addition, MMSI had originally intended to collect PSAT scores from participating districts, but ESE and UMDI agreed that the added value of these data would not be offset by the substantial burden to MMSI and districts. ESE obtains an annual database of all SAT scores statewide, and these scores were determined to be of at least equal value to PSAT scores, and less burdensome to collect; therefore, SAT scores will be used in lieu of scores on the PSAT.

**AP Course Enrollment and AP Exam Performance**

Two of ESE’s questions related to the Pre-AP program are:

1. What percentage of high-need students are currently enrolled in AP courses (by content area, by district)?
2. What percentage of high-need students currently score a 3 or better on an AP exam (by content, by district)?

UMDI has begun conducting analyses related to these questions, which involve the following steps:

1. *Identifying students who are enrolled in AP courses and who have taken AP exams.* UMDI has finished identifying the students who have taken AP exams, along with their scores. This information is currently in the form of a 30-page series of tables that UMDI will provide to ESE if requested. The tables are not included in this interim report because, without the remaining steps completed, UMDI thought that the tables would not be of high informational value to ESE. Analyses of which students are enrolled in AP courses are still in progress.
2. *Identifying high-need students.* During recent conversations, UMDI has been working with ESE to define “high need” for the purposes of these evaluation questions. UMDI and ESE had settled on one definition, but then recently agreed to include former English language learners (FELLs). We are still working with ESE to agree on how to calculate the FELL indicator. After that process is complete, our work on answering these questions will continue.
3. *Identifying students who have been taught by a Pre-AP trained teacher.* The relevance of this question as an impact indicator for the Pre-AP program will depend on further discussions with ESE, regarding whether the program’s intended impacts are on AP course enrollment and AP exam performance for all students in the district, or just those who have been taught by a Pre-AP-trained teacher. Carrying out this step also depends on the EPIMS SY12 file, which UMDI did not receive in time to conduct analyses for this report.

## Findings

**Number of School Personnel Trained**

The table below shows the number of teachers trained in each district and discipline. It reflects ESE’s request to consider teachers “trained” if they have completed at least three days of Pre-AP training. The table counts those three days even if they were accrued across two summers, although future analyses may handle this issue differently. The phrase “unique teachers” in the table’s title indicates the total number of individuals who received training. Some of these individuals participated in training during both the summers of 2011 and 2012.

Using project terminology, teachers who participated in training during each summer would have filled two “teacher seats,” and a table showing teacher seats (to be included in future analyses) would yield higher totals than shown below. Nonetheless, the total unique teachers trained (481 in ELA, 413 in math, and 225 in science, with one trained in both math and science) sums to 1,118, so ESE’s current RTTT goal of reaching 1,000 teacher seats has been exceeded. (The term “current” goal is used because there has been some change over time in what was intended by the goal of 1,000 teachers cited in the original Massachusetts RTTT proposal.)

The table also shows that of all unique teachers who participated in at least one day of Pre-AP training, those completing at least three days of training included 83% of ELA teachers (481 out of 577), 78% of math teachers (413 out of 532), and 76% of science teachers (225 out of 295). These data should be considered preliminary, as 49% (N=139) of the “non-completers” are from districts (i.e., Attleboro, Chicopee, Holyoke, Pittsfield, Springfield, and West Springfield) whose third and/or fourth day of training were scheduled to take place during the 2012-13 school year, rather than during the summer of 2012. Many of these teachers will presumably complete their training and be reflected in versions of the MMSI database subsequent to the one on which the table was based. Of greater potential concern are those Project 4D districts whose training days appear to have been offered, but which nonetheless have a high number or percentage of non-completers (e.g., Boston, Chelsea, Fall River, Malden[[1]](#footnote-1), New Bedford, Salem, and Waltham).

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Pre-AP Unique Teachers Trained, by District and Discipline** | | | | | | |
|  | Attended 2 Days or Less | | | Attended 3 Days or More | | |
|  | ELA | Math | Science | ELA | Math | Science |
| Academy of Pacific Rim Charter | 0 | 0 | 1 | 0 | 7 | 4 |
| Ashland | 0 | 0 | 2 | 1 | 2 | 1 |
| Attleboro | 1 | 0 | 0 | 15 | 0 | 0 |
| Auburn | 0 | 0 | 0 | 7 | 5 | 0 |
| Barnstable | 0 | 1 | 0 | 4 | 14 | 4 |
| Bellingham | 0 | 0 | 0 | 0 | 0 | 2 |
| Berkshire Hills | 0 | 0 | 0 | 0 | 0 | 4 |
| Blackstone Valley Voc Tech | 0 | 0 | 2 | 0 | 3 | 1 |
| Blackstone-Millville | 0 | 0 | 0 | 0 | 0 | 1 |
| Boston | 1 | 13 | 9 | 3 | 53 | 25 |
| Boston Collegiate Charter | 0 | 0 | 0 | 1 | 0 | 0 |
| Brockton | 0 | 1 | 2 | 8 | 5 | 4 |
| Carver | 0 | 0 | 0 | 0 | 1 | 0 |
| Central Berkshire | 0 | 0 | 0 | 3 | 2 | 0 |
| Chelsea | 0 | 4 | 0 | 8 | 5 | 1 |
| Chicopee | 0 | 14 | 0 | 0 | 62 | 0 |
| City On A Hill Charter | 0 | 0 | 0 | 0 | 2 | 2 |
| Danvers | 0 | 0 | 0 | 2 | 3 | 3 |
| Dedham | 0 | 0 | 0 | 1 | 0 | 0 |
| Douglas | 0 | 0 | 0 | 0 | 0 | 1 |
| Dracut | 0 | 0 | 0 | 2 | 0 | 2 |
| Dudley-Charlton Reg | 0 | 0 | 0 | 0 | 0 | 1 |
| East Bridgewater | 1 | 0 | 0 | 0 | 0 | 0 |
| Easthampton | 0 | 2 | 1 | 5 | 4 | 1 |
| Everett | 1 | 3 | 0 | 28 | 23 | 0 |
| Fairhaven | 0 | 0 | 0 | 0 | 8 | 0 |
| Fall River | 5 | 0 | 0 | 30 | 0 | 0 |
| Falmouth | 0 | 0 | 0 | 7 | 7 | 5 |
| Fitchburg | 0 | 0 | 1 | 0 | 0 | 1 |
| Framingham | 0 | 2 | 2 | 0 | 8 | 8 |
| Gardner | 0 | 0 | 0 | 1 | 0 | 2 |
| Holyoke | 16 | 0 | 0 | 62 | 0 | 1 |
| Holyoke Community Charter | 0 | 0 | 0 | 1 | 0 | 0 |
| Ipswich | 0 | 1 | 1 | 0 | 0 | 0 |
| Lawrence | 0 | 0 | 0 | 0 | 1 | 0 |
| Lee | 0 | 0 | 1 | 0 | 1 | 0 |
| Leicester | 0 | 0 | 0 | 0 | 1 | 0 |
| Leominster | 0 | 0 | 0 | 0 | 3 | 0 |
| Ludlow | 0 | 0 | 0 | 0 | 0 | 3 |
| Lunenburg | 0 | 0 | 0 | 1 | 0 | 0 |
| Lynn | 0 | 0 | 0 | 0 | 1 | 0 |
| Malden | 9 | 1 | 6 | 21 | 6 | 22 |
| Mansfield | 0 | 0 | 1 | 0 | 0 | 0 |
| Marlborough | 0 | 0 | 0 | 2 | 3 | 5 |
| Mashpee | 1 | 0 | 0 | 0 | 2 | 1 |
| Medford | 0 | 0 | 1 | 0 | 0 | 0 |
| Medway | 0 | 0 | 0 | 0 | 0 | 1 |
| Milford | 0 | 0 | 0 | 3 | 3 | 3 |
| Milton | 0 | 0 | 0 | 0 | 1 | 0 |
| New Bedford | 14 | 6 | 5 | 26 | 15 | 13 |
| North Adams | 0 | 1 | 1 | 4 | 3 | 3 |
| North Brookfield | 0 | 0 | 0 | 0 | 5 | 0 |
| Northampton | 0 | 0 | 0 | 0 | 4 | 1 |
| Northbridge | 0 | 0 | 0 | 0 | 1 | 2 |
| Norton | 0 | 0 | 0 | 0 | 4 | 0 |
| Palmer | 2 | 1 | 0 | 0 | 2 | 2 |
| Pittsfield | 1 | 49 | 0 | 8 | 0 | 0 |
| Plymouth | 0 | 0 | 0 | 0 | 1 | 0 |
| Randolph | 0 | 0 | 0 | 3 | 0 | 0 |
| Revere | 0 | 0 | 0 | 3 | 3 | 4 |
| Sabis International Charter | 0 | 2 | 0 | 6 | 3 | 0 |
| Salem | 11 | 0 | 1 | 74 | 0 | 1 |
| Saugus | 0 | 0 | 1 | 7 | 7 | 7 |
| Somerset | 0 | 0 | 0 | 0 | 9 | 0 |
| South Hadley | 0 | 0 | 0 | 0 | 0 | 1 |
| South Shore Charter | 0 | 0 | 0 | 2 | 0 | 0 |
| Southbridge | 1 | 2 | 0 | 7 | 5 | 0 |
| Southwick-Tolland | 0 | 0 | 0 | 6 | 6 | 0 |
| Springfield | 13 | 5 | 25 | 39 | 28 | 21 |
| Stoneham | 0 | 0 | 0 | 0 | 0 | 1 |
| Swampscott | 2 | 1 | 0 | 13 | 8 | 2 |
| Uxbridge | 0 | 0 | 1 | 0 | 1 | 5 |
| Wachusett | 0 | 1 | 0 | 0 | 0 | 1 |
| Waltham | 3 | 7 | 0 | 36 | 36 | 15 |
| Wareham | 1 | 0 | 0 | 1 | 2 | 1 |
| Wellesley | 0 | 0 | 0 | 0 | 1 | 0 |
| West Springfield | 13 | 2 | 0 | 18 | 16 | 2 |
| Whitman-Hanson | 0 | 0 | 1 | 7 | 7 | 7 |
| Whittier Reg Voc Tech | 0 | 0 | 0 | 5 | 6 | 5 |
| Winchendon | 0 | 0 | 0 | 0 | 3 | 3 |
| Worcester | 0 | 0 | 4 | 0 | 1 | 40 |
| Missing | 0 | 0 | 1 | 0 | 0 | 1 |
| **Total** | **96** | **119** | **70** | **481** | **413** | **225** |
| *Note:* The one teacher who was trained in both math and science was counted in both disciplines, and the one teacher who was trained in two districts was counted in both districts. | | | | | | |

Administrators and lead teachers from Project 4D districts also participated in trainings specific to their roles, as shown in the table below. Half of the 42 Project 4D districts have had at least one administrator attend administrator training, and 74% (N=31) have had at least one teacher attend lead teacher training. The 74% figure overestimates the participation by disciplinary teams, because some 4D districts are participating in training in more than one discipline, and the 42 Project 4D districts include a total of 81 disciplinary teams. The summer 2012 lead teacher training attendance data was provided to UMDI by district, but not by discipline; if discipline data were provided, it would be possible to report what percentage of disciplinary teams had at least one teacher attend lead teacher training.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Participation in Pre-AP Administrator and Lead Teacher Training** | | | | |
|  | Administrator Training | | Lead Teacher Training | |
|  | # of Participants | # of Districts | # of Participants | # of Districts |
| Summer 2011 | 23 | 10 | 33 | 15 |
| Summer 2012 | 24 | 13 | 77 | 29 |
| *Note:* Some districts participated in training but are not reflected in the table, because they are not Project 4D districts (i.e., Barnstable, Norton, and Springfield), withdrew from Project 4D (i.e., Brockton), or are not from Massachusetts (i.e., Central Falls, RI). | | | | |

**Schools Served in Low-Income Communities**

In addition to the goal of providing Pre-AP training to 1,000 teachers, the Massachusetts RTTT proposal indicated that, by the end of the grant period, the state would have provided Pre-AP training to teachers in up to 65 schools in low-income communities. ESE requested that schools serving low-income communities be defined as schools in the lowest income quartile based on the percentage of students receiving free and reduced-price lunch. As shown in the table below, Pre-AP training has been provided to teachers from 96 schools in the lowest-income quartile, including 56 schools from Project 4D districts. Almost all of the remaining schools are from districts in the two middle-income quartiles, with only five schools being from the highest-income quartile.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Number of Schools With Pre-AP Trained Teachers,**  **by Income Quartile** | | | | |
|  | All Pre-AP Schools | | Schools in Project 4D Districts | |
| Schools | % | Schools | % |
| Lowest Quartile | 96 | 46.2 | 56 | 60.9 |
| Middle Quartiles | 107 | 51.4 | 35 | 38.0 |
| Highest Quartile | 5 | 2.4 | 1 | 1.1 |
| **Total** | **208** | **100.0** | **92** | **100.0** |

**Vertical Team Meeting Attendance**

The number of vertical team meetings held by a district is one indicator of Pre-AP implementation. In both years of program implementation (i.e., Years 2 and 3), UMDI has emailed the lead teachers and district administrators of Project 4D districts multiple times, each time sending an attendance form and requesting that the district representatives submit logs of all Pre-AP-trained and other personnel who have attended vertical team meetings.

The table below shows the number of vertical team meetings for which attendance logs have been submitted by each Project 4D district. Cohort 1 districts are presented first and should have held vertical team meetings in both Years 2 and 3, whereas most Cohort 2 districts should have held vertical team meetings only in Year 3. One exception is Chicopee, which completed LTF Part 1 training in January of 2012 and began full implementation during Year 2. The remaining Cohort 2 districts that submitted vertical team meeting logs for Year 2 (i.e., Saugus and Somerset) were originally considered Cohort 1 districts; UMDI does not currently know why the cohort designation of these two districts was changed.

Year 3 data are still being actively collected and therefore will change, so the following brief summary of the table is based only on the Year 2, Cohort 1 data. As shown in the table, 12 out of 17 districts (71%) submitted attendance data for at least one discipline, and 23 out of 34 district disciplinary teams (68%) submitted attendance data. Of these 23 teams, 30% (N=7) submitted data for two meetings, 22% (N=5) for three meetings, and 48% (N=11) for four meetings.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Vertical Team Meeting Attendance Logs Submitted, by Cohort, District, and Discipline** | | | | |
| **Cohort** | **District** | **Discipline** | **Logs Submitted, Year 2** | **Logs Submitted, Year 3** |
| 1 | Attleboro | ELA | 4 | 2 |
| 1 | Auburn | ELA | 4 | 0 |
| Math | 0 | 2 |
| 1 | Boston | Math | 4 | 0 |
| Science | 3 | 0 |
| 1 | Chelsea | ELA | 2 | 2 |
| Math | 2 | 0 |
| Science | 2 | 0 |
| 1 | Easthampton | ELA | 0 | 0 |
| Math | 0 | 0 |
| 1 | Everett | ELA | 4 | 1 |
| Math | 4 | 2 |
| 1 | Fall River | ELA | 4 | 0 |
| 1 | Malden | ELA | 3 | 2 |
| Science | 4 | 0 |
| 1 | North Adams | ELA | 2 | 0 |
| Math | 2 | 0 |
| Science | 2 | 0 |
| 1 | Pittsfield | ELA | 0 | 0 |
| 1 | Salem | ELA | 0 | 0 |
| Math | 0 | 0 |
| 1 | Southwick-Tolland | ELA | 0 | 2 |
| Math | 0 | 2 |
| 1 | Swampscott | ELA | 3 | 0 |
| Math | 4 | 0 |
| 1 | Uxbridge | Science | 4 | 0 |
| 1 | Waltham | ELA | 3 | 2 |
| Math | 4 | 1 |
| Science | 4 | 1 |
| 1 | Wareham | ELA | 0 | 0 |
| Math | 0 | 0 |
| Science | 0 | 0 |
| 1 | West Springfield | ELA | 3 | 2 |
| Math | 2 | 2 |
| 2 | Academy of the Pac. Rim | Math | 0 | 2 |
| 2 | Berkshire Hills | Science | 0 | 0 |
| 2 | Central Berkshire | ELA | 0 | 0 |
| Math | 0 | 0 |
| 2 | Chicopee | Math | 4 | 2 |
| 2 | Danvers | ELA | 0 | 0 |
| Math | 0 | 0 |
| Science | 0 | 0 |
| 2 | Falmouth | ELA | 0 | 4 |
| Math | 0 | 0 |
| Science | 0 | 4 |
| 2 | Framingham | Math | 0 | 0 |
| Science | 0 | 0 |
| 2 | Holyoke | ELA | 0 | 2 |
| Science | 0 | 0 |
| 2 | Marlborough | ELA | 0 | 2 |
| Math | 0 | 3 |
| Science | 0 | 3 |
| 2 | New Bedford | ELA | 0 | 3 |
| Math | 0 | 0 |
| Science | 0 | 1 |
| 2 | North Brookfield | Math | 0 | 1 |
| 2 | Sabis International Charter | ELA | 0 | 1 |
| Math | 0 | 0 |
| 2 | Saugus | ELA | 0 | 1 |
| Math | 4 | 1 |
| Science | 0 | 1 |
| 2 | Somerset | Math | 4 | 1 |
| 2 | Southbridge | ELA | 0 | 0 |
| Math | 0 | 0 |
| 2 | Whitman-Hanson | ELA | 0 | 0 |
| Math | 0 | 0 |
| Science | 0 | 0 |
| 2 | Winchendon | Math | 0 | 2 |
| Science | 0 | 2 |
| 2 | Worcester | Science | 0 | 2 |
| *Notes:* The following Project 4D districts are not shown in the table:   * Boston, Boston Preparatory Charter, City on a Hill Charter, Fairhaven, and Northampton, because MMSI asked UMDI not to request attendance logs from these districts until further notice. * Leominster, because MMSI said that they are not holding vertical team meetings. * Ashland, because ESE said they are Project 4D but paying through district funds. * South Hadley and Whittier Regional Vocational Technical, because UMDI was notified that these were Project 4D districts after the first round of Year 3 requests was underway. UMDI first sent a request to Whittier in January 2013. South Hadley only had one teacher trained, so UMDI will confirm with ESE and MMSI whether South Hadley should receive attendance requests. | | | | |

## Strategic Considerations

* **ESE may wish to take actions to increase district accountability for submitting vertical team meeting attendance logs.** While clearly informative, the usefulness of the logs as an indicator of Pre-AP program implementation at the district level is substantially limited by the fact that one-third of district disciplinary teams did not submit attendance data.
* **ESE or MMSI may wish to speak with the Project 4D districts with high percentages or numbers of teachers who didn’t complete teacher training, as well as those districts and disciplinary teams that didn't participate in administrator or lead teacher training, in order to understand if there are obstacles to completion that can be overcome with internal and/or external support or increased accountability.**
* **Depending on whether all schools or only Project 4D schools are included, ESE may not yet have met its goal to provide Pre-AP training to teachers in 65 schools in low-income communities.** Pre-AP training has been provided to teachers in 96 schools in the lowest-income quartile, including 56 Project 4D schools.

# STEM-focused Early College High Schools

## Methods

This report includes information collected from the following data sources:

* *Supplemental student data request.* Supplemental data requests were prepared for STEM ECHS sites, asking them to indicate which students are receiving services, as well as attendance and credit accumulation data that are not included in state databases but are needed for answering evaluation questions.
* *Document review.* UMDI reviewed Year 3 Continuation Reports that were submitted by each STEM ECHS site, a set of site visit reports prepared by Jobs for the Future (JFF) after individual meetings with 5 of the 6 STEM ECHS sites, and JFF’s Basecamp website.
* *ESE databases and documents.* June 2012 SIMS data were used to compile basic demographic and attendance data for STEM ECHS participants, and for students from the schools from which the STEM ECHS participants were drawn.
* *Observation.* UMDI attended a full-day technical assistance meeting hosted by JFF and ESE on December 5th, 2012.

**Site Visits and Instruments**

Each implementing STEM ECHS site will be visited, beginning in February. Each site visit will include one or two interviews with key school personnel and brief observations of school activities. The STEM ECHS Administrator interview protocol has been updated from Year 2 in preparation for these site visits, and is included in Appendix G.

## Findings

**Project Status**

The six Goal 4E STEM ECHS sites are in various phases of project development and implementation. Students are currently participating in STEM ECHS-related activities in five of the six sites. Two sites currently have students who are enrolled in credit-bearing college courses. Brief site-specific updates are provided below.

**Dearborn**. Dearborn is striving to launch STEM ECHS activities with 9th-grade students in September, 2013. At the technical assistance meeting held in December 2012, a Dearborn representative said that it was their goal to implement the “Metro Model, or some variation of this model,” and that the curriculum for the STEM ECHS is currently being developed. Representatives indicated that they are addressing administrative challenges within their district, as well as challenges related to their school building, which is being renovated. A JFF representative said in a recent update that the Dearborn STEM ECHS site is challenged by not yet having clearly defined their plan for the STEM ECHS.

**Marlborough.** There are currently more students enrolled in STEM ECHS activities in Marlborough than in any other STEM ECHS site. They are serving approximately 200 students in grades 6 and 7 at Whitcomb Middle School, and 150 students in grades 9 and 10 at Marlborough High School. At the middle school, an increased focus on STEM is grounded in students’ participation in an engineering course, a 1:1 laptop initiative, and quarterly project-based learning activities for all STEM ECHS participants. Similar activities are integrated into experiences of the 9th- and 10th-grade STEM ECHS students. Additionally, all 9th- and 10th-grade STEM ECHS students are enrolled in advanced-level coursework for all core academic disciplines. Marlborough plans to enroll their first cohort of STEM ECHS students in college-level coursework in fall 2013.

A recent site visit report from JFF noted that the STEM ECHS in Marlborough benefits from a “strong plan [and a] very strong planning team, with distributed leadership responsibilities [and] significant capacity for … school-based change.” JFF noted that changes in key district leadership personnel (including administrators at the high school level) have had a negative impact on the STEM ECHS’s culture and sense of trust. There has been some ambiguity on issues including budgeting protocols, available funding, and program leadership. This shift in school and district personnel has created a need for program stakeholders to revisit the stated vision and mission of the STEM ECHS, so that leaders can promote clarity of purpose, renew teacher buy-in, and realign various school initiatives as appropriate.

**MAVA.** MAVA is currently serving approximately 25 students from 7 schools. The program has a strong focus on information technology, and students are taking classes that utilize a blended model (online and in-person learning activities) through Northeastern University. MAVA continues to benefit from strong central program leadership, a strong partnership with Northeastern, and the commitment from a broad coalition of vocational school and district administrators. JFF reported that MAVA faces the continued challenges of finding ways to distribute program leadership and knowledge, and identifying appropriate instructional leaders for the various learning activities.

**Randolph.** A cohort of approximately 20 11th- and 12th-grade students is currently enrolled in two college-level courses, entitled Truck Components and College Experience, through the STEM ECHS at Randolph High School. Randolph program leaders hope to expand course offerings over time, and to serve more students. Program leaders are actively seeking partners and funders to promote the growth and sustainability of the program. JFF reported that the STEM ECHS at Randolph benefits from strong in-district leadership, as well as a strong partnership with Massasoit Community College, and that the site is challenged by the need to develop in-district and in-school support and buy-in for the project. Turnover in district leadership has caused some anxiety and uncertainty in this context. JFF also suggested that knowledge and governance of the STEM ECHS needs to be broadened to include a larger team of people from within the district, and that the STEM ECHS would benefit from an increased focus on effective instruction and the development of a plan for identifying and preparing a cohort of 9th-and 10th-grade students for possible participation in the STEM ECHS activities.

**Quaboag.** The STEM ECHS at Quaboag is currently serving a cohort of approximately 25 9th- and 10th-grade students, who are currently enrolled in electronics, engineering, and biomedical courses. Quaboag launched their STEM ECHS last year with a cohort of primarily 11th- and 12th-grade students, but has re-launched this year after making significant changes to the program structure and design. They are also hoping to build on the strong interest in STEM programming that has been established through various STEM programs that currently serve students in late elementary and middle school grades in the district. JFF said that the STEM ECHS at Quaboag has a strong leader, but faces a challenge because that leader is on maternity leave. JFF also reported that other district leaders are less engaged with this project, because the school is supporting multiple grants and initiatives, and that the program would benefit from increased focus on effective instruction and efforts to establish a broader coalition of in-district support.

**Worcester.** There are currently 63 9th-, 10th-, and 11th-grade students participating in the STEM ECHS at Worcester North High School, which is part of the school’s Health Sciences Academy. A STEM ECHS representative said that current 9th-grade participants were pre-selected for participation in STEM ECHS activities, and would have an opportunity to earn up to 15 college credits through the program. (UMDI will seek details of the selection process during Year 3 interviews.) A key member of the STEM ECHS team (a former assistant principal) has left the team to become a middle school counselor, taking much of the working knowledge of the STEM program with them and leaving a large administrative gap. A new assistant principal has stepped in to lead and is reorganizing the program. The administrators also face the challenge of recruiting students in a school and district where well-established STEM programming alternatives are available. Advancement Via Individual Determination (AVID), a program designed to support college readiness, remains a key component of the students’ STEM ECHS experience. JFF also noted that the STEM ECHS faces the challenges of Worcester North’s low graduation rate and possible instability of the school’s leadership.

**Preliminary Data Review**

Five STEM ECHS districts were asked to complete a brief supplemental student data request. One site (Dearborn) was not asked to complete this request, because it had been confirmed that this site did not serve any STEM ECHS students during the 2011-12 school year. At the time of this writing, Marlborough, MAVA, and Worcester have submitted supplemental data for the 2011-12 school year, Randolph has reported that they did not serve any students during the 2011-12 school year, and Quaboag’s submission has not been received. A preliminary analysis of the data provided through these requests is provided below, and a complete analysis will be included in a future report.

The table below summarizes enrollment in STEM ECHS activities by site during the 2011-12 school year. A total of 220 students were enrolled, with Marlborough serving the largest group (N=177) and smaller cohorts being served by MAVA and Worcester. Only a small number of students (N=8) exited the STEM ECHS programs at the three sites.

|  |  |  |
| --- | --- | --- |
| **STEM ECHS 2011-12 Enrollment by School** | | |
|  | Number of Students Enrolled in Program | Number of Students Who Exited the Program |
| Marlborough MS (Whitcomb) | 108 | 0 |
| Marlborough HS | 69 | 4 |
| MAVA | 20 | 2 |
| Worcester | 23 | 2 |
| **Total** | **220** | **8** |

The table below summarizes the number of students attempting and earning college credits by school during the 2011-12 school year. A total of 43 students from MAVA and Worcester attempted to earn college credit, and 40 students achieved that goal.

|  |  |  |  |
| --- | --- | --- | --- |
| **College Credits Earned During 2011-12** | | | |
|  | Number of Students Attempting College Credits | Number of Students Earning College Credits | Course Name |
| Marlborough MS (Whitcomb) | 0 | 0 | Not Applicable |
| Marlborough HS | 0 | 0 | Not Applicable |
| MAVA | 20 | 17 | Intro to PC Productivity Tools |
| Worcester | 23 | 23 | ORT-Orientation |

The table below provides average attendance rates for STEM ECHS participants by school, as well as the average rates of attendance for all students from the school from which STEM ECHS participants were selected (i.e., host schools).[[2]](#footnote-2) Host school calculations include STEM ECHS students. The average rate of attendance at each site was higher for STEM ECHS participants than for the host school population.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Attendance** | | | | | | |
|  | ECHS Participants | | | Total Host School Population | | |
|  | Avg. Days in Membership | Avg. Days in Attendance | Avg. Rate of Attendance (%) | Avg. Days in Membership | Avg. Days in Attendance | Avg. Rate of Attendance (%) |
| Marlborough MS (Whitcomb) | 180 | 174 | 97 | 174 | 167 | 96 |
| Marlborough HS | 179 | 171 | 96 | 168 | 156 | 93 |
| MAVA | 180 | 172 | 96 | 171 | 159 | 93 |
| Worcester | 175 | 170 | 97 | 160 | 143 | 90 |

The next four tables summarize demographic and background characteristics of STEM ECHS participants and their host schools, including gender; limited English proficiency, low-income, and special education status; and race/ethnicity. Although significance testing has not been conducted, review of the tables suggests some notable differences, which will be explored through future data collection and analysis.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Gender of STEM ECHS Participants and Host Schools, By School** | | | | |
|  | STEM ECHS Participants | | Total Host School Population | |
|  | Male  (%) | Female  (%) | Male  (%) | Female  (%) |
| Marlborough MS (Whitcomb) | 45 | 55 | 50 | 50 |
| Marlborough HS | 65 | 33 | 52 | 48 |
| MAVA | 84 | 16 | 58 | 42 |
| Worcester | 30 | 70 | 54 | 46 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **LEP, Low-income, and SPED status of STEM ECHS Participants and Host Schools, By School** | | | | | | |
|  | STEM ECHS Participants | | | Total Host School Population | | |
|  | LEP  (%) | Low Income  (%) | SPED  (%) | LEP  (%) | Low Income  (%) | SPED  (%) |
| Marlborough MS (Whitcomb) | 0 | 30 | 9 | 6 | 46 | 19 |
| Marlborough HS | 9 | 39 | 9 | 7 | 38 | 19 |
| MAVA | 0 | 11 | 16 | 7 | 55 | 28 |
| Worcester | 1 | 83 | 4 | 26 | 82 | 21 |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Race/Ethnicity of STEM ECHS Participants, by School** | | | | | | | | |
|  | Student Population | N | White (%) | Black/  African Amer.  (%) | Asian (%) | Amer. Indian/  Alaska Native  (%) | Native Hawaiian/  Pac. Islander (%) | Hispanic/  Latino  (%) |
| Marlborough MS (Whitcomb) | STEM ECHS | 108 | 91 | 4 | 6 | 0 | 0 | 22 |
| Host School | 1497 | 94 | 4 | 4 | 0 | 0 | 33 |
| Marlborough HS | STEM ECHS | 69 | 87 | 6 | 7 | 0 | 0 | 28 |
| Host School | 1295 | 93 | 4 | 3 | 1 | 1 | 30 |
| MAVA | STEM ECHS | 19 | 90 | 5 | 5 | 0 | 0 | 5 |
| Host School | 7783 | 76 | 20 | 6 | 2 | 0 | 24 |
| Worcester | STEM ECHS | 23 | 35 | 39 | 26 | 4 | 0 | 26 |
| Host School | 1385 | 63 | 29 | 9 | 1 | 0 | 45 |
| *Note:* Some students were counted in more than one race/ethnicity category, so the percentage for each school does not equal 100. The N for MAVA is different from the actual number of students enrolled in the program, because one student did not have matching information in the SIMS June 2012 database to identify race. This student was coded as missing. | | | | | | | | |

**Technical Assistance**

**Technical assistance meeting.** A technical assistance meeting organized and hosted by ESE and JFF was held at Worcester Technical High School on December 5th, 2012. Representatives from each STEM ECHS site attended the meeting, ranging from two to seven per site, as well as several representatives from partnering institutions of higher education.

The meeting included several guided activities focused on reflection and planning efforts. JFF shared a STEM ECHS self-assessment tool, and encouraged attendees to consider how this tool could help them with their work. Participants also updated the larger group on their efforts. Challenges and concerns that have arisen across multiple STEM ECHS sites were discussed, including sustainability, buy-in, student access and support, partnerships, and curriculum development. When JFF encouraged sites to share sustainability strategies that they are pursuing, two districts said that they are pursuing funds and support from multiple partners, and one site said that they have obtained 501(c)3 status so that they can receive charitable contributions. Challenges associated with Accuplacer were also of particular interest to several participants, and one district representative shared that they have worked around some Accuplacer logistical challenges by becoming their own testing site. The meeting concluded with a series of reflective reading, writing, and sharing activities designed, in part, to encourage attendees to think critically about JFF’s Common Instruction Framework as a tool for promoting college readiness. JFF encouraged sites to take a systematic approach to determining what “effective instruction” should look like in their STEM ECHSs.

Some attendees commented during the meeting that they were not pleased that the majority of the meeting time had been filled with activities selected by the meeting hosts. Some participants indicated that they had thought that each site would be allowed to focus on the issues most relevant to their site, with JFF and ESE representatives available for consultation and support as needed.

In a brief conversation with representatives from Dearborn, JFF said that they felt disengaged from Dearborn's work, and that this was because Dearborn had requested a reduced level of consultation from JFF. A Dearborn representative responded that the situation at their site had been challenging, in part, because they were dealing with “a lot of moving parts” and “moving targets.” JFF said that they would like to be caught up on the work being done at Dearborn, and they asked Dearborn to explain how JFF might be of service. JFF said, “If you want re-involvement, we need information. If you don’t, then you need to let ESE know.”

One Dearborn representative asked JFF to provide examples of course catalogues and sequences from exemplar STEM ECHS sites. JFF responded that it would make more sense for each site to work out a larger vision for their programs before focusing on course pathways and sequences. The Dearborn representative responded that it didn’t matter if a larger vision had been worked out, because people would take what they needed from the resources that JFF provided. JFF affirmed that this was logical, but indicated that it would be difficult to identify exemplars, because there was no formal national network of STEM ECHS sites. The JFF representative asked if Dearborn had seen some of the work that other local STEM ECHS sites had done, and then briefly described some of the progress that these sites had made. JFF suggested that Dearborn contact representatives from schools within their local network, who could be a useful resource.

**Basecamp website.** JFF’s online network (Basecamp) is no longer accessible to some users, and may be inactive. The website notes that there are no active projects. Use of this site has been limited.

**Summary of Year Three Continuation Reports**

ESE asked each site to provide a report updating their status at the end of Year 2, and all sites submitted a report. They were asked to identify their major strengths, challenges, and technical assistance needs. While many identified similar strengths, the challenges reported were less uniform.

**Strengths.** Three districts stated that a major strength of their project was a positive relationship with their IHE and the active involvement of all participants. One of these district also noted that they have signed partnership agreements with two companies, one museum, and one mentoring organization, in order to raise student awareness of STEM careers. The second district reported that their working group, which consists of all representatives from all departments in their school, plus IHE representatives, is actively moving their partnership forward. The third district reported that they have a cohesive planning team, and that college instructors have been supportive in planning courses and providing additional support to students beyond class time.

Two districts reported curriculum development and implementation as a strength. One district reported that they were able to develop a rigorous and relevant curriculum for mixed-abilities classrooms that also met content standards. This district further noted that their other major strength was embedding critical thinking and problem solving, communication, creativity and innovation, collaboration, and information literacy into their curriculum. Two districts reported that one of their greatest assets was the strong abilities and interests of their students in STEM and STEM careers.

**Challenges.** Sustainability was the only challenge reported by multiple districts (N=2). One district noted that efforts to address their immediate challenges were preventing them from focusing on the demands of sustainability. Other individual challenges, each cited by one site, included: a perception of inequity among teachers, due to STEM teachers receiving reduced teaching loads and individual laptops for their students; the cultural shift from an elite academy to a more inclusive program that mirrors district diversity; teachers’ inability to cover content standards fully while also implementing project-based cross-curricular activities; formalizing the MOU with their IHE partner; bringing efforts to scale; and communication between the coordinator and school staff regarding summer schedules. Another challenge reported by one site involved teaching students the importance of taking the Accuplacer tests for college credit; however, the district has now developed strategies to address this challenge.

**Technical assistance.** Three sites reported that they needed assistance in planning next steps in order to meet their goals. One site needed assistance with establishing a firm launch date for their 9th-grade cohort students, as well as developing a clear process for recruiting and assigning students who were interested in attending the ECHS. Another site needed assistance in logistics, testing, and placement of students as the first student cohort prepares to take classes at the university in the 2013–14 school year. This site also reported that professional development is needed for teachers in project-based and inquiry-based learning approaches.

**Adaptations.** Sites were asked to report any changes that they have made from their original proposal, and three sites reported that they have not made any changes. Two reported that they have made adaptations for teachers. One site said that having enough collaboration time during the school day has been a challenge for middle school teachers, leading the school to provide stipends for after-school collaboration. The same respondent also reported that high school STEM instructors now have to teach one additional course, outside of the STEM area, in order to equalize student loads. Another site reported that their teachers will receive free professional development to increase rigor and incorporate blended-learning strategies through their partnership with the Massachusetts Academy of Sciences.

Two sites shared that they are developing a new school or academy to help support their students. One of these sites reported that they have received funding for an Innovation School and intend to implement a STEM 21st-Century elementary school as early as 2013–14. The second site reported that they were working with the Massachusetts Academy of Sciences to create an academy for high-performing students. The site reported that these students will be trained to mentor 7th-, 8th-, and 9th-grade ECHS students. Middle school students at this site would have access to additional technology resources, the opportunity to receive tutoring from college and high school students, and the option of participating in after-school service learning and lab-based learning activities. The respondent also said that they were piloting blended-learning approaches in order to increase students’ learning time.

Other changes mentioned by one site each included: assigning all STEM ECHS students to the same block schedule; providing bus transportation to and from the IHE site; focusing their ECHS in the engineering and biomedical fields; providing 8th-grade students with an engineering course and cross-curriculum math and science projects that did not previously exist at the middle-school level; and increasing partnership and collaboration by working with a liaison to increase guidance and input from the IHE on coursework development.

**District and IHE partner responsibilities.** Sites were asked to define the roles and responsibilities of the partnering district and the IHE, noting that these should be detailed in an attached MOU. Three respondents reported that IHE sites would make courses and testing available to ECHS students, and that the district and the IHE would grant students both high school and college credit. One respondent explained that their IHE would provide college placement testing and coordinate the development of agreements necessary for high school students to receive college credits.

Three respondents reported collaborations with their IHEs regarding program planning. One site reported discussing the expanded role of their IHE partner as their STEM ECHS becomes fully operational. Another site reported that meetings have been scheduled with their IHE to plan logistics such as scheduling, graduation requirements, courses, sites, transportation, and other considerations for the first cohort of STEM students who will matriculate to the college level in the next school year. The third respondent reported that their IHE will provide guidance in developing a roadmap that identifies the sequence of high school and college courses that students will complete in their career pathways.

Two respondents reported that their partnering IHE is responsible for providing professional development to district teachers and ensuring that their faculty is prepared to teach the curriculum. One district stated that their IHE is currently seeking faculty to support professional development and to serve on the curriculum subcommittee. The other respondent reported that their IHE is developing a professional development plan for an ECHS teacher certificate, and is working with district faculty to ensure that they are prepared to offer college courses. Two sites noted that their partners are responsible for providing free classes and materials to ECHS students, since all fees are to be covered by grant funds, and two sites discussed their IHE's responsibility to provide space and computers for student courses.

Other roles and responsibilities, each reported by one partner, included: establishing opportunities for students to explore and access STEM-related college and career pathways; assisting with data collection to assess the program; and providing insight on whether ECHS students are college- and career-ready academically, socially, and emotionally.

**Target student population.** Respondents were asked to define their target student population. All six ECHS sites reported that their target population include ELL/LEP, low-income, first generation college-bound, and special needs students. Two respondents noted that their target population mirrors the student population and community at large. Two sites also reported that their target population included grades 9–12. One of the respondents reported that they are targeting grades 9–12 now, but hope to extend their program into middle school in the future if funds permit.

**Recruitment, selection, and enrollment.** Respondents were asked to report recruitment and selection strategies and criteria, grade levels, and the number of students to be included initially and at full implementation.

***Recruitment***. Three respondents reported that part of their recruitment strategy involved meeting with parents and guardians. One explained that parents, guardians, and students were introduced to the program and the IHE in the fall and winter of a student’s sophomore year. Another respondent intends to have parent and community meetings to share information and encourage enrollment. The third respondent said that they have already held parent meetings and have engaged in an extensive set of recruitment strategies that includes flyers, websites, voice mail announcements, student assemblies, classroom visits, teacher recommendations, student-to-student recruitment, and a student application with essay questions. One respondent reported that his site has put substantial effort into identifying and enrolling ELL and SPED students by using liaisons and translators. This respondent also said that a presentation was made to all staff at the school to educate them about the ECHS program so that they could encourage students to apply. One site said that they would recruit middle school students beginning in the 8th grade by exposing them to STEM coursework and experiences.

***Selection***. Two respondents reported that interested students applied in the spring and participants were selected by the end of the academic year or summer. Another said that they selected students through a lottery, stratified by student subpopulations, when the number of applicants exceeded available seats, and established a wait list for students who weren’t selected.

***Enrollment.*** Only two sites reported current enrollment numbers. One site said that they accepted 135 out of 172 6th-grade students who applied, and that all 9th-grade applicants were accepted. The other site said that they anticipated enrolling 100 students at the ECHS by the 2012-13 school year.

**Collaboration and curriculum alignment.** Respondents were asked to describe their process for collaboration with districts, IHEs, and community leaders to design an aligned curriculum and sequence of courses that would allow students to earn college credits with a STEM emphasis while also completing high school. Four respondents reported that they have created subcommittees to work on curriculum and course alignment. One site also plans to incorporate input from the STEM business community regarding practical skill sets necessary for students to be successful in the field, and will design a scope and sequence of courses to ensure that students meet 10th-grade benchmarks. One respondent reported that a curriculum subcommittee of school personnel and IHE faculty reviewed the core curricula, examined course content, and developed the program of studies. This respondent stated that participating schools’ information technology program advisory committees, particularly workplace representatives, will be invited to participate in reviewing and revising the curriculum to ensure that it meets industry needs. Another respondent noted that they worked with their IHE partner to align their curriculum and course sequence through a backwards design process, in which they started with the requirements of future college work in mind, and then sought alignment across content areas and grade levels so that students would be prepared for college requirements.

Respondents also reported other notable collaborations. One respondent reported that they were working with IHE personnel to provide professional development and leadership on Accuplacer testing, social–emotional readiness for college, course selection, scheduling, costs, transportation, graduation requirements, and pathways. Another respondent reported that their IHE is working with local business partners to expand community involvement and to provide students with internships, job shadowing, and work-based learning opportunities.

**Modifications from original proposals.** Respondents were asked to describe any changes that their sites had made to encourage academic rigor at the middle-school level. One respondent reported that they have committed to collaborating with their feeder middle school to align course content and rigor, to promote a seamless transition into the ECHS. This respondent also reported that discussions about including 7th- and 8th-grade levels in the ECHS program were underway. One respondent noted that curriculum development at the middle-school level will take place to ensure that students entering the 9th grade will be prepared to take on high school courses. This respondent reported that the middle school will likely supplement the school year with additional out-of-school learning opportunities similar to the summer bridge programs held at the IHE, particularly for rising 9th graders. One respondent reported that personnel were working with middle school students to strengthen skills, and were planning to employ more targeted instruction during the 2012-13 school year. One respondent outlined middle school modifications that had been made to increase rigor, which included free professional development for teachers as well as providing students with access to optional courses, programs, tutoring, and lab space.

**Professional development**. Respondents were asked to identify any professional development that will be provided to meet STEM ECHS goals and facilitate collaboration between school and college instructors. Four respondents stated that school staff will receive professional development from IHEs, foundations, and vendors to increase rigor and improve instruction and technology use. Three respondents reported that they will build upon existing professional development and collaborations to target the specific needs of school and university staff. Three respondents reported that, to facilitate collaboration between high school and college instructors, teachers will co-teach professional development and student courses with IHE faculty.

Two respondents reported that professional development will be provided in the form of master’s degree program targeted to middle and high school science teachers, one offered by Northeastern University through the Boston Science Partnership, and one offered by Worcester State University in conjunction with Quinsigamond Community College. Two respondents reported that they will arrange observations, with one site having high school and college faculty visit each other’s classrooms, and one site attempting to schedule visits to high schools with successful inquiry-based science programs. One site has sent teachers to an AVID summer institute in Philadelphia, and has also convened an in-school two-day summer institute to explore school-wide reform issues that affect the STEM ECHS.

**Community involvement.** Respondents were asked to describe plans for involving the broader community in assessing local workforce needs, and in developing STEM career pathways for students based on those needs. They were also asked to explain how these partnerships will provide internships, job shadowing, and work-based learning opportunities for students. Three respondents reported broadly that they will continue to look for additional opportunities for students. One respondent said that discussions were underway with a partner to establish work-based learning opportunities for students, but that their rural location poses a challenge for which they may need further assistance. Three respondents reported that they will continue to build upon existing relationships to assess needs, seek support for internship programs, and build support from local businesses. Three respondents also noted that they will build internship or externship, job shadowing, and work-based learning opportunities. Other responses, each from one site, included: replicating a model to build statewide STEM networks of partners; creating a council to oversee partnership development; and seeking additional funds to hire a partnership coordinator and increase STEM learning opportunities.

**Sustainability.** Respondents were asked to describe their plans to sustain the ECHS and to identify potential supporters, including partnerships that have been developed to enhance services for student support. Five respondents reported that they are currently collaborating with industry, municipal, and IHE partners to increase access to funding, in order to support their work (N=2), expand community involvement (N=1), and gain industry support for development of future workforce (N=1). Three respondents reported that they are participating in larger networks and initiatives to enhance student support, such as STEM networks, Massachusetts 2020, Smaller Learning Communities, and a pipeline collaborative model. One respondent stated that they intend to present to at least one statewide or regional STEM-focused conference in SY 2013. Other responses, each from one site, included: filing for 501(c)3 status, in order to support the STEM ECHS through grant funding; and participating in a year-long STEM administrative training that trains staff on partnership development in order to sustain STEM work.

## Strategic Considerations

* **Continuity of leadership and succession planning appear important to success of the STEM sites.** Multiple sites reported that lack of continuity, or a degree of instability, in project, school, or district leadership, has hampered their progress. JFF also identified lack of continuity as a significant threat to success and sustainability. Continuity should be encouraged whenever possible, and succession planning should be undertaken when personnel transitions are anticipated.
* **Securing the financial resources to sustain STEM ECHS partnerships continues to be a primary concern of all STEM ECHS sites.** Some sites have taken initial steps to promote sustainability, but ensuring continuity of each STEM ECHS will require additional work. JFF and ESE may therefore wish to make sustainability a continued focus for technical assistance.
* **Tailoring technical assistance meetings to grantee needs could yield higher satisfaction and possibly increased impact.** Some sites had anticipated being able to focus their meeting time on issues that they considered pressing, with JFF and ESE personnel available for consultation, and were displeased not to be able to pursue this agenda. If JFF, based on its greater experience with early college high schools, prefers to determine the agenda, they may wish to communicate and explain their agenda choices to sites very clearly, both in advance of and during the meeting. Alternatively, JFF may wish to solicit topics that sites would appreciate assistance with during the meetings.
* **JFF’s online network (Basecamp) is no longer accessible to some users, and may be inactive.** The website notes that there are no active projects. While use of this site has been limited, ESE and JFF may wish to assess if there is demand for an online sharing tool among STEM ECHS sites. If so, this resource could be revitalized, and members of the Massachusetts STEM Early College High School Network could be encouraged to share and access materials on this site.

# MassCore Policy and Implementation

The Massachusetts High School Program of Studies (MassCore) recommends a set of courses and other learning opportunities that Massachusetts students should complete before graduating from high school, in order to arrive at college or the workplace well-prepared and without need for remedial coursework. The 155 districts that selected the RTTT college and career readiness goal committed to implementing strategies to increase the percentage of their students who complete the MassCore curriculum.

The state’s RTTT goal is to increase the statewide MassCore completion rate from its baseline of 70% of the Class of 2010 graduates to 85% of the Class of 2014 graduates. The state has created a goal for each district, using a formula based on the district’s reported 2010 MassCore completion rate (calculated from the MassCore element of the state’s SIMS database), the district’s number of 2010 graduates, and the total number of graduates statewide needed to bridge the gap between the 70% baseline and the 85% goal. Each district was also expected to determine areas in which courses or supports needed to be expanded in order to meet the 2014 targets, and to create and implement a plan to improve the accuracy of their reporting of MassCore completion levels.

As discussed in the 2012 Annual Report of the RTTT C&CR evaluation, “Meaningful assessment of changes in MassCore completion is challenged by serious validity and reliability limitations of the MassCore element of the SIMS database.” As one step toward providing information relevant to improving the quality of the MassCore SIMS element, the Year 3 evaluation plan for MassCore includes interviews with district data administrators that will focus on the processes by which the MassCore SIMS element’s value is determined. If indicated in light of findings from these interviews, to be decided in collaboration with ESE, an online survey of data administrators in all districts who are receiving RTTT C&CR funds will further address these issues. These interviews are scheduled to take place in March 2013, with the follow-up survey, if conducted, scheduled to take place in May 2013. During Year 3, ESE notified UMDI that an internal ESE auditor was visiting several districts to address issues that would include the SIMS MassCore element. ESE agreed that they will attempt to provide the auditor's reports and instruments to UMDI. ESE sent two of the auditor’s four district audit reports to ESE in late January, so they have not yet been analyzed for this report, but they will be used to inform UMDI's instrument development and data collection.

With regard to the district needs assessments and plans mentioned above, the RTTT federal performance measure for MassCore is “LEA has performed a needs assessment and developed a plan for increasing the N of students completing MassCore.” ESE’s program managers for MassCore have explained to UMDI that the needs assessment and plan that ESE is requesting from districts is in response to a question on the RTTT Years 2-4 Continuation Report that each RTTT-funded district was required to submit. UMDI received these responses from ESE in January, and they have not been fully reviewed and analyzed for this report. From a quick review, however, it is apparent that these needs assessments and plans are brief, ranging from one sentence to 2-3 paragraphs. Beyond submitting these needs assessments and plans, ESE program managers have indicated that districts have no other formal accountability to the state in relation to their efforts to increase MassCore completion. As described in previous evaluation reports, however, many districts report a strong commitment to increasing MassCore completion rates, and many districts’ current reform efforts include initiatives intended to achieve this goal. Nonetheless, as also reported previously, structural barriers remain in many districts. Future analysis and reporting will provide more detailed findings from the data that ESE has provided, as well as from UMDI’s spring 2013 data collection from district data administrators.

Massachusetts Race to the Top College and Career Readiness Initiatives

Interim Evaluation Report, June 2013

Prepared for the Massachusetts Department of Elementary and Secondary Education

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# Introduction

The Massachusetts Department of Elementary and Secondary Education (ESE) was awarded a federal Race to the Top (RTTT) grant for the years 2010-2014. The college and career readiness (C&CR) components of the grant were designed to help students develop "knowledge and skills necessary for success in postsecondary education and economically viable career pathways." The RTTT initiatives are intended to provide students with opportunities to participate in quality, upper-level high school coursework and new approaches to assist them with high school completion and transition to higher education and the workforce. These programs are part of a broader effort, as specified in the Delivery Plan of ESE's College and Career Readiness group, to increase the Massachusetts 5-year high school graduation rate to 88.3% and the number of students who complete the MassCore program of study to 85.0% statewide.

The RTTT C&CR evaluation is being conducted by the UMass Donahue Institute (UMDI). This document is the second of a planned series of three reports for Year 3 of the evaluation (10/1/12 - 9/30/13), which are to be presented at the end of January, June, and September 2013. The primary purpose of the January and June reports is to provide ESE with timely information and feedback that can be used for program monitoring, improvement, and technical assistance. Different depths of information are provided for different programs, depending on the scope of each program, the timing of the Year 3 evaluation plan and availability of data sources, and UMDI’s understanding of the relative priority of each aspect of the evaluation. The comprehensive annual report in September will also provide a thorough description of background, methods, and findings.

# Pre-AP Teacher Training

**Methods**

This report includes information collected from the following data sources:

* *Survey of Pre-AP teachers and lead teachers.* An online survey was sent in May 2013 to all Pre-AP teachers and lead teachers who had completed at least one day of training (see survey in Appendix E).
* *Survey of Pre-AP administrators.* An online survey was sent in May 2013 to the primary Pre-AP program administrator of all Project 4D districts (see survey in Appendix F).
* *Training registration and attendance database.* MMSI developed and populated a database that tracked teacher, lead teacher, and administrator registration and attendance at Pre-AP training.
* *Vertical team meeting attendance database.* In collaboration with MMSI and ESE, UMDI developed and populated a database that tracked attendance at vertical team meetings. UMDI created a form for districts to report attendance and sent them reminders every two months to submit data updates as additional vertical team meetings were conducted.
* *ESE documents and databases.* ESE provided the state’s SIMS, SCS, and AP databases, as well as a spreadsheet that indicated which districts ESE has designated as Project 4D.
* *Communications.* UMDI communicated by email, phone, and interview with the ESE program manager and project director and the technical assistance vendor (MMSI).

Three site visit districts were selected based on criteria of highest priority to ESE: specifically, Project 4D districts in their second year of implementation with a large number of trained teachers and a high percentage of at-risk or high-need students. Each site focused on one of the three disciplines in which Pre-AP training is offered (i.e., ELA, mathematics, and science). Site visits included interviews with an administrator, the lead teacher, and two other teachers in a single academic discipline, as well as observations of a vertical team meeting and a teacher delivering an LTF lesson. The site visits took place from March through June, 2013. The third site was unable to schedule a site visit until mid-June, despite repeated requests, which did not leave time to synthesize the findings from the three sites for this report. Site visit finding will therefore be included in the annual report. Instruments for the site visit interviews and observations were included in the January, 2013 interim evaluation report.

**AP Course and Exam Participation and Success**

Two of the evaluation questions for the Pre-AP program are:

1. What percentage of “high-needs” students are currently enrolled in AP courses statewide and in each district, by content area?
2. What percentage of “high-needs” students currently score a 3 or better on an AP exam statewide and in each district, by content area?

Consistent with ESE’s definition, “high-needs” students were defined as those who in the current year are limited English proficiency, low-income, and/or special education students, or who in the two years prior to the current year were limited English proficiency students (i.e., former English language learners, or FELL).

For the first question, the datasets used were SCS (2012) and SIMS (October 2012, plus the two additional two years of SIMS datasets needed to determine student FELL status). The number of unique ELA, math, and science AP course sections offered in each district was identified based on a combination of the SCS course location, course code, and section number. Sections offered at colleges or online were excluded from section counts, but students who completed an AP course online or through a college were included in participant counts.

For the second question, the AP (2012) dataset was used in addition to the datasets used for the first question. Only students who had completed an ELA, math, or science AP exam were selected.

**Findings**

**AP Course Participation and Success**

This section presents and discusses statewide findings regarding AP course participation and success. District-level findings related to AP course participation and success are presented in a separate spreadsheet submitted to ESE with this report.

The table below shows the ratio of high-needs (HN) students to other students statewide who take and pass AP courses (by discipline). The “other” students will hereafter be referred to as “non-high-needs” (NHN) students. The findings are also presented for the following five subgroups of potential interest for assessing Pre-AP program impacts:

1. Students from Project 4D Districts
2. Students from Project 4D, Cohort 1 Districts
3. Students from Project 4D, Cohort 2 Districts
4. Students from Project 4D districts that are also participating in MMSI’s AP program
5. Students from districts participating in Pre-AP, but not Project 4D

Trends in these findings are discussed below. The trends have not been subject to significance testing, which would likely show “significance” for very small differences, due to the large sample size. Instead, findings are discussed that appear to convey useful information about the intervention, subgroups, or differences that appear meaningful.

The most apparent and predictable trend is that NHN students take and pass AP courses at much higher rates in all three disciplines than HN students. As shown in the table below, NHN students on average take and pass AP courses at three to four times the rate of HN students. This ratio is substantially lower in Project 4D districts for math (2.7 versus 3.5) and science (2.8 versus 3.8), but not for ELA (2.9 versus 2.8). These ratios are of course affected by changes in both the numerator and the denominator, so that, for example, increased AP course participation by HN students would not decrease the ratio if AP course participation by NHN students was increasing at the same rate.

| Rates of Taking ELA, Math, and Science AP Courses:  Ratio of Non-High-Needs Student Rates to High-Needs Student Rates | | | | |
| --- | --- | --- | --- | --- |
| District Grouping | ELA | Math | Science | Combined |
| Whole State | 2.8 | 3.5 | 3.8 | 3.2 |
| Project 4D | 2.9 | 2.7 | 2.8 | 2.7 |
| 4D, Cohort 1 | 3.0 | 2.4 | 2.2 | 2.5 |
| 4D, Cohort 2 | 3.2 | 3.3 | 4.0 | 3.1 |
| 4D & AP | 2.9 | 2.4 | 2.4 | 2.5 |
| Pre-AP, Not 4D | 3.5 | 4.3 | 4.1 | 3.8 |

The next table provides additional information regarding AP course participation and success for HN and NHN students across the same disciplines and district groupings presented in the previous table. More detailed explanations of the table’s column headings are as follows:

1. # Taking Course – The number of high school students in the district grouping taking at least one AP course in the given discipline or group of disciplines.
2. % Taking Course – The percentage of high school students taking at least one AP course in the given discipline or group of disciplines.
3. % of Takers Passing – The percentage of “# Taking Course” who completed and passed the course.
4. % of all HN (or NHN) Passing – The percentage of high school students who completed and passed at least one AP course in the given discipline or group of disciplines.

One finding from the table that is notable for its consistency is that for all three disciplines, and for the three disciplines combined, the percentage of HN students taking AP courses goes in the following order, from highest to lowest (disregarding two “ties”):

1. Project 4D plus AP
2. Project 4D, Cohort 1
3. Project 4D, All[[3]](#footnote-3)
4. Project 4D, Cohort 2
5. Whole State
6. Pre-AP, not 4D

This pattern also holds in most cases with regard to the percentage of all HN students passing AP courses. These findings provide a pattern that would make sense if the Pre-AP and AP interventions are having their intended impacts (although there are also plausible alternative explanations, to be explored below). First, HN students in districts that have both the Pre-AP and AP programs are taking the most AP courses. Second, Cohort 1 districts have been engaged in the Pre-AP program for longer than Cohort 2 districts, and HN students from Cohort 1 districts are taking more AP courses than HN students from Cohort 2

| Number and Percentage of High-Needs and Non-High-Needs Students Taking AP Courses SY2011–12, by District Grouping | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| AP  Course  Subject | District Grouping | High-Needs | | | | Non-High-Needs | | | |
| # Taking Course | % Taking Course | % of Takers Passing | % of All HN Passing | # Taking Course | % Taking Course | % of Takers Passing | % of All NHN Passing |
| ELA | Whole State | 2810 | 2.3 | 91.4 | 2.1 | 10568 | 6.5 | 94.4 | 6.1 |
| Project 4D | 1400 | 3.5 | 92.1 | 3.2 | 2625 | 10.2 | 93.5 | 9.6 |
| 4D, Cohort 1 | 953 | 4.0 | 92.3 | 3.7 | 1394 | 11.8 | 94.0 | 11.1 |
| 4D, Cohort 2 | 447 | 2.8 | 91.7 | 2.5 | 1231 | 8.9 | 93.0 | 8.3 |
| 4D & AP | 1262 | 4.7 | 92.0 | 4.3 | 1813 | 13.6 | 91.8 | 12.5 |
| Pre-AP, Not 4D | 554 | 2.2 | 87.7 | 2.0 | 1584 | 7.8 | 95.6 | 7.4 |
| Math | Whole State | 2229 | 1.8 | 88.5 | 1.6 | 10254 | 6.3 | 93.2 | 5.8 |
| Project 4D | 917 | 2.3 | 89.2 | 2.1 | 1601 | 6.2 | 89.1 | 5.6 |
| 4D, Cohort 1 | 603 | 2.6 | 91.0 | 2.3 | 741 | 6.3 | 93.3 | 5.8 |
| 4D, Cohort 2 | 314 | 1.9 | 85.7 | 1.7 | 860 | 6.2 | 85.5 | 5.3 |
| 4D & AP | 772 | 2.9 | 88.6 | 2.6 | 939 | 7.0 | 84.2 | 5.9 |
| Pre-AP, Not 4D | 402 | 1.6 | 88.1 | 1.4 | 1412 | 6.9 | 95.0 | 6.6 |
| Science | Whole State | 2061 | 1.7 | 87.3 | 1.5 | 10693 | 6.5 | 93.5 | 6.1 |
| Project 4D | 961 | 2.4 | 89.1 | 2.2 | 1696 | 6.6 | 94.2 | 6.2 |
| 4D, Cohort 1 | 693 | 2.9 | 89.8 | 2.6 | 754 | 6.4 | 95.0 | 6.1 |
| 4D, Cohort 2 | 268 | 1.7 | 87.3 | 1.5 | 942 | 6.8 | 93.5 | 6.4 |
| 4D & AP | 803 | 3.0 | 88.2 | 2.6 | 946 | 7.1 | 91.5 | 6.5 |
| Pre-AP, Not 4D | 363 | 1.5 | 83.2 | 1.2 | 1261 | 6.2 | 93.2 | 5.8 |
| ELA,  Math, and Science Combined | Whole State | 5434 | 4.4 | 89.6 | 3.9 | 23263 | 14.2 | 94.2 | 13.4 |
| Project 4D | 2514 | 6.3 | 90.7 | 5.7 | 4302 | 16.7 | 92.9 | 15.6 |
| 4D, Cohort 1 | 1710 | 7.3 | 91.8 | 6.7 | 2140 | 18.1 | 94.2 | 17.1 |
| 4D, Cohort 2 | 804 | 5.0 | 88.3 | 4.4 | 2162 | 15.6 | 91.7 | 14.3 |
| 4D & AP | 2175 | 8.1 | 90.3 | 7.3 | 2673 | 20.0 | 90.3 | 18.1 |
| Pre-AP, Not 4D | 1015 | 4.1 | 87.7 | 3.6 | 3137 | 15.4 | 95.3 | 14.7 |

districts. Third, districts that are Pre-AP but not Project 4D, which have typically received a lower “dosage” of the Pre-AP program and have invested fewer resources in the Pre-AP program, have lower rates of AP course participation than Project 4D districts.

The pattern described above does not apply to the percentage of AP course-takers that pass their courses, likely in part because there is substantially less variation in pass rates than in course participation rates. Two findings that stand out with regard to the percentage of HN course-takers passing are: (1) passing rates are five percentage points higher for Cohort 1 than for Cohort 2 math students; and (2) passing rates for Pre-AP, non-4D students are four percentage points below the state average.

While aspects of the findings presented are consistent with the effectiveness of the Pre-AP program, plausible alternative explanations make additional data collection and analysis necessary. First, the AP program may account for any impacts that are observed in districts that are participating in both the Pre-AP and AP programs. Second, the reported differences in AP course participation rates in Cohort 1, Cohort 2, and Pre-AP, non-4D districts may reflect differences that existed prior to the Pre-AP program, both in terms of actual AP course participation and in terms of the districts’ commitment to increasing AP course participation. As further discussed in the strategic considerations section, UMDI will be proposing a substantial focus during the evaluation’s final year on conducting analyses that provide the strongest answers to these questions that the data and evaluation resources can provide.

**AP Exam Taking and Success**

This section presents and discusses statewide findings regarding AP exam taking and success. District-level findings related to AP exam taking and success are presented in a separate spreadsheet submitted to ESE with this report.

The table below shows the ratio of high-needs (HN) students to other students statewide who take and pass AP exams (by discipline), and for the same five subgroups as in the previous section. As with course-taking, NHN students take AP exams in ELA, math, and science on average at three to four times the rate of HN students. This ratio is substantially lower in Project 4D districts for math (3.9 versus 2.9) and science (4.3 versus 2.7), but not for ELA (3.1 versus 3.2). Moreover, the ratio is substantially lower in all three disciplines for Cohort 1 districts than for Cohort 2 districts.

The disparity is even greater with regard to exam performance, with NHN students earning a score of three or higher at six to seven times the rate of HN students. As with exam-taking rates, this ratio is substantially lower in Project 4D districts for math (6.1 versus 4.6) and science (6.8 versus 4.4), and in this case it is somewhat higher for ELA (5.6 versus 6.1). Also, as with exam-taking rates, the ratio is substantially lower in all three disciplines for Cohort 1 districts than for Cohort 2 districts.

| Rates of Taking and Scoring ≥ 3 on AP ELA, Math, and Science Exams:  Ratio of Non-High-Needs Student Rates to High-Needs Student Rates | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| District Grouping | Take Exam | | | | Score ≥ 3 | | | |
| ELA | Math | Science | Combined | ELA | Math | Science | Combined |
| Whole State | 3.1 | 3.9 | 4.3 | 3.5 | 5.6 | 6.1 | 6.8 | 5.9 |
| Project 4D | 3.2 | 2.9 | 2.7 | 2.9 | 6.1 | 4.6 | 4.4 | 4.6 |
| 4D, Cohort 1 | 3.0 | 2.4 | 2.1 | 2.5 | 5.3 | 3.3 | 3.1 | 3.8 |
| 4D, Cohort 2 | 4.0 | 3.5 | 4.2 | 3.6 | 7.2 | 7.2 | 6.5 | 6.5 |
| 4D & AP | 3.1 | 2.6 | 2.4 | 2.6 | 5.9 | 4.3 | 3.8 | 4.4 |
| Pre-AP, Not 4D | 3.4 | 4.3 | 4.7 | 3.8 | 6.2 | 7.0 | 9.0 | 6.5 |

The next table provides additional information regarding AP exam participation and success for HN and NHN students across the same disciplines and district groupings presented in the previous table. More detailed explanations of the table’s column headings are as follows:

1. # Taking Exam – The number of high school students in the district grouping taking at least one AP exam in the given discipline or group of disciplines.
2. % Taking Exam – The percentage of high school students taking at least one AP exam in the given discipline or group of disciplines.
3. % of Takers Scoring ≥ 3 – The percentage of “# Taking Exam” who scored a three or higher on the exam.
4. % of all HN (or NHN) Scoring ≥ 3 – The percentage of high school students who scored a three or higher on at least one AP exam in the given discipline or group of disciplines.

A notable finding from the table is that the highest AP exam-taking rates for all three disciplines, and for the three disciplines combined, are for (1) districts that are participating in both the Pre-AP and AP programs, followed (or in one case equaled) by (2) Project 4D Cohort 1 districts, and then by (3) all Project 4D districts combined. After that, the order becomes less consistent across district groupings.

With regard to the percentage of HN test takers scoring greater than or equal to a three, two notable findings are that (1) for all three disciplines, the state is higher than any of the district subgroups; and (2) the districts with both AP and pre-AP are lowest or second lowest across all three disciplines. This finding can be interpreted in the context of a comment made by a MMSI personnel member during an interview with UMDI for the AP (not Pre-AP) program evaluation. He said that the AP program attempts to substantially increase participation in AP courses and exams, and to maximize the number rather than the percentage of students scoring a three or higher. His comments suggested that many districts have barriers to participation in AP courses and exams that narrow participation to students who have completed and/or earned high grades in challenging prerequisite courses. Those strategies—which reduce participation but maximize the qualifications of participants—could yield the pattern of data presented here, where the statewide rate is higher than the Pre-AP and AP rates.

With regard to the percentage of all HN students (i.e., not just HN test takers) scoring a three or higher, the two highest groupings for all three disciplines are again the Cohort 1 and the districts combining AP and Pre-AP. This pattern would also be consistent with the scenario just described, where the goal is to maximize the number rather than the percentage of high scorers.

| Number and Percentage of High-Need and Non-High-Need Students Taking AP Exams SY2011–12, by District Grouping | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| AP  Course  Subject | District Grouping | High-Needs | | | | Non-High-Needs | | | |
| # Taking Exam | % Taking Exam | % of Takers Scoring ≥ 3 | % of All HN  Scoring ≥ 3 | # Taking Exam | % Taking Exam | % of Takers Scoring ≥ 3 | % of All NHN  Scoring ≥ 3 |
| ELA | Whole State | 2569 | 2.1 | 41.7 | 0.9 | 10737 | 6.6 | 76.5 | 5.0 |
| Project 4D | 1249 | 3.1 | 36.0 | 1.1 | 2575 | 10.0 | 67.0 | 6.7 |
| 4D, Cohort 1 | 872 | 3.7 | 35.6 | 1.3 | 1309 | 11.1 | 62.4 | 6.9 |
| 4D, Cohort 2 | 377 | 2.3 | 37.1 | 0.9 | 1266 | 9.1 | 71.6 | 6.5 |
| 4D & AP | 1123 | 4.2 | 34.4 | 1.4 | 1722 | 12.9 | 63.9 | 8.2 |
| Pre-AP, Not 4D | 609 | 2.5 | 37.1 | 0.9 | 1716 | 8.4 | 66.6 | 5.6 |
| Math | Whole State | 1881 | 1.5 | 48.3 | 0.7 | 9456 | 5.8 | 74.4 | 4.3 |
| Project 4D | 800 | 2.0 | 38.3 | 0.8 | 1495 | 5.8 | 63.7 | 3.7 |
| 4D, Cohort 1 | 531 | 2.3 | 38.6 | 0.9 | 667 | 5.6 | 53.1 | 3.0 |
| 4D, Cohort 2 | 269 | 1.7 | 37.5 | 0.6 | 828 | 6.0 | 72.2 | 4.3 |
| 4D & AP | 672 | 2.5 | 37.1 | 0.9 | 867 | 6.5 | 59.6 | 3.9 |
| Pre-AP, Not 4D | 361 | 1.5 | 43.8 | 0.6 | 1311 | 6.4 | 65.0 | 4.2 |
| Science | Whole State | 1777 | 1.4 | 40.8 | 0.6 | 9830 | 6.0 | 68.9 | 4.1 |
| Project 4D | 862 | 2.2 | 37.8 | 0.8 | 1536 | 6.0 | 59.0 | 3.5 |
| 4D, Cohort 1 | 626 | 2.7 | 37.7 | 1.0 | 667 | 5.6 | 54.6 | 3.1 |
| 4D, Cohort 2 | 236 | 1.5 | 38.1 | 0.6 | 869 | 6.3 | 62.4 | 3.9 |
| 4D & AP | 720 | 2.7 | 37.5 | 1.0 | 882 | 6.6 | 57.9 | 3.8 |
| Pre-AP, Not 4D | 291 | 1.2 | 21.6 | 0.3 | 1136 | 5.6 | 49.2 | 2.7 |
| ELA,  Math, and Science Combined | Whole State | 4717 | 3.8 | 45.5 | 1.7 | 21940 | 13.4 | 74.8 | 10.0 |
| Project 4D | 2203 | 5.5 | 39.3 | 2.2 | 4035 | 15.7 | 65.1 | 10.2 |
| 4D, Cohort 1 | 1533 | 6.5 | 39.3 | 2.6 | 1954 | 16.5 | 60.4 | 10.0 |
| 4D, Cohort 2 | 670 | 4.2 | 39.4 | 1.6 | 2081 | 15.0 | 69.6 | 10.4 |
| 4D & AP | 1910 | 7.1 | 38.4 | 2.7 | 2506 | 18.8 | 62.8 | 11.8 |
| Pre-AP, Not 4D | 959 | 3.9 | 38.0 | 1.5 | 3016 | 14.8 | 65.2 | 9.7 |

**Teacher and Lead Teacher Survey**

The Pre-AP Teacher Survey (Appendix E) was sent to the 1,311 teachers (1,046 4D and 265 non-4D) who had attended at least one day of Pre-AP training. Email addresses for 31 were non-deliverable, and 27 had opted out of the survey software on previous surveys, so the survey reached 1,253 teachers, with a response rate of 40% (N=504; 429 4D and 75 non-4D). The survey included a section for lead teachers, and 66 of the 4D respondents and 5 of the non-4D respondents indicated that they were lead teachers. Due to the much greater number of trained teachers, this year’s survey had substantially more respondents than last year’s survey (504 vs. 139 teachers; 66 vs. 31 lead teachers).

**Teacher background.** Respondents were asked to provide their number of years as a certified teacher, and the average was 14 years (range 0 to 40). They were also asked their number of years as a certified teacher in their current school, and the average was 9 years (range 0 to 40). Their primary teaching assignments were: mathematics (38%), English language arts (35%), biology (6%), chemistry (3%), physics (2%), other sciences (7%, including earth, life, physical, and environmental), special education (2%), and one percent each for computer science, ESL, elementary, history, and social studies. The majority of teachers reported teaching at multiple grade levels, as shown in the table below, with the largest group of teachers being in the high school grades. For both academic disciplines and grade levels the total exceeds 100%, because some teachers responded in multiple categories.

|  |  |  |
| --- | --- | --- |
| **The grade level of your primary teaching assignment** | | |
| **Survey Item** | **N** | **(%)** |
| 4th Grade | 3 | 1 |
| 5th Grade | 13 | 3 |
| 6th Grade | 82 | 16 |
| 7th Grade | 100 | 20 |
| 8th Grade | 106 | 21 |
| 9th Grade | 128 | 25 |
| 10th Grade | 151 | 30 |
| 11th Grade | 147 | 29 |
| 12th Grade | 141 | 28 |
| Special Education | 36 | 7 |
| Classroom aide | 1 | 1 |
| ESL Specialist | 11 | 2 |
| Other | 23 | 5 |

The remaining tables report the responses of 4D and non-4D teachers separately. The narrative part of the text will focus on the 4D responses.

**Teacher training.** The table below suggests that most survey respondents have been trained for one or two years, based on the definition that being “trained” requires completing at least three days of a given’s year’s training (i.e., Part 1, Part 2, or Part 3). Assuming that those who have completed 3 or 4 days of training have completed Part 1, and those who have completed 7 or 8 days of training have completed Part 2, then 87% of Project 4D respondents have completed 1 or 2 years of training.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **How many days of MMSI Pre-AP training have you attended?** | | | | |
| **# of Days** | **4D** | | **Non-4D** | |
| **%** | **N** | **%** | **N** |
| 0 | 0 | 1 | 1 | 1 |
| 1 | 1 | 3 | 6 | 4 |
| 2 | 0 | 2 | 3 | 2 |
| 3 | 4 | 16 | 10 | 7 |
| 4 | 49 | 197 | 41 | 28 |
| 5 | 8 | 31 | 12 | 8 |
| 6 | 4 | 16 | 0 | 0 |
| 7 | 3 | 14 | 1 | 1 |
| 8 | 31 | 123 | 26 | 18 |

Most 4D teachers (87%) reported that they intend to complete all three years (12 total days) of Pre-AP training, which is the commitment districts make when using 4D funds. A smaller group of non-4D teachers (66%) made that commitment.

**Pre-AP implementation.** The table below reports responses to several teacher survey items regarding Pre-AP implementation during the 2012–13 school year. As reported last year, non-4D respondents, who are not required by the Pre-AP project to participate in vertical team meetings, nonetheless reported having participated in an average of 1.8 such meetings. A notable finding is that 4D teachers reported accessing online materials from the LTF website an average of 10.5 times, compared to 5.5 times in last year’s survey. (No substantial change was noted for non-4D teachers.)

Another notable change was with regard to the number of LTF lessons that teachers were expected or required to implement. Though there was a slight difference in the phrasing of this question last year, the shift in responses seems meaningful nonetheless. Last year teachers were asked, “How many LTF lessons and assessments has your school or district told you that you must implement during this school year?”; they reported a mean of 2.4. This year teachers were asked, “What is the minimum number of LTF lessons and/or assessments that your school or district expects you to implement during this school year?”; the reported mean was 6.0. Despite the differences in the questions, it appears that the expectation has increased.

|  |  |  |
| --- | --- | --- |
| **Pre-AP Implementation During the 2012–13 School Year** | | |
| **Survey Item** | **4D** | **Mean** |
| Number of times participated in a Pre-AP Vertical Team meeting | Y  N | 2.8  1.8 |
| Number of times met with other teachers in your discipline to jointly develop Pre-AP lessons and assessments. | Y  N | 4.6  4.3 |
| Number of times accessed online materials from the LTF website | Y  N | 10.5  6.7 |
| Number of times participated or reviewed discussions in an LTF or MMSI online forum | Y  N | 0.7  1.4 |
| Number of times observed another teacher or team of teachers presenting an LTF lesson in their classroom | Y  N | 1.0  0.9 |
| What is the minimum number of LTF lessons and/or assessments that your school or district expects you to implement during this school year? | Y  N | 6.0  1.8 |
| On average, how many hours of class time have you needed to spend in order to implement one LTF lesson? | Y  N | 3.1  2.2 |
| Please think about the class (or classes) in which you have implemented the most LTF lessons during the 2012-13 school year. How many LTF lessons have you implemented in that class during the school year? | Y  N | 5.8  6.4 |
| For that same class, how many LTF assessments have you implemented this school year? | Y  N | 2.5  3.1 |

**Changes in teaching practices.** Teachers were asked about the impacts of their participation in Pre-AP training, and responses are shown in the table below. In the 4D group, 70% or more of teachers agreed that, as a result of the Pre-AP training, they now teach more Pre-AP content (75%), use more Pre-AP pedagogical strategies in the classroom (74%), have improved their content knowledge in their primary discipline (71%), and have greater awareness of the importance of using Pre-AP strategies (83%). A smaller but still substantial number agreed that they now use more Pre-AP assessment strategies (52%), that they have changed their teaching philosophy to be more consistent with the Pre-AP program (56%), and that implementing LTF lessons and assessments represents a substantial change to their teaching practice (49%). Just 31% agreed that they use more technology in the classroom as a result of participating in Pre-AP training.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Impacts of MMSI Pre-AP Training** | | | | | | | |
| **Survey Item** | **4D** | **N** | **Strongly Agree**  **(%)** | **Agree**  **(%)** | **Neutral**  **(%)** | **Disagree**  **(%)** | **Strongly Disagree**  **(%)** |
| As a result of participating in the MMSI Pre-AP training, I now teach more Pre-AP content. | Y  N | 423  73 | 23  21 | 52  56 | 17  18 | 6  4 | 2  1 |
| As a result of participating in the MMSI Pre-AP training, I now use more Pre-AP pedagogical strategies in the classroom. | Y  N | 418  73 | 22  21 | 52  55 | 19  19 | 5  4 | 2  1 |
| As a result of participating in the MMSI Pre-AP training, I now use more Pre-AP assessment strategies. | Y  N | 412  72 | 14  13 | 40  38 | 32  41 | 11  7 | 3  1 |
| As a result of participating in the MMSI Pre-AP training, I now use more technology in the classroom. | Y  N | 418  72 | 9  11 | 22  23 | 42  46 | 22  17 | 5  3 |
| As a result of participating in the MMSI Pre-AP training, I have improved my own content knowledge in the academic discipline that was the focus of my Pre-AP training. | Y  N | 423  72 | 23  21 | 48  40 | 19  29 | 7  6 | 3  4 |
| As a result of participating in the MMSI Pre-AP training, my teaching philosophy has changed to be more consistent with that of the MMSI Pre-AP program. | Y  N | 422  73 | 15  11 | 41  48 | 34  30 | 8  8 | 2  3 |
| As a result of participating in the MMSI Pre-AP training, my awareness of the importance of using Pre-AP strategies has increased. | Y  N | 421  73 | 27  32 | 56  51 | 12  11 | 3  5 | 2  1 |
| Implementing LTF lessons and/or assessments represents a substantial change to my teaching practice. | Y  N | 422  73 | 12  11 | 37  27 | 36  44 | 12  17 | 3  1 |

**Relevance and effectiveness.** Teachers were asked about the relevance and effectiveness of the Pre-AP program, and responses are shown in the table below. Sixty-two percent of teachers agreed that implementing LTF lessons brings greater relevance to their classrooms. Most teachers agreed that the Pre-AP program will be effective in improving students' preparedness for success in AP-level coursework (83%) and college coursework (83%).

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Relevance and Effectiveness of the Pre-AP Program** | | | | | | | |
| **Survey Item** | **4D** | **N** | **Strongly Agree**  **(%)** | **Agree**  **(%)** | **Neutral**  **(%)** | **Disagree**  **(%)** | **Strongly Disagree**  **(%)** |
| 1. Implementing LTF lessons brings greater relevance to my classroom activities than in the past. | Y  N | 403  70 | 15  17 | 47  36 | 25  31 | 10  16 | 3  0 |
| 2. The Pre-AP program will be effective in improving students' preparedness for success in AP-level coursework. | Y  N | 408  72 | 28  28 | 55  58 | 13  10 | 2  3 | 2  1 |
| 3. The Pre-AP program will be effective in improving students' preparedness for success in college coursework. | Y  N | 410  71 | 30  30 | 53  58 | 15  8 | 1  3 | 1  1 |
| Response options also included “not applicable” and “don’t know.” The percentages of respondents who selected those choices are listed below, but those respondents were not used to calculate the percentages reported in the table. Q1. 4D: 3% NA, 1% DK, Non-4D: 3% NA, 3% DK. Q2. 4D: 1% NA, 2% DK, Non-4D: 1% NA, 1% DK. Q3. 4D: 1% NA, 2% DK, Non-4D: 0% NA, 4% DK. | | | | | | | |

**Collaboration with colleagues.** As shown in the table below, teacher survey respondents reported that collaboration with colleagues to develop Pre-AP lessons and/or assessments was most common with same-department colleagues, whether the colleagues were Pre-AP trained (59% agree or strongly agree) or not (46%). Such collaboration was lower with colleagues in other schools (30%).

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Collaboration With Colleagues** | | | | | | | |
| **Survey Item** | **4D** | **N** | **Strongly Agree**  **(%)** | **Agree**  **(%)** | **Neutral**  **(%)** | **Disagree**  **(%)** | **Strongly Disagree**  **(%)** |
| I actively collaborate with Pre-AP trained colleagues in my department to develop Pre-AP lessons and/or assessments. | Y  N | 419  73 | 18  11 | 41  36 | 20  23 | 17  18 | 4  12 |
| I actively collaborate with colleagues in my department who aren’t Pre-AP trained to develop Pre-AP lessons and/or assessments. | Y  N | 418  73 | 12  12 | 34  33 | 26  32 | 23  15 | 5  8 |
| I actively collaborate with colleagues in other schools in my district to develop Pre-AP lessons and/or assessments. | Y  N | 419  71 | 8  4 | 22  11 | 27  27 | 31  37 | 12  21 |

**Resources and supports.** Several teacher survey items, shown in the table below, asked teachers about the adequacy of their resources and supports, as well as the preparation of their students. With regard to their ability to implement Pre-AP lessons and/or assessments, 68% agreed that they had adequate curricular resources, 53% that they had adequate classroom equipment and supplies, and 55% that they had long enough class periods. Just 34% reported that they had adequate planning time and 33% that they had sufficient time to share Pre-AP approaches with same-discipline colleagues. Seventy-eight percent agreed that they had full administrative support to integrate Pre-AP lessons into their teaching, and 57% agreed that they could implement Pre-AP activities and still adhere to the district’s pacing guide. Just 35% of teachers agreed that their students had sufficient academic preparation to participate in the Pre-AP lessons and/or assessments that are targeted to their grade level.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Pre-AP Program Resources and Supports** | | | | | | | |
| **Survey Item** | **4D** | **N** | **Strongly Agree**  **(%)** | **Agree**  **(%)** | **Neutral**  **(%)** | **Disagree**  **(%)** | **Strongly Disagree**  **(%)** |
| I have access to adequate curricular resources to implement Pre-AP lessons and/or assessments. | Y  N | 420  74 | 19  15 | 49  50 | 16  15 | 12  17 | 4  3 |
| I have adequate classroom equipment and supplies to implement Pre-AP lessons and/or assessments. | Y  N | 417  73 | 12  10 | 41  44 | 19  18 | 22  24 | 6  4 |
| I have adequate planning time to prepare new Pre-AP lessons and/or assessments. | Y  N | 417  72 | 3  6 | 31  36 | 26  21 | 30  26 | 10  11 |
| My school provides adequate planning time for same-discipline teachers to share their Pre-AP approaches with each other. | Y  N | 419  73 | 5  11 | 28  24 | 21  14 | 33  29 | 13  22 |
| Class periods are long enough to provide adequate time for my students to perform Pre-AP activities. | Y  N | 413  73 | 10  12 | 45  30 | 15  28 | 23  19 | 7  11 |
| I can implement Pre-AP activities with my students and still adhere to my district’s pacing guide. | Y  N | 420  73 | 11  14 | 46  33 | 25  23 | 12  23 | 6  7 |
| My administrators fully support my integration of Pre-AP lessons and assessments into my teaching. | Y  N | 416  72 | 33  28 | 45  44 | 17  20 | 3  8 | 2  0 |
| My students have sufficient academic preparation to participate in the Pre-AP lessons and/or assessments that are targeted to their grade level. | Y  N | 420  73 | 6  7 | 29  33 | 25  22 | 31  27 | 9  11 |

**Alignment, scaffolding, and differentiation.** Eighty-six percent of teachers agreed that the LTF curriculum is well aligned with the Common Core standards, 82% of teachers agreed that the connections between the LTF curriculum and the Common Core are well specified, and 88% of teachers agreed that the LTF lessons and assessments are examples of high-quality pedagogical practices in their content area. With regard to scaffolding, 82% of teachers agreed that they needed to create supplemental activities to introduce or otherwise scaffold aspects of LTF lessons, but also that the discussion of scaffolding during summer training (59%) and vertical team meetings (54%) supports their implementation of LTF lessons and assessments. About half of the teachers (53%) agreed that the LTF lessons and assessments provide appropriate supports for differentiation for students across a wide range of skill levels.

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| **LTF Alignment, Scaffolding, and Differentiation** | | | | | | | |
| **Survey Item** | **4D** | **N** | **Strongly Agree**  **(%)** | **Agree**  **(%)** | **Neutral**  **(%)** | **Disagree**  **(%)** | **Strongly Disagree**  **(%)** |
| 1. The LTF lessons and assessments are well aligned with the Common Core standards for my content area. | Y  N | 405  66 | 29  36 | 57  47 | 11  12 | 2  5 | 1  0 |
| 2. The connections between the LTF lessons and assessments and the Common Core standards are well specified for my content area. | Y  N | 399  66 | 27  30 | 55  42 | 13  20 | 4  8 | 1  0 |
| 3. The LTF lessons and assessments are examples of high-quality pedagogical practices in my content area. | Y  N | 412  70 | 33  33 | 55  50 | 10  10 | 1  7 | 1  0 |
| 4. LTF lessons and assessments provide appropriate supports for differentiation for students across a wide range of skill levels. | Y  N | 411  72 | 14  14 | 39  39 | 24  35 | 17  11 | 6  1 |
| 5. In order to implement a typical LTF lesson, I need to create supplemental activities to introduce or otherwise scaffold aspects of the LTF lesson. | Y  N | 410  71 | 26  13 | 56  56 | 11  17 | 6  14 | 1  0 |
| 6. The discussion of scaffolding during summer training supports the implementation of the LTF lessons and assessments in my classroom. | Y  N | 379  62 | 14  13 | 45  43 | 30  31 | 8  13 | 3  0 |
| 7. The discussion of scaffolding during vertical team meetings supports the implementation of the LTF lessons and assessments in my classroom. | Y  N | 363  52 | 11  10 | 43  40 | 35  35 | 7  11 | 4  4 |
| Response options also included “not applicable” and “don’t know.” The percentages of respondents who selected those choices are listed below, but those respondents were not used to calculate the percentages reported in the table. Q1. 4D: 2% NA, 2% DK, Non-4D: 0% NA, 10% DK. Q2. 4D: 2% NA, 3% DK, Non-4D: 0% NA, 11% DK. Q3. 4D: 1% NA, 0% DK, Non-4D: 0% NA, 5% DK. Q4. 4D: 1% NA, 1% DK, Non-4D: 0% NA, 3% DK. Q5. 4D: 2% NA, 0% DK, Non-4D: 0% NA, 3% DK. Q6. 4D: 6% NA, 4% DK, Non-4D: 5% NA, 10% DK. Q7. 4D: 10% NA, 4% DK, Non-4D: 22% NA, 8% DK. | | | | | | | |

**Lead teacher training and support.** Lead teachers were asked a series of questions that were not asked of other teachers. First, when asked about lead teacher training, as shown in the table below, 70% of lead teacher survey respondents agreed that the summer lead teacher training had been helpful in supporting their work as a lead teacher, 63% agreed that the summer lead teacher training was engaging, and 70% agreed that the training was well executed. (In last year’s survey, 80% agreed that the training was well executed.)

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| **Lead Teacher Training** | | | | | | |
| **Survey Item** | **N** | **Strongly Agree**  **(%)** | **Agree**  **(%)** | **Neutral**  **(%)** | **Disagree**  **(%)** | **Strongly Disagree**  **(%)** |
| 1. The lead teacher training session was helpful in supporting what I need to do as a lead teacher. | 48 | 10 | 60 | 19 | 9 | 2 |
| 2. The lead teacher training session was engaging. | 48 | 13 | 50 | 25 | 8 | 4 |
| 3. Overall, the lead teacher training session was well executed. | 48 | 11 | 58 | 21 | 8 | 2 |
| Response options also included “not applicable.” The percentage of respondents who selected those choices are listed below, but those respondents were not used to calculate the percentages reported in the table. Q1. 4%, Q2. 4%, Q3. 4%. | | | | | | |

Lead teachers were asked about the support provided by MMSI. As shown in the table below, 76% agreed that they have been satisfied with the support they received when they requested it. Of those lead teachers whose districts had held vertical team meetings, 68% agreed that the materials and activities provided by MMSI for structuring a vertical team meeting were effective in achieving the goals of the meeting. (In last year’s survey, 57% agreed with that item.) Of those whose district had held a vertical team meeting, 52% agreed that the support provided by MMSI for structuring and running vertical team meetings had helped them to develop leadership skills.

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| **MMSI Support for Lead Teachers and Vertical Team Meetings** | | | | | | |
| **Survey Item** | **N** | **Strongly Agree**  **(%)** | **Agree**  **(%)** | **Neutral**  **(%)** | **Disagree**  **(%)** | **Strongly Disagree**  **(%)** |
| 1. When I have requested support from MMSI, I have been satisfied with the support I received. | 55 | 29 | 47 | 22 | 0 | 2 |
| 2. The support provided by MMSI for structuring and running vertical team meetings has helped me develop my leadership skills. | 63 | 11 | 41 | 41 | 5 | 2 |
| 3. The materials and activities provided by MMSI for structuring a Vertical Team Meeting are effective in achieving the goals of the meeting. | 63 | 9 | 59 | 28 | 2 | 2 |
| Response options for Q2 and Q3 also included the statement, “We have not held a vertical team meeting.” The percentages of respondents who selected that option are listed below, but those respondents were not used to calculate the percentages reported in the table. Q2. 1%. Q3. 1%. | | | | | | |

Finally, as shown in the table below, 77% of lead teachers agreed that they have been satisfied with the support they have received from MMSI, but only 43% agreed that they have adequate time to fulfill the role of lead teacher.

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| --- | --- | --- | --- | --- | --- | --- |
| **MMSI Support Satisfaction and Lead Teacher Time Available** | | | | | | |
| **Survey Item** | **N** | **Strongly Agree**  **(%)** | **Agree**  **(%)** | **Neutral**  **(%)** | **Disagree**  **(%)** | **Strongly Disagree**  **(%)** |
| 1. When I have requested support from MMSI, I have been satisfied with the support I received. | 62 | 29 | 48 | 21 | 2 | 0 |
| 2. I have adequate time to fulfill the role of lead teacher. | 63 | 11 | 32 | 30 | 18 | 9 |
| Response options also included “not applicable.” The percentages of respondents who selected that choice are listed below, but those respondents were not used to calculate the percentages reported in the table. Q1. 16%, Q2. 10%. | | | | | | |

Teachers were also asked to respond to four open-ended questions, and their responses are summarized below.

**Implementation challenges.** Respondents were asked to identify factors that significantly challenge their ability to implement Pre-AP lessons and/or assessments, and 166 teachers provided comments. The most common challenge reported was that the Pre-AP content was much too difficult for their students (N=56). However, some teachers reported that they were working through these challenges by scaffolding, modifying, and guiding students (N=17), and by teaching one Pre-AP lesson over the course of several days, or only using parts of a Pre-AP lesson (N=8). Respondent comments included:

I have enjoyed the activities that I have used so far, but I have experienced some difficulty with the content of the activities. Students are not used to being faced with challenges, and typically shut down once they come across something they do not know how to do. Rather than work through a problem, they become stubborn and quit. Once the students get used to seeing these types of activities, and realize that they will need to explore these topics, I hope that this issue gets easier.

I teach grade 6 and find myself having to modify a lot of the materials. The materials are definitely accessible for my advanced students, but lower-level students have a hard time with them. Through modifications and chunking, my lower-level students have found success in completing Pre-AP activities.

Time was the second most common challenge (N=44). Some respondents said that they did not have common planning time (N=16), while others said that it was challenging to balance Pre-AP work with competing demands (N=5). As one respondent said,

I have found it difficult to implement Pre-AP strategies in the classrooms, because I only have students for a 14-week period. This forces me to hurry through the required texts that we must read. I also feel pressure to constantly work on preparing my students for the MCAS and the SAT, and this takes up time in class also.

Inadequate equipment and technology was also cited as a major challenge (N=31). Common issues included a lack of access to computers and calculators, and purchasing materials out-of-pocket. One respondent states, “Lack of school-provided resources is a problem as I purchase materials needed out-of-pocket. Some activities I cannot do, simply because of not having the equipment needed, and it's too expensive to purchase.”

Respondents reported that meeting the various expectations of the Common Core, district curriculum, and LTF lessons was a challenge (N=26). Some respondents said that Pre-AP strategies were not consistently being used in the district and school, that the district needs to adjust curriculum maps to incorporate both Common Core and Pre-AP curriculum, or that there were just simply too many initiatives. One respondent said, “I think that the teachers are so overwhelmed with the implementation and planning of the Common Core standards into their lessons and activities that they are less likely to adopt something they are not familiar with.” Another said, “With CCSS now in place, there is a delicate balance that must be met to not only implement Pre-AP lessons, but also to stay on track with the pacing of the course to ensure all curriculum standards are met by the end of the year.”

Some respondents reported that their administration has failed to provide any real support for Pre-AP implementation (N=13). An additional eight respondents reported that only one or two people in their districts were trained, making it challenging to implement Pre-AP lessons in the school. One teacher said,

Most teachers who have been trained agree that if we were to focus on LTF as a district-wide teaching plan, within five to six years we would see a significant positive change in our high school students. But we need leadership that can allow us the time, support, and encouragement to implement that. If you can influence our educational leadership to allow us the time to work on implementing these strategies during our monthly department meetings, that would be very refreshing.

The LTF website was also cited as a challenge (N=12). Respondents said that while the website is full of wonderful content, it is difficult to navigate and needs a better layout. One respondent said,

While there are benefits to organizing lessons by standards, it would be extremely helpful if I could also search lessons by topic. For instance, to be able to search “factoring” and to see any lessons that include factoring would enable me to more easily select lessons that are directly applicable to the content being taught. That way the Pre-AP lessons would fit more seamlessly into my teaching.

Other respondents said that the materials posted on the website were not easy to modify and that having Word files instead of PDFs would be helpful. One respondent said, “I do not want to use every question on the LTF assessment, and the program does not allow me to cut and paste. If cutting and pasting were enabled from the assessments, it would be a great time saver.” Another respondent said, “The other issue is that I would like sample answers to the activities. This would assist me in sharing the LTF with my co-teacher who is not trained, as well as our special educator, who would need answers to modify some of the assignments.”

**Additional support desired from MMSI.** The survey asked respondents to identify types of additional support from MMSI that would be helpful, and 148 provided comments. The most common request was for strategies on scaffolding, how to work with students more effectively (mainly ELL and special needs students), and lessons that are more appropriate for lower-level students (N=43). Comments included:

* I believe more emphasis needs to be made around pedagogical strategies. Where can teachers find these strategies? The training sessions focused on completing activity worksheets, and while this does a great job in helping staff members with content, the delivery was based on completing worksheets. I would like more support in implementing the LTF content in the classroom creatively.
* Create an LTF website section that may have additional support resources for ESL Basic students, SPED-ESL students, and students of SIFE programs who have not attended school in their native countries.
* We haven't talked about scaffolding lessons for a wide variety of students. That would be most helpful, and also models of student writing for the various types of writing found in the LTF books and websites. I'd like to see some anchor papers to guide expectations of my students.
* Information on differentiating and scaffolding to get my kids to where they need to be. Ideas on integrating the grammar lessons so that they add to, rather than distract from, the literary skill work. (They seem to forget their grammar-based skills shortly after the lessons, if we get into another area for a week or so.)

Similar to responses from last year’s survey, additional supports requested were related to resources and materials (N=26). Respondents mentioned that they would like sample lessons that use the same books that their own districts were using, more inquiry-based lessons, manuals for students to cut down on making copies, lab exercises that do not require specific equipment such as graphing calculators, examples of students’ work to use as a frame of reference, and supplies and technology to implement lessons. One response to this question offered the following series of questions, integrated with an implied critique of some LTF worksheets:

[With regard to] answers to worksheets, especially in cases where the answers are up for interpretation: Why does LTF believe that a specific answer is correct? What was the thinking behind the interpretation? What evidence is being used to support the conclusion? (e.g., Edna's Ruthie Q: How does the narrator feel about Ruthie?...is the answer supposed to be loves her or feels friendship? Either can be supported by the text.)

Eighteen teachers asked that the LTF website and the materials online be more user-friendly. Respondents said that they had difficulty searching for lessons online and modifying lessons as PDF files. The following are comments and suggestions from teachers on how the website can be made more useful:

* The search routines and website are difficult to navigate. The lessons are based on AP topics as opposed to core curriculum or traditional math topics. They could be better indexed and written for traditional topics. Because some of them tie so many topics together they can be only used after all the topics have been taught and thus are hard to incorporate. At least in the past they are difficult to modify to meet individual teaching needs. These need to be in an easily modifiable format such as MS Word.
* A centralized list of various topics in the subject matter (by course and/or grade level) under which are listed the LTF lessons that best fit with those topics.
* A dropbox so we can just grab the files instead of downloading them one by one off the website.
* Often it is difficult to find specific lessons online if there is no author. Any way to create a search by category, such as Skills: Mood and Tone, or Grammar: Commas?
* Your website is not user-friendly. I have to scroll through tons of information to find what I am looking for (if I can find it at all), and your search option doesn't find relevant lessons. I would love to be able to search by module or by lesson title and find different readings and levels for the lessons or skills.

Eleven teachers said that they would like more opportunities for group meetings and collaboration. Respondents also asked for more guidance during meetings. One respondent said, “My district needs to allow for collaboration across levels. It is difficult to run these meetings. It would be great to get someone from the outside.” Another said, “Insight and guidance with vertical team meetings. Materials are needed to run the activities. We are so behind as a district; it has limited what we were able to do this year.” One teacher said that she was interested in meeting with other special education teachers in order to brainstorm ideas for scaffolding and designing activities. Related to the above, nine teachers said that MMSI’s help is needed to encourage administrators to be more committed to the Pre-AP initiative, by providing more time for meetings and purchasing more materials and technology. One teacher said, “This may be a request for a miracle, but if MMSI could give a mini-training to our superintendent, principal, and all department heads, maybe they could be influenced to focus on LTF.” Another said, “Lastly, the coordinators and facilitators of these trainings need to come to the schools and sit down with the principals and vice-principal(s) to explain to them, in detail, the importance of this approach and how it will impact students' future encounters with school/college.”

Ten respondents said that they would like LTF trainers to check in or follow up with them throughout the school year. Several respondents suggested periodic email blasts updating them with mini-lessons on different topics; new materials posted on the website; and tips, ideas, and suggestions for lessons. Nine respondents reported that their school had received only limited Pre-AP training, either because training for their subject was not offered at their school, their district does not send them to all three years of training due to inadequate funding, or getting teachers to volunteer to attend training has been a challenge.

Respondents requested additional support in integrating Pre-AP into the Common Core curriculum (N=9). One respondent must prepare students for MCAS and would like know how to incorporate LTF lessons, while another would like to see a document showing how LTF activities can be integrated into the outline of a course. One teacher said,

Connections to the STEM curriculum for ELA teachers would be most helpful. Also, coaching guidelines for co-teaching writing across the different content areas. In other words, what would teaching writing look like for history and science classes, so ELA teachers can help colleagues teach writing that aligns with Common Core standards?

Seven teachers expressed interest in learning more about the LTF assessments, and seven teachers said that it would be helpful to see actual in-person or online video demonstrations of LTF lessons. Some of these teachers said that they would like MMSI to help coach and teach some lessons in their classrooms.

One respondent said,

As we move into the next school year, it would be most helpful if I could observe a couple of model LTF lessons either at my school or online. At this moment I am not that familiar with the MMSI website, so I don't know if there are any videos of actual LTF/MMSI lessons. It would be even better if these lessons incorporate scaffolding strategies for special needs and ELL students.

**Changes to training.** Respondents were asked to suggest changes to the four-day MMSI trainings they have attended, and 94 teachers provided comments. The most common suggestion was to allow more time for planning, collaboration, and designing lessons with other teachers from their district (N=22). One respondent said that they would like to receive assistance in planning during the training. Specifically, this respondent suggested that after doing an experiment, the teachers should have time to modify the lesson to suit their students’ ability levels with the help of the trainer. Another respondent said that planning time during training would provide them with opportunities for real-time feedback from trainers, rather than posting questions online in a forum and then waiting for people to respond. One teacher suggested creating Google documents with fellow colleagues to share ideas. Two comments were:

* It would be beneficial for teachers from the same district to be assigned to the same classroom. It would be helpful for teachers to be grouped by grade level for training on lessons related to the specific curriculum that we teach. A 30-minute/day vertical team meeting among teachers in the same district may be useful for coordination of our efforts.
* On each day in the afternoon, we should be required to make a lesson for our class based on an LTF lesson. I found this the most helpful (but we only had this 2 [times] in the total 8 days), and worked with my colleagues from my school to develop a lesson we could all implement for a grade level. This would also be a good way to build lessons that we could build into our curriculum.

Eighteen respondents provided a variety of comments related to activities, lessons, and content during the training. Some of these comments are provided below.

* Many of the lessons are quite good, but extremely repetitive (more reading selections needed). Also, the questions are leading and allow for little differentiation in students' responses (looking for one "right" answer). Finally, the modules need to be proofread—there are many errors in grammar that detract from the quality of the lessons.
* I would incorporate more hands-on activities that support student's learning.
* I would like to do fewer activities requiring the use of graphing calculators. Plants are not in our Biology curriculum for our non- honors students because we follow the MA Biology standards. Although the plant activities are interesting, we don't have time to do these with our students.
* I would make the four days to be more interactive.
* Inclusion of iPad components.
* Many of the lessons require electronic data collectors/probeware. Those lessons become un-doable at my school because we do not have those materials. In the absence of that technology, show us how to do these activities assuming that we can't borrow the equipment from anywhere. The technology activities would be great to do, if we had the technology. With the budget cuts expected, there is no way a tech purchase of graphing calculators with probeware and training on how to use the probeware will happen, for example.
* More emphasis on stats.
* As a high school teacher, less time trying the lower-level activities and more time with the upper level activities. In addition, a chance to explore and have access to the other types of LTF Literacy and Science for myself so I can see how the activities and ideas are shared across the disciplines.
* Better connection to higher-level thinking and real-life applications.
* Last summer we spent a lot of time on stem and leaf plots. Sixth grade now studies box and whisker plots. I wish we had spent more time on those. Also we have to teach the Absolute Mean Deviation. That concept was not discussed at all.
* Provide the materials needed so that we can be more efficient when accessing them.

Teachers reported that they would like more time spent on differentiating, scaffolding, and designing lessons for students (N=13). Nine teachers asked for changes to the location, dates, and schedule of training. Three teachers said that they wished training was closer to where they live, so that they would not have to drive so far every day. Two teachers said that they preferred spreading the training out over the course of the school year, instead of taking it all during the summer, so that they didn’t have to wait until school started to use the materials. One teacher was unavailable for the scheduled training dates and wanted alternative dates. One teacher asked for the training to be five days rather than four, while another said, “It seems that most of the productive work regarding these lessons happens in the morning, so I would switch the schedule so that we only attended classes in the morning and left after we were instructed how to implement the lessons and tried them once.”

Similar to the challenges and requests for additional support, teachers suggested that the summer training have a better connection to the Common Core or district curriculum (N=9). Two comments are provided below.

* The workshops are good and valuable, but I wish they could be district-specific. Middle school curriculums are varied across the state, and some of the lessons I learn are not part of my curriculum. I don't know how, but if two presenters presented at the same time, allowing the teachers to select which topic fits their needs the best.
* Information on the vision/big picture, how do we implement this and exactly what will it accomplish? The middle school is struggling to meet the CCSS and raise our scores. We are making lots of changes and developing all new benchmark tests, quizzes and learning a new comprehensive curriculum (CMP). How does this fit in?

Nine teachers asked for a trainer who is better prepared to do the training. Some teachers said that they were disappointed that the trainer was reading to them directly out of a book, rather than offering more engaging pedagogy.

Respondents also asked that the training be broken up by grade levels (N=8). One teacher reported that it was challenging to be a 6th-grade teacher who was grouped with 11th- and 12th-grade teachers during the training. Another teacher said, “Most of the lessons are for higher levels of math than grade-six- or grade-seven-appropriate lessons. I would prefer to see more and participate in more grade-level-appropriate lessons, rather than what is appropriate for 8th, 9th, 10th grade lessons.”

Seven teachers suggested changes to the pace of the training. Most of these teachers said that the pace was slow and the materials were repetitive, so it would be better to review materials more quickly, in order to have time to cover more materials, learn more strategies and skills, or do more planning with other trainees. Finally, three respondents asked to focus more on assessments.

**Changes or improvements to the lead teacher training sessions.** Lead teachers were asked to comment on any changes or improvements that they would make to the lead teacher training, and 16 responded. Five suggested changes to the time, location, and schedule of the training. Other suggestions included having a shorter and more focused training day; having a longer training session, considering the amount of information covered; having the training in a more convenient location; adhering to the time and agenda as scheduled; and not forgetting to invite some of the lead teachers. Four lead teachers asked for more direction and guidance on vertical team meetings, such as better ways to run meetings, and learning how other districts are running their meetings. One teacher said,

We were supposed to have four vertical team meetings where administrators, guidance counselors, and special education administrators were all presented pre-AP concepts. Our vertical team meetings are now just a continuation of LTF lesson trainings. This is presenting “overkill” to the math teachers, and we have now evidenced a high rate of absenteeism.

Two respondents said that they would like time to collaborate with lead teachers from other districts, to discuss how their districts are implementing the Pre-AP program. Two lead teachers said that they needed more assistance in getting buy-in from their administration in order to better implement their Pre-AP program. One lead teacher would like more examples of how LTF is at the forefront of preparing for the new assessments.

**Pre-AP Administrator Survey**

The Pre-AP Administrator Survey (Appendix F) was sent to the primary program administrator in all Project 4D districts (N=41). Three of these administrators had opted out of the survey software on previous surveys, so the survey reached 38 administrators, with a response rate of 55% (N=21).

Respondents’ roles included curriculum coordinator (76%, N=16), assistant superintendent (14%, N=3), superintendent (5%, N=1), and central office administrator (5%, N=1). All respondents said that they were district-level administrators. Three respondents also indicated that they were high school (N=2) or middle school (N=1) administrators.

As shown in the next table, 67% of administrators (compared to 68% of respondents to the teacher survey) agreed that teachers in their schools/districts have adequate curricular resources to implement Pre-AP lessons and/or assessments, and 71% of administrators (compared to 53% of teachers) said that teachers had adequate classroom equipment to do the same. Two out of three administrators (compared to one out of three teachers) agreed that teachers have adequate time to prepare new Pre-AP lessons and assessments, and 81% of administrators (compared to 57% of teachers) agreed that teachers could implement Pre-AP activities and still adhere to the district’s pacing guide. All administrators agreed that they fully support the integration of Pre-AP lessons and assessments into the curriculum, compared to 78% of teachers who believed that their administrators fully support that integration.

The greatest difference between administrators (72%) and teachers (35%) was on the item, “students in my school/district have sufficient academic preparation to participate in the Pre-AP lessons and/or assessments that are targeted to their grade level.” (Teachers were asked about “my students” rather than “students in my school/district.”) Finally, 57% of administrators agreed that scheduling vertical team meetings is a challenge in their district.

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| **Pre-AP Resources and Supports** | | | | | | |
| **Survey Item** | **N** | **Strongly Agree**  **(%)** | **Agree**  **(%)** | **Neutral**  **(%)** | **Disagree**  **(%)** | **Strongly Disagree**  **(%)** |
| Teachers in my school/district have adequate curricular resources to implement Pre-AP lessons and/or assessments. | 21 | 24 | 43 | 14 | 19 | 0 |
| Teachers in my school/district have adequate classroom equipment to implement Pre-AP lessons and/or assessments. | 21 | 14 | 57 | 10 | 19 | 0 |
| Teachers in my school/district have adequate planning time to prepare new Pre-AP lessons and/or assessments. | 21 | 10 | 57 | 10 | 19 | 5 |
| Teachers can implement Pre-AP activities and still adhere to the district’s pacing guide. | 21 | 29 | 52 | 19 | 0 | 0 |
| I fully support the integration of Pre-AP lessons and assessments into my school/district’s curriculum. | 21 | 62 | 38 | 0 | 0 | 0 |
| Students in my school/district have sufficient academic preparation to participate in the Pre-AP lessons and/or assessments that are targeted to their grade level. | 21 | 14 | 58 | 14 | 14 | 0 |
| Scheduling Vertical Team meetings is a challenge in my district. | 21 | 19 | 38 | 10 | 19 | 14 |
| *Note*. Response options also included “don’t know,” but no respondents selected that option. | | | | | | |

**Alignment of assessments and standards.** As shown in the table below, 100% of administrators (compared to 86% of teachers) said that the LTF curriculum is well aligned with the Common Core standards, 95% of administrators (compared to 82% of teachers) said that the connections between the LTF curriculum and the Common Core are well specified, and 100% of administrators (compared to 88% of teachers) said that the LTF lessons and assessments are examples of high-quality pedagogical practices.

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| **LTF Curriculum and the Common Core** | | | | | | |
| **Survey Item** | **N** | **Strongly Agree**  **(%)** | **Agree**  **(%)** | **Neutral**  **(%)** | **Disagree**  **(%)** | **Strongly Disagree**  **(%)** |
| The LTF curriculum is well aligned with the Common Core standards. | 21 | 33 | 67 | 0 | 0 | 0 |
| The connections between the LTF curriculum and the Common Core standards are well specified. | 21 | 33 | 62 | 5 | 0 | 0 |
| The LTF lessons and assessments are examples of high-quality pedagogical practices. | 21 | 43 | 57 | 0 | 0 | 0 |
| *Note*. Response options also included “don’t know,” but no respondents selected that option. | | | | | | |

Administrators reported participating in an average of 2.6 Pre-AP vertical team meetings (range 0 to 7). Four administrators reported that they have not participated in any vertical team meetings, and one did not respond to this item. About half of the respondents (43%) said that they had not observed any teachers conducting LTF lessons in their classrooms; the remainder said they had observed 1–2 lessons (29%), 3–5 lessons (14%), or more than 5 lessons (14%).

Fifty-three percent of respondents reported that their school or district had specified a minimum number of LTF lessons and/or assessments that Pre-AP trained teachers are expected to implement during this school year. On average, these administrators reported that they expect Pre-AP trained teachers to implement at least five Pre-AP lessons or assessments during the 2012–13 school year. The remaining respondents reported that their school or district had not specified a minimum number.

Sixty-two percent of administrators (N=13) reported that they had attended MMSI’s Pre-AP administrator training day. As shown in the table below, the reported impacts of the training included increased awareness of the importance of using Pre-AP strategies (92%), assistance in working with teachers to promote Pre-AP instructional practices (61%), promoting the Pre-AP program with district personnel (69%), and assistance with the district’s vertical curriculum alignment efforts (69%). Three out of four respondents also agreed that the training was engaging and well executed.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Pre-AP Training** | | | | | | |
| **Survey Item** | **N** | **Strongly Agree**  **(%)** | **Agree**  **(%)** | **Neutral**  **(%)** | **Disagree**  **(%)** | **Strongly Disagree**  **(%)** |
| 1. As a result of participating in the training, my awareness of the importance of using Pre-AP strategies has increased. | 13 | 31 | 61 | 0 | 8 | 0 |
| 2. What I learned in the training has helped me work with teachers to promote Pre-AP instructional practices. | 13 | 15 | 46 | 31 | 8 | 0 |
| 3. What I learned in the training has helped me promote the Pre-AP program with district-level personnel. | 13 | 8 | 61 | 23 | 8 | 0 |
| 4. What I learned in the training has been helpful with my district’s vertical curriculum alignment efforts. | 13 | 0 | 69 | 23 | 8 | 0 |
| 5. The training session was engaging. | 12 | 17 | 58 | 17 | 8 | 0 |
| 6. The training session was well-executed. | 12 | 17 | 58 | 17 | 8 | 0 |
| *Note*. Response options also included “don’t know.” The percentage of respondents who selected this choice is listed below, but these respondents were not used to calculate the percentages reported in the table. Q1. 0%, Q2. 0%, Q3. 0%, Q4. 0%, Q5. 8%, Q6. 8%. | | | | | | |

As shown in the table below, with regard to requests for technical assistance and support, administrators reported that assistance from MMSI (79%) and ESE (68%) had been helpful and satisfactory. The remainder of responses were “neutral,” and no respondents disagreed or strongly disagreed.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Technical Assistance and Support from MMSI and ESE** | | | | | | |
| **Survey Item** | **N** | **Strongly Agree**  **(%)** | **Agree**  **(%)** | **Neutral**  **(%)** | **Disagree**  **(%)** | **Strongly Disagree**  **(%)** |
| 1. When my school or district has requested technical assistance and support from MMSI for the Pre-AP Teacher Training program, the response has been helpful and satisfactory. | 19 | 42 | 37 | 21 | 0 | 0 |
| 2. When my school or district has requested technical assistance and support from the Department of Elementary and Secondary Education related to RTTT Project 4D: Pre-AP Teacher Training , the response has been helpful and satisfactory. | 19 | 36 | 32 | 32 | 0 | 0 |
| *Note.* Response options also included “don’t know.” The percentage of respondents who selected this choice is listed below, but these respondents were not used to calculate the percentages reported in the table. Q1. 10%, Q2. 10%. | | | | | | |

Administrators were also asked to respond to several open-ended questions, and their responses are summarized below.

**Implementation supports.** Administrators were asked to share the factors and strategies that have been most helpful in implementing their Pre-AP program, and 19 responded. Eight said that vertical team meetings and teacher collaboration had been the most helpful. One administrator said,

Vertical team meetings have been the most helpful. We’ve been able to bring teachers in grades 6 through AP together to discuss content and skills progression as well as to review LTF labs/activities. We've begun to assign specific labs/activities to each grade.

Seven respondents said that Pre-AP training and professional development had been helpful to districts. One respondent said, “Once we had our first round of teachers complete the training, it was easier to market and recruit additional people to participate in the trainings.”

Four respondents reported factors related to their district curriculum. Three said that conversations and a shared commitment around the need to insert more rigor into instruction and curriculum alignment has been most helpful. The fourth mentioned that having a Pre-AP work plan was useful to them. Three administrators said that lead teachers and lead teacher training are both vital to the success of the Pre-AP program. One respondent said,

The lead teacher workshop, especially the workshop held in September of 2012, has helped provide a vision and general structure for creating and maintaining a Pre-AP program at the district level. The lead teacher binder, which was the centerpiece of the lead teacher workshop in Sept. 2012, is an indispensable resource. It meticulously details the roles and responsibilities at the leadership and teacher level. I have found this especially helpful in clarifying the balance of accountability and support as we continue to create an effective, sustainable Pre-AP program.

Administrators also reported that their RTTT grant, which has helped provide stipends for teachers to collaborate and attend vertical team meetings, was a helpful factor in implementing the Pre-AP program (N=2). Another helpful factor reported by administrators was the support provided by MMSI (N=2) and the LTF website (N=1).

**Challenges**. When asked to identify any challenges in implementing the Pre-AP Teacher Training program and the response to those challenges, 19 teachers provided comments. The most common challenge was vertical team meetings (N=6), due to the difficulty of scheduling a time that works for teachers, as well as competing priorities that also require teachers’ attention. Some districts have been able to incorporate vertical team meetings into professional development days, while others plan to make adjustments to next year’s schedules to allow more time for teachers to meet. One administrator said,

Providing time for vertical team meetings with all teachers in grades 5–12 has been extremely challenging, so we have had to do “split” meetings (because the high school and elementary school schedules and release times don't line up) or have meetings with less than full 5–12 participation, which is less than ideal. To address this, we have embedded vertical team time into some of our district-wide PD days, but that has not been enough to solve the problem since we have so few PD days available for that kind of purpose.

One of the greatest challenges for administrators was the need for funding (N=5). Administrators reported that lack of funding has limited their ability to send teachers to training or to purchase materials such as graphing calculators, probeware, and science equipment to support the program. In addition, four administrators reported that their biggest challenge was to understand what Pre-AP is, to increase the level of academic rigor in their district, and to make the Pre-AP program fit into their district curriculum. One administrator reported,

There was a concern regarding what “Pre-AP” was intended to mean. I have worked closely with our lead teacher to assure her that “Pre-AP” is as much about advanced skill development as it is about content acquisition. This has helped to solidify our plan for providing a comprehensive Pre-AP experience to all of our students.

Another respondent reported having struggled to maintain fidelity to LTF’s Pre-AP philosophy and to create and maintain structures that support implementation of the Pre-AP program consistently. This respondent shared that the district has attempted to address this challenge by creating a facilitator position to coordinate the district’s Pre-AP efforts.

Three administrators reported that getting teachers to participate in Pre-AP training has been a challenge. One respondent said,

While the LTF-trained teachers are enthusiastic about implementation, that is still a minority of the teachers in each subject area. “Selling” the other teachers on LTF has been difficult, so the implementation becomes inconsistent. We have tried to offer the training to more teachers, but we haven't been able to get more teachers to show interest in training over the summer.

Changing teacher practice, inconsistency, too many initiatives, and the location of training were also challenges reported by administrators. One respondent explained the challenge of teachers utilizing the LTF website:

I wonder if they are too dependent on the site. I need to have closer monitoring from department chairs, who monitor instruction and lesson plans more closely. I have collected sample lessons from all participants. From some, I received copies of lessons downloaded from the website without evidence of how the lessons fit in with teachers’ curriculum planning. We are currently working on training staff in UDL format, but it is slow.

**Administrator training recommendations**. Administrators were asked to make suggestions to improve the MMSI summer administrator training session, and seven provided comments. One explained that he would like to participate in more training in order to gain a better understanding of the rigor that the program offers. Another said,

More explicit instruction/guidelines about what the implementation should look like, given the realities of district need (i.e., the consistent difficulty with training a handful of people and then expecting the training to expand to all teachers without the resources to provide sufficient collaborative time). Active participation in an LTF lesson. (We observed some things being taught, but learning via an LTF lesson would be powerful, I think.)

Other individual suggestions included providing more time for interaction and networking between districts with similar populations, video demonstrations of exemplary LTF lesson implementation in the classroom, data on the performance of students who are exposed to LTF activities compared to students who lack that exposure, linking LTF to each district’s curriculum, and having the training at a more convenient location.

**MMSI and ESE training and technical assistance**. Respondents were asked to identify what training or technical assistance from MMSI or ESE had been most helpful, and 10 administrators provided comments. Similar to last year, administrators reported that MMSI’s and ESE’s responsiveness in providing support had been most helpful (N=7). Some respondents reported having received assistance in preparing and presenting content material at vertical team meetings, identifying the scope and sequence of lessons for high school courses, and working on grant paperwork. Other assistance cited individually by respondents included the teacher training, the lead teacher training, and refreshers on how to use the LTF website.

**Additional support from MMSI and ESE**. When asked what further training from MMSI and ESE would be helpful, 11 administrators provided comments. Three said that they wanted training for district administrators in order to better support teachers, obtain strategies for effective classroom observation, or provide oversight to ensure fidelity to the Pre-AP program. Three administrators commented on the website, requesting easier navigation to find materials; further development of the forums, so teachers across districts could have more direct and ongoing contact with each other; and access to the website for teachers who completed the training a few years ago. Two administrators asked that models of successful Pre-AP programs be shared, and two asked for more program funding. One administrator said,

MMSI’s teacher training and support for vertical articulation is excellent. However, we are lacking guidance in systemic change to support an effective Pre-AP program. I realize that MMSI is now offering “Engagement managers” for districts, which we desperately need, but at this point cannot afford. The concept of a Pre-AP MMSI trained and experienced staff member embedded in a district to work with administration and teachers is what the doctor ordered. How can the ESE help fund this position for cash-strapped districts beyond RTTT funds?

One administrator asked for better alignment of Edwin to the LTF materials, and another asked for assistance in placing Pre-AP lessons in their curriculum maps. Lastly, one administrator asked how the LTF assessments will help students succeed on the PARCC assessments.

**Advice to others implementing LTF curriculum**. Respondents were asked to provide advice for others who were trying to implement the LTF curriculum in their school or district. Fifteen administrators provided comments, which included carefully selecting teachers and lead teachers who will be “cheerleaders” and collaborate with other teachers in order gain buy-in from “stragglers” (N=3); using LTF materials to discuss increasing rigor in curriculum with teachers and administration (N=2); being aware from the beginning of the time commitment required to implement the program (N=1); and providing teachers with enough time to plan, work with materials, and discuss outcomes (N=1). Some of their specific comments are provided below.

* My advice would be to create a substantial materials/equipment budget so that teachers can implement the lessons, and to create time for teachers to meet as a “professional learning community” where they can plan and debrief on the labs.
* First, I would suggest developing a Web 2.0 structure that will allow for teachers and administrators to interact and collaborate in regard to Pre-AP strategies and practices after initial Pre-AP training and between vertical articulation meetings. For example, creating a Moodle that would allow for teachers to share ideas and receive specific district- or school-level support on a weekly or bi-weekly basis would allow for more effective implementation as they are planning and implementing in real-time. Second, I would encourage the creation of a Pre-AP leadership team that consists of members from MMSI, ESE, and district- and school-level leadership to analyze student assessment data in regard to CCSS standards using district- and school-level assessments. This team would also evaluate where or if current curriculum maps address specific areas of concern in regard to CCSS standards. Lastly, the team, with MMSI taking the lead as the resource experts, would identify LTF resources and lessons that would support and bolster areas of concern in regards to curriculum and CCSS standards.
* Start small and let it grow. Find the power standards that are truly essential and select activities that will really make those ideas solid for students.
* Use it as the basis for curricular realignment/incorporating the Common Core. It's easier to build off of LTF (because it's comprehensive in a lot of areas) than it is to slide LTF activities into an already-established curriculum. It's POSSIBLE to do the latter, but it feels like more of a force fit than it should.
* I would strongly suggest that districts use the LTF curriculum resources as a guide for developing their own curriculum and lessons, rather than expect to use the package in full after the grant expires.
* You really need to plan ahead and make sure everyone is on board. I needed to post the positions to see interested applicants, and then I needed to change the master schedule to ensure that the teachers comprised a vertical team. There are a lot of big picture things to be concerned with.
* Pick one curriculum area and have all teachers trained in that department. We split between two disciplines and sent six from each discipline. It was good, but having all of the same content would have been more powerful, I think.
* Create a work plan with directors (ELA, math, and science) and building administrators to monitor the implementation in classrooms. Make sure that administrators attend vertical team meetings.

**Additional comments**. When asked to share any final comments, six administrators offered the responses below.

* It would be great if other teachers who do not attend the training could have digital access to the materials. It becomes somewhat difficult when only trained teachers can access the materials.
* I think it is important to show teachers how to create the kinds of experiences that the LTF program includes. Rather than having teachers following a road map to a good lesson, I want my teachers to understand the components of a “pre-AP” lesson and be able to create one of their own. This will yield a more sustainable change in the education of our kids.
* It seems like we always get the teachers signing up who don't need to participate. The ones who do need it won't sign on or use it, because it’s too much work.
* If more LTF training were offered in two-day chunks during the school year (say a Thurs/Fri in Nov and again in January), we could get more people trained, because it's easier to cover teachers with subs than it is to have them give up time in the summer or pay them a stipend to attend.
* I regret that I did not set the expectation (from central) for the number of lessons I expected from each teacher. That is something I will consider and surely do.
* The training for the Pre-AP leads is expensive, and we found it not to be especially helpful. Some teachers in this role need more guidance. Some of the monies spent on this one-day training could be spent on training additional teachers.

**Vertical Team Meeting Attendance**

The number of vertical team meetings held by a district is one indicator of Pre-AP implementation. In both years of program implementation (i.e., Years 2 and 3), UMDI has emailed the lead teachers and district administrators of Project 4D districts multiple times, each time sending an attendance form and requesting that the district representatives submit logs of all Pre-AP-trained and other personnel who have attended vertical team meetings.

The table below shows the number of vertical team meetings for which attendance logs have been submitted by each Project 4D district. Cohort 1 districts are presented first and should have held vertical team meetings in both Years 2 and 3, whereas most Cohort 2 districts should have held vertical team meetings only in Year 3. One exception is Chicopee, which completed LTF Part 1 training in January of 2012 and began full implementation during Year 2. The remaining Cohort 2 districts that submitted vertical team meeting logs for Year 2 (i.e., Saugus and Somerset) were originally considered Cohort 1 districts; UMDI does not currently know why the cohort designation of these two districts was changed.

Year 3 data are still being actively collected and therefore will change, so the following brief summary of the table is based only on the Year 2, Cohort 1 data. As shown in the table, 12 out of 17 districts (71%) submitted attendance data for at least one discipline, and 23 out of 34 district disciplinary teams (68%) submitted attendance data. Of these 23 teams, 30% (N=7) submitted data for two meetings, 22% (N=5) for three meetings, and 48% (N=11) for four meetings.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Vertical Team Meeting Attendance Logs Submitted, by Cohort, District, and Discipline** | | | | |
| **Cohort** | **District** | **Discipline** | **Logs Submitted, Year 2** | **Logs Submitted, Year 3** |
| 1 | Attleboro | ELA | 4 | 4 |
| 1 | Auburn | ELA | 4 | 4 |
| Math | 0 | 4 |
| 1 | Boston | Math | 4 | 3 |
| Science | 3 | 0 |
| 1 | Chelsea | ELA | 2 | 2 |
| Math | 2 | 0 |
| Science | 2 | 0 |
| 1 | Easthampton | ELA | 0 | 2 |
| Math | 0 | 2 |
| 1 | Everett | ELA | 4 | 4 |
| Math | 4 | 4 |
| 1 | Fall River | ELA | 4 | 3 |
| 1 | Malden | ELA | 3 | 2 |
| Science | 4 | 3 |
| 1 | North Adams | ELA | 2 | 4 |
| Math | 2 | 4 |
| Science | 2 | 4 |
| 1 | Pittsfield | ELA | 0 | 3 |
| 1 | Salem | ELA | 0 | 4 |
| 1 | Southwick-Tolland | ELA | 0 | 4 |
| Math | 0 | 4 |
| 1 | Swampscott | ELA | 3 | 4 |
| Math | 4 | 0 |
| 1 | Uxbridge | Science | 4 | 2 |
| 1 | Waltham | ELA | 3 | 4 |
| Math | 4 | 4 |
| Science | 4 | 4 |
| 1 | West Springfield | ELA | 3 | 4 |
| Math | 2 | 4 |
| 2 | Central Berkshire | ELA | 0 | 2 |
| Math | 0 | 2 |
| 2 | Chicopee | Math | 4 | 4 |
| 2 | Falmouth | ELA | 0 | 3 |
| Math | 0 | 4 |
| Science | 0 | 4 |
| 2 | Holyoke | ELA | 0 | 4 |
| 2 | Marlborough | ELA | 0 | 4 |
| Math | 0 | 4 |
| Science | 0 | 4 |
| 2 | New Bedford | ELA | 0 | 3 |
| Math | 0 | 4 |
| Science | 0 | 4 |
| 2 | North Brookfield | Math | 0 | 4 |
| 2 | Sabis International Charter | ELA | 0 | 4 |
| 2 | Saugus | ELA | 0 | 3 |
| Math | 4 | 4 |
| Science | 0 | 3 |
| 2 | Somerset | Math | 4 | 4 |
| 2 | Whitman-Hanson | ELA | 0 | 4 |
| Math | 0 | 4 |
| Science | 0 | 4 |
| 2 | Whittier Reg. Voc. Tech. | ELA | 0 | 4 |
| Math | 0 | 4 |
| Science | 0 | 4 |
| 2 | Winchendon | Math | 0 | 4 |
| Science | 0 | 4 |
| 2 | Worcester | Science | 0 | 3 |

Some Project 4D districts are not shown in the table for the following reasons:

* City on a Hill Charter, Fairhaven, and Northampton: MMSI asked UMDI not to request attendance logs from these districts until further notice, and have informed UMDI that these districts have not responded to MMSI’s inquiries regarding vertical team meetings.
* Danvers, Southbridge: Have not responded to multiple UMDI emails.
* Ashland: Paying through district rather than RTTT funds.
* Berkshire Hills: Very limited program due to budget constraints.
* Boston Preparatory Charter: MMSI said that they did not send anyone to training, so it was safe to assume that they were not holding vertical meetings.
* Framingham: Lead teachers emailed UMDI in February 2013 saying that they would send attendance information once they start holding vertical team meetings. UMDI sent reminders in April and June but have not received a response.
* Leominster: MMSI said that they are not holding vertical team meetings.
* Wareham: Only participated in Project 4D during Year 2, and were a special case because they were finishing training for teachers who had already been trained in math parts 1 and 2.

**Conclusions and Strategic Considerations**

* **Initial findings show patterns of AP course and exam taking and success that are consistent with positive Pre-AP program impacts, but plausible alternative explanations need to be ruled out.** These patterns include more positive student indicators in Pre-AP districts than in the state as a whole, as well as more positive student indicators in Cohort 1 districts than in Cohort 2 districts. However, UMDI’s recent integration of AP program districts into the Pre-AP analysis showed that many Pre-AP districts are implementing both programs, which will complicate the attribution of changes in AP course and exam participation and success to one program or the other. UMDI’s annual evaluation plans have acknowledged the difficulty of assessing the impacts of individual dropout prevention and college and career readiness programs in an environment where many such interventions are being offered simultaneously and with limited ability to assess extent of implementation. During the 2013–14 school year, which is the final year of the current evaluation, UMDI will be proposing a substantial focus on developing and conducting quantitative analyses that provide the strongest answers to these questions that the available data and evaluation resources can make possible.
* **Initial findings that may support positive program impacts on AP course and exam participation and performance suggest stronger impacts for math and science than for ELA.** The report presents ratios of non-high-needs (NHN) students to high-needs (HN) students with regard to several indicators of AP course and exam participation and performance, and compares those ratios across multiple district groupings and the state as a whole. (A ratio greater than one indicates higher rates of participation and success for NHN than for HN students.) For math and science, these ratios for the whole state are substantially higher than for districts that are Pre-AP Cohort 1 or Pre-AP and AP, but a similar improvement is not observed for ELA.
* **The gaps between NHN and HN students on AP course and exam participation and performance are very large, but the gaps on AP exam performance are by far the largest.** Of the four gaps addressed in the report – (1) AP course participation, (2) AP course performance, (3) AP exam participation, and (4) AP exam performance – the ratio of NHN to HN students statewide is in the 3–4 range for the first three gaps, but in the 6–7 range for AP exam performance.
* **Some indicators of Pre-AP program implementation have increased.** Teacher survey respondents from Project 4D districts reported accessing online materials from the LTF website twice as often in the Year 3 survey as in the Year 2 survey (10.5 versus 5.5 times). In addition, when asked how many LTF lessons and assessments their district expected them to implement during the 2012–13 school year, teacher survey respondents reported more than double the number in Year 3 than in Year 2 (6.0 versus 2.4 lessons and assessments). However, only half of administrator survey respondents said that their school or district had specified a minimum number of LTF lessons and/or assessments that Pre-AP trained teachers were expected to implement during the 2012–13 school year.
* **Despite substantial concerns about students’ academic preparedness, most teachers believe that the Pre-AP program will be effective.** Only 35% of teachers (compared to 72% of administrators) agreed that their students have sufficient academic preparation to participate in the Pre-AP lessons and/or assessments that are targeted to their grade level. Nonetheless, most teachers agreed that the Pre-AP program will be effective in improving students' preparedness for success in AP-level coursework (83%) and college coursework (83%). In addition, the majority of teachers (62%) agreed that implementing LTF lessons brings greater relevance to their classrooms.
* **Teachers in some districts may be receiving conflicting messages about the extent to which they should implement Pre-AP lessons and/or assessments.** While 78% of teachers agreed that they had full administrative support to integrate Pre-AP lessons into their teaching, only 57% of teachers (compared to 81% of administrators) agreed that they could implement Pre-AP activities and still adhere to the district’s pacing guide. For the substantial number of teachers who apparently perceive a conflict between their administrator’s support and the dictates of their district’s pacing guide, maximizing Pre-AP implementation may require (a) changes to the pacing guide, or (b) explicit administrative messages regarding what aspects of the pacing guide teachers should disregard in favor of implementing Pre-AP lessons.
* **Impacts of the Pre-AP program might be strengthened by providing some teachers with additional resources.** Many teachers agreed that they had adequate curricular resources, adequate classroom equipment and supplies, and long enough class periods to implement Pre-AP lessons and/or assessments, but nearly half did not agree. Moreover, just one third of teachers reported that they had adequate planning time to prepare Pre-AP lessons and/or assessments, and that they had sufficient time to share Pre-AP approaches with same-discipline colleagues. While it might not be feasible financially for some schools or districts to provide teachers with additional resources, it is important to recognize that the Pre-AP program’s potential impacts might be reduced by the resources available in some schools and districts.

# STEM-focused Early College High Schools

## Methods

This report includes information collected from the following data sources:

* *Interviews with STEM ECHS administrators and IHE partners*.
  + Interviews (60–90 minutes) were conducted with administrators from the six Goal 4E sites in March and April 2013 (see interview protocol in Appendix G).
  + Phone interviews (60 minutes) were conducted with representatives from IHE partners in April and May 2013 (see interview protocol in Appendix H). UMDI was unable to schedule an interview with one IHE partner because the primary contact person didn’t respond to multiple inquiries, and UMDI found out in June that there was a new contact person. UMDI will continue attempting to schedule an interview during July and August 2013.
* *Personnel Survey.* An online survey was sent in March 2013 to all STEM ECHS personnel identified by STEM ECHS administrators (see interview protocol in Appendix I).
* *Observation.* UMDI attended the Future Ready Summit on May 20, 2013. This event also functioned as a full-day STEM ECHS technical assistance meeting.

**Findings**

**Successes**

During interviews, STEM ECHS program administrators described the following successes:

**The STEM ECHS sites are operational**. All five implementing sites reported that STEM ECHS courses and activities were running smoothly. Several sites noted that they made changes to their original plans in order to accommodate challenges such as logistics and personnel matters, as described in the challenges section below.

**STEM ECHS students are engaging with STEM content and are confident in their abilities.** Interviewees at all implementing sites reported that STEM ECHS students were more engaged and confident, on average, than non-STEM ECHS students, and that most STEM ECHS students were meeting or exceeding expectations for academic development and performance. Several administrators noted that their STEM ECHS students were more interested in attending college because of their experience in the STEM ECHS. Across all implementing sites, administrators reported that expectations for rigor in the STEM ECHS are higher than in the district at large, and that STEM ECHS students’ study skills and habits have improved to meet those expectations. One interviewee said, “Some students involved in this program would never have taken an honors-level course load [if they weren’t enrolled in the STEM ECHS]. These students have been surprised at their own abilities. They are rising to the necessary level, with a lot of support.” Another interviewee said, “Students are developing and adapting to this experience. The students are young, and still have a lot of high school experiences left to have, let alone participating in a college course. It has been an emotional growth, and an intellectual growth.”

**College experiences for students.** Students at four implementing sites have enrolled in one or more credit-bearing, college-level courses. The fifth implementing site plans to enroll its first cohort of STEM students in a college course in the fall of 2014. Administrators at all sites reported a preference for students taking college courses at college campuses, but some sites stated that logistical and budgetary constraints made it more feasible to locate college courses at the high school building. Even when attending courses on college campuses has not been feasible, administrators agreed that participation in college courses has been a very important part of students’ STEM ECHS experience. One interviewee said, “The general mindset of what college is all about is coming across to the students.”

**Strong support from school and district leaders.** All STEM ECHS administrators said that they have received strong support from district-level administrators, and that the program was well received by district leadership and staff. One interviewee said, “The level of receptivity has been fabulous. People have committed time and resources.” Interviewees stated that continued support and commitment from district leadership was critical to the continued success of the STEM ECHS. Two interviewees noted that their district’s grants office has been instrumental in supporting the work of the STEM ECHS. Several interviewees said that they have received significant support from their guidance departments in identifying, recruiting, and supporting STEM ECHS students. Several sites also reported that they have received support from their district to promote the STEM ECHS to students, parents, community members, and the business community.

**Communication.** Four districts reported that the quality, frequency, and clarity of communication within their district (e.g., within individual school buildings, between buildings, and with district administrators) regarding the STEM ECHS had improved. Two districts reported some communication challenges; these challenges were generally related to turnover in key leadership or staff positions.

**Partnerships between districts and IHEs are becoming clearer and stronger.** All sites indicated that their relationship with their IHE partner(s) has become clearer, and that their IHE partner had been positive and supportive. One interviewee noted, “We have started to figure out each other’s expectations. There is more trust. … [We] did not initially understand [our IHE partner’s] expectations or level of flexibility.” Three sites stated that they are actively engaging with their IHE partner(s) to identify effective strategies for providing STEM ECHS students with access to college-level coursework, and that these discussions were generally positive and productive. Similarly, all IHE partners indicated that their partnership with the STEM ECHS was moving in a positive direction. It should be noted that plans for service and course delivery have shifted at several sites (e.g., on-campus classes have been shifted to high schools, placement exam requirements have been refined, and college course sequences have been amended).

**STEM ECHS sites and their IHE partners are planning for sustainability.** All STEM ECHS sites have clearly identified sustainability as an ongoing challenge, and are considering a wide array of strategies for addressing this concern. Several sites are in the process of exploring additional grant opportunities and developing relationships with local or regional industry leaders. One site obtained 501(c)3 status so that they could accept outside donations. One site has created an engineering lab to accommodate STEM ECHS activities, and another site is remodeling classroom space to accommodate the anticipated expansion of their STEM ECHS courses and activities. STEM ECHS leaders at each site are engaging in discussions with their district leadership regarding strategies for sustaining (and in some cases expanding) STEM ECHS offerings.

All sites with students enrolled in college courses are working closely with their IHE partner(s) to maximize the likelihood that the program will be sustained over time. One IHE partner is working to institutionalize the administrative and personnel structures needed to support the STEM ECHS. This site views their STEM ECHS partnership as an opportunity to have a lasting impact on the local school system and community. A representative from this IHE said, “We are trying to shape the program to serve as a cultural change agent, a systematic change agent, rather than just being a dual-enrollment opportunity for a small number of students.”

One IHE partner reduced the teaching load of a tenured faculty member and assigned him to manage the relationship between the college and the high school. This liaison has had frequent contact with the administration and staff at the STEM ECHS and at the college. The IHE partner viewed this position as critical to sustaining a working relationship with the STEM ECHS.

**Challenges**

STEM ECHS program administrators also reported the following challenges:

**Sustainability.**All interviewees indicated that finding the financial resources to sustain the STEM ECHS programs is an ongoing challenge and their primary concern. Several interviewees stressed that operational expenses for their STEM ECHS present a significant hurdle to implementation, because costs associated with staff development, curriculum development, planning time, supplies, and college course tuition and travel all exceed average per pupil expenditures for their districts. Several interviewees also said that it would be extremely difficult for their STEM ECHS to offer college experiences for students without outside financial support, so it might be necessary to eliminate or substantially reduce college course offerings after the RTTT grant expired. Two sites said that students might need to pay to participate in college courses in the future. One interviewee said, “Moving forward, we may need to offer only a minimal college experience for students in order to stay within the budget.”

Several interviewees expressed disappointment that the state had no apparent plans to continue funding the STEM ECHS sites after the RTTT grant period. One interviewee said, “[We] still hope the state will offer more funds for this program as it continues to grow. [We] think the state should have some flexibility to invest in an opportunity when it sees potential in a program.” Two interviewees expressed frustration regarding the limited potential for supporting STEM ECHS students’ participation in college courses. Several interviewees indicated that members of their planning and leadership committees were acutely aware of anticipated budgetary deficits. One interviewee said, “We are making plans, but some of that is just hopeful thinking, because the funds for these college courses have not been secured.”

Several interviewees also expressed a desire to expand their STEM ECHS programs (e.g., serving more students, offering greater access to college courses), and noted that budgetary constraints were preventing them from doing so. One interviewee said, “For scalability purposes, additional funds would be required. This may require discussions between the board of higher education and ESE to determine how to make these programs sustainable. We all need to be working to identify ways to make the program as efficient as possible.”

Most interviewees indicated that they were making efforts to reach out to local and regional businesses for support, and all reported that this was a difficult task. One interviewee said, “The fact that this is for kids, companies are willing to help. But when it comes to supplementing with monetary donations, companies are very hesitant with what they do with their money, for natural reasons.”

All IHE partners recognized sustainability as a challenge, and reported that they were working with their partnering district to address this issue. One IHE representative said, “In the end [this college] is the provider. We can’t be the lead voice about the need. … The program may not be as robust as we would like if the funding is not there.”

**Logistics.**Each implementing site reported logistical challenges that included course location, scheduling, and timing; different numbers of students across cohorts; transportation; staffing; and assessments. One interviewee said, “We are still figuring out what to do with the students on the days that they are not taking the college course. We are still thinking about how GPA will be handled.” Administrators at each implementing site said that their leadership teams were working closely to address these logistical concerns, many of which had been difficult to anticipate.

**Continuity.**Each STEM ECHS site has experienced or is currently experiencing one or more significant transitions in district, school, program, and/or IHE partner leadership. Two districts reported difficulty maintaining the continuity of their planning team. Two districts reported that a change in school leadership had caused significant change to the planning team, which disrupted work that was in progress. One interviewee said,

The strong group that was on the leadership team last year, representing diverse interests, does not exist anymore. For many different reasons, people were not able to come back to the steering committee. Some people were overcommitted. … So there is now a deficit—the program’s think tank has been depleted.

Another interviewee said that his district had shifted the staffing model of their STEM ECHS, and this shift caused credibility issues for him with some teachers, who viewed his support of the program as inconsistent. One interviewee said that he felt like their STEM ECHS had “lost a year” because of the turnover in staffing that had occurred within their STEM ECHS leadership team. Another interviewee said, “There has been significant and regular turnover related to the project at [our IHE partner]. Turnover at an administrative level. … [There is] some lack of clarity around how this program fits into [our IHE partner’s] administrative model.”

One IHE partner said that it has been somewhat difficult to work with the STEM ECHS because there has been continual turnover in district, school, and program personnel. Another IHE partner said that it has been difficult managing the personnel transitions within their own institution. This interviewee said, “We need to get better at transitioning from one person to another. … It doesn’t impact the program as a whole, but does impact how smoothly the internal operations of the program may run.”

**Limited staffing capacity.**Two sites reported that a lack of staffing capacity had been a challenge. Administrators from these sites reported that it had been difficult to engage individuals within their district for support because everyone was already working at capacity. Both sites expressed a desire to run their STEM ECHS as a program largely independent from the regular day school in which the program was based (e.g., separate staff, unique curriculum, etc.). However, these individuals noted that the size of the program, and the relatively small size of the student population from which participants were selected, prohibited that program structure. One interviewee said, “Our school is small, so it is not possible to create a team of STEM ECHS teachers… We don’t have the capacity to offer all courses necessary [for the STEM ECHS pathway that had been designed].” An interviewee at one of these sites said that the initial perception that the school would be able to grow staffing capacity to meet the needs of the program has proven to be false.

**Need for planning.**Several sites reported that they were still in the process of planning key program components for the 2013–14 school year. Two sites said that there may be significant shifts in their college course offerings, and that they were holding planning discussions with IHE partners. One interviewee said, “We are currently working on a plan, and the pathways are not fully developed.” Another interviewee said, “We need to make sure that we use all of our resources and time to develop a well-thought-out educational plan and curriculum, and all of the supporting pieces that go with it—including extracurricular activities, externships/internships, the early college piece, parental engagement.” Another interviewee said, “There is no firm agreement between our district and our IHE partner around [our plans].” A final interviewee commented, “Our district is still considering possible pathways for students. We are considering having students get themselves to the university, and have the students enroll in whatever [STEM] courses make the most sense for them. [Our district] is still not sure how the college requirements will be integrated into the school day. We are building, flying, and fueling the plane at the same time.”

**Placement exams (Accuplacer).** Three sites noted that they have had some difficulty with students taking or passing college placement exams. Two sites noted that, in retrospect, it would have been a good idea to have STEM ECHS students complete placement exams as early as possible. Some sites have discovered that students are passing the required placement exams more quickly or slowly than the sites had expected. At one site, more students passed the placement exam than program administrators had anticipated (causing a potential budgetary shortfall), and at two sites fewer students had passed the placement exams than had been expected (making them ineligible to participate in a particular college course). One interviewee said, “We have learned a lot about missed opportunities. Some students may not have taken the placement exams as seriously as they could have. … Some students also learned hard lessons.”

**Making connections between middle schools and high schools.** Three sites are attempting to integrate middle and high school learning experiences into a comprehensive STEM ECHS experience, and a fourth site is considering this option. However, none of these sites has clearly articulated a plan for bridging the two levels. One district reported that there has been no significant contact between the middle and high schools related to the STEM ECHS project. A similar issue was raised last year by a site that has subsequently increased collaboration across the middle and high schools. An interviewee from this site said, “There is still a clear difference between the middle school and high school approach to the STEM ECHS.” An interviewee from a different district said that communication between the STEM ECHS and the middle school had improved, but that team building and planning were part of an ongoing process that still needed additional development. One interviewee said, “Articulation [of curriculum] between the middle school and high school is an ongoing challenge.”

**Formalizing agreements with IHE partners.**All districts are working with their IHE partner(s) to formalize or finalize plans for integrating college courses into students’ STEM ECHS experiences. Several sites reported significant shifts in the content or structure of students’ college experiences. One STEM ECHS administrator at a site where students are currently enrolled in college courses said that their district was still working to finalize an MOU with their IHE partner. This interviewee said, “The MOU is not controlled in the building. That is controlled at the district level. The lack of an MOU has not slowed the work, but has been brought up a few times.”

**Levels of student preparedness.** One implementing site and one IHE partner indicated that they have had some difficulty with students being underprepared, and both indicated that this issue was, in part, the result of inadequate planning for the transition from middle school to high school or from high school to college. One IHE partner said, “Students have real transition issues. Large numbers of students starting the ninth grade are below grade level, and that carries through their high school and college careers. … It was difficult to get students to understand the expectations for college courses. It was a hard sell to get students to understand that they needed to invest a significant amount of time outside of class in order to be successful.”

**Diversity.** Half of the STEM ECHS sites place an explicit focus on recruiting and selecting students from under-represented, high-need, or at-risk populations. Three sites said that their STEM ECHS application process was ‘blind’—accepting students based solely on merit, attendance, or discipline records. The degree to which the other three sites included students’ status as under-represented, high-need, or at-risk as a factor in the recruitment and selection process varied considerably.

**Deepening and Change**

Several administrators reported that their STEM ECHS has become more embedded in the school and/or district culture. Administrators at several sites said that adjustments to their STEM ECHS leadership and/or planning teams had facilitated greater connections within their building, district, or community. One interviewee said, “The team has been expanded and is different than it was last year. [The] team now includes representatives from all departments, guidance, and the middle school. Having that vertical alignment has been helpful, because we are hoping to change some of the course pathways.”

Each implementing site has made changes to its STEM ECHS in order to foster support for the program, and to accommodate contextual demands. As described throughout this report, these changes have included the staffing model, scheduling, cohort size, resource allocation, college course taking plans, content focus, strategy for engaging middle schools, and location of college courses.

STEM administrators noted that that their planning and leadership teams are in a continual process of reviewing and adjusting program content, scope, policies, and procedures. Many implementing sites noted that the planning they carried out prior to launching their program was helpful, and they wish that they had had more time to prepare and organize before accepting students.

**Next Steps**

STEM ECHS program administrators provided a brief overview of their intended next steps, as summarized below:

* ***Sustainability.*** All interviewees indicated that a key next step for their STEM ECHS is planning for sustainability and pursuing appropriate funding opportunities.
* ***Professional Development.*** Four sites indicated that they intend to provide key faculty and staff with professional development opportunities relevant to the needs of their STEM ECHS. Topics of intended PD vary, and include increasing student engagement in STEM, strategies for enhancing curriculum through technology, and teaching college courses.
* ***Planning college experiences.*** Interviewees from three sites said that they were in discussions with their IHE partner(s) to plan students’ college experiences. Several sites are working with their IHE partner(s) to make substantial changes to their original plans.
* ***Curriculum development.*** Administrators from five sites said that they were actively developing plans for course sequences. Four sites said that they had not made as much progress with instructional design and curriculum development as they had hoped. Only one site reported having a clearly articulated course sequence. A few sites reported that their plans and supports continue to be developed as the program progresses, with their goal being to stay “one step ahead” of the students.
* ***Identifying additional IHE partners.*** Three sites said that they were interested in identifying additional IHE partners. One site that is currently partnered with a four-year institution was interested in exploring a partnership opportunity with a community college, and two sites that are currently partnered with community colleges were interested in exploring partnership opportunities with four-year colleges. In all such cases, STEM ECHS personnel stressed the importance of maximizing opportunities for students to participate in positive and meaningful college experiences as high school students, and they considered diversifying their IHE partners as one potential avenue for ensuring that there were good matches available for the needs of all students.

**Best Practices**

STEM ECHS administrators and IHE partners were asked to provide advice on potential best practices. Their feedback is summarized below.

* ***Develop a cohesive STEM ECHS cohort of students and teachers.*** Devise a schedule with a clear cohort of teachers that can work together and share the same cohort of students. Creating a true cohort pathway where the STEM ECHS cohort can stay together for a number of classes has numerous benefits. It is particularly helpful to have all STEM ECHS freshmen take all classes together.
* ***Recruit students as early as possible.*** It is more challenging to recruit 11th- and 12th-grade students than it is to recruit 8th- and 9th-grade students. Similarly, recruiting students in January or February (for participation during the subsequent school year) is easier than recruiting students in April or May.
* ***Provide students with opportunities to take college placement exams as soon as possible.*** Having students take placement exams as freshmen or sophomores is a good idea. Similarly, having students complete placement exams in January or February, rather than April or May, is a good idea. This provides programs, IHE partners, and students more time to plan. It also provides students with a ‘reality check’ about their levels of academic preparedness.
* ***Increase levels of rigor over time.*** Not all students will be as prepared as one might hope, and it is important to provide struggling students with the necessary academic supports. It is also beneficial to establish a culture and expectation of high levels of rigor, and to give students time to acclimate to this shift in mindset. A reasonable strategy is to slowly increase requirements, and slowly withdraw supports. Ideally, this will help establish an environment in which students can become competent and comfortable in working with rigorous expectations.
* ***Identify appropriate strategies for funding STEM ECHS materials and activities.*** Establish clear criteria for separating STEM ECHS expenses from other expenses, which can be challenging. In most cases, STEM ECHS sites have found that curricular materials should be purchased with the instructional budget for the department that will be using those materials, rather than with the program budget. However, other items should clearly be funded by the STEM ECHS (e.g., field trips, laptops).

**STEM ECHS Personnel Survey Results**

The STEM ECHS Personnel Survey was completed by 46% (31 out of 67) of possible respondents, so results may not be representative of all personnel and should be generalized with caution. To identify potential survey respondents, the primary contact at each STEM ECHS site was asked to provide a list of STEM ECHS personnel to take the survey. Consequently, the number of people invited to complete the survey at each district varied. Dearborn Middle School was not asked to participate in the survey (or to submit a list of STEM ECHS personnel), because their STEM ECHS has not begun operation yet. Two respondents did not answer any questions, and were excluded from all analyses. The number of actual survey respondents varied by site, with representatives from Marlborough accounting for approximately half of all respondents. However, at least two people from each site responded to the survey, and survey responses were generally consistent with information gained from interviews at each site. Response patterns were also similar across sites, so UMDI did not weight the data to account for differences in the number of responses per site.

The findings from the STEM ECHS Personnel Survey indicate that:

* Most survey respondents believe that their district has a plan for and is committed to developing and supporting the STEM ECHS.
* Most survey respondents believe that STEM ECHS teachers and students have access to necessary resources and supports.
* Most survey respondents have found the technical assistance provided by JFF and ESE to be helpful.
* Half of all survey respondents believe that their district will not have sufficient funds to support their STEM ECHS after the RTTT funding period is over.

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| **Number of Survey Recipients and Response Rate by Site** | | |
| **STEM ECHS Site** | **# of Survey Recipients** | **Response Rate (%)** |
| Boston Public Schools (Dearborn Middle School) | 0 | NA |
| Massachusetts Association of Vocational Administrators | 9 | 44 |
| Marlborough Public Schools | 37 | 46 |
| Quaboag Public Schools | 8 | 75 |
| Randolph Public Schools | 3 | 66 |
| Worcester Public Schools (North High School) | 10 | 20 |
| **Overall** | **67** | **46** |

Survey respondents were asked to identify their primary role in the STEM ECHS. Nearly all respondents were administrators or teachers. A small number of guidance counselors also responded to the survey.

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| **Survey Respondents by Primary Role in the STEM ECHS** | | |
| **Survey Item** | **N** | **(%)** |
| District Administrator | 5 | 17 |
| School Administrator | 8 | 28 |
| General Education Teacher | 13 | 45 |
| Guidance Counselor | 3 | 10 |

Survey respondents were asked to identify the grade level(s) associated with their primary role in the STEM ECHS. A majority of survey respondents indicated that they work primarily with high school students.

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| **Survey Respondents Primary Grade Assignments** | | |
| **Survey Item** | **N** | **(%)** |
| 6th Grade | 6 | 21 |
| 7th Grade | 4 | 14 |
| 8th Grade | 3 | 10 |
| 9th Grade | 13 | 45 |
| 10th Grade | 15 | 52 |
| 11th Grade | 10 | 34 |
| 12th Grade | 11 | 38 |
| Note: Respondents could select more than one grade level. | | |

A majority of STEM ECHS personnel agreed or strongly agreed that their district has a clear commitment to developing and supporting their STEM ECHS, and that STEM ECHS teachers have access to the resources needed to implement the STEM ECHS curriculum effectively.

Half of all survey respondents disagreed or strongly disagreed that their district will have adequate funds to pay for planned STEM ECHS program activities after the RTTT funding period is over.

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| **District Support** | | | | | | |
| **Survey Item** | **N** | **Strongly Agree**  **(%)** | **Agree**  **(%)** | **Neutral**  **(%)** | **Disagree**  **(%)** | **Strongly Disagree**  **(%)** |
| My district has a clear commitment to developing and supporting the STEM ECHS. | 29 | 24 | 48 | 14 | 14 | 0 |
| My district has a clear plan for developing and supporting the STEM ECHS. | 29 | 14 | 48 | 24 | 10 | 3 |
| STEM ECHS teachers have access to the resources (e.g., technology, curriculum materials) needed to implement the STEM ECHS curriculum effectively. | 29 | 14 | 69 | 17 | 0 | 0 |
| STEM ECHS teachers have the expertise needed to implement the STEM ECHS curriculum effectively. | 29 | 24 | 59 | 17 | 0 | 0 |
| The STEM ECHS program administrators in my district have provided adequate support and guidance for STEM ECHS activities. | 29 | 28 | 38 | 28 | 3 | 3 |
| The district will have adequate funds to pay for planned STEM ECHS program expenses (e.g., personnel, training, and student college tuition) after the RTTT funding period is over. | 20 | 0 | 10 | 40 | 40 | 10 |
| Note: Response options for Q6 also included “Don’t Know.” The percentage of respondents who selected this choices is listed below, but those respondents were not used to calculate the percentages reported in the table. Q6. 31%. | | | | | | |

Most survey respondents agreed or strongly agreed that students in their district have a strong interest in participating in the STEM ECHS. A majority of respondents agreed or strongly agreed that students have access to adequate academic and socio-emotional supports to succeed in their STEM ECHS courses. About two thirds of respondents agreed or strongly agreed that students’ level of academic readiness is a challenge to achieving the academic rigor planned for STEM ECHS courses and activities.

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| **STEM ECHS Students** | | | | | | |
| **Survey Item** | **N** | **Strongly Agree**  **(%)** | **Agree**  **(%)** | **Neutral**  **(%)** | **Disagree**  **(%)** | **Strongly Disagree**  **(%)** |
| Students in my district have a strong interest in participating in the STEM ECHS. | 28 | 18 | 64 | 11 | 7 | 0 |
| Students have access to adequate academic supports to succeed in their STEM ECHS courses. | 29 | 31 | 38 | 21 | 7 | 3 |
| Students have access to adequate socio-emotional supports to succeed in their STEM ECHS courses. | 28 | 29 | 39 | 25 | 7 | 0 |
| Students’ level of academic readiness is a challenge to achieving the academic rigor planned for STEM ECHS courses and activities. | 29 | 17 | 52 | 21 | 10 | 0 |
| Note: Response options for Q1 and Q3 also included “Don’t Know.” The percentages of respondents who selected those choices are listed below, but those respondents were not used to calculate the percentages reported in the table. Q1. 3%, Q3. 3%. | | | | | | |

The reported quality of communication between STEM ECHS personnel and school/district personnel varied considerably. The level and quality of communication between STEM ECHS personnel and parents/community members, IHE partners, and JFF, was generally considered a strength of the program. The level and quality of communication between STEM ECHS personnel and school/district personnel was more mixed, with about half seeing it as a strength and a third seeing it as a challenge.

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| **Strengths and Challenges** | | | | | | |
| **Survey Item** | **N** | **Major Strength**  **(%)** | **Strength**  **(%)** | **Neutral**  **(%)** | **Challenge**  **(%)** | **Major Challenge**  **(%)** |
| Level and quality of communication between STEM ECHS personnel and school/district personnel. | 28 | 18 | 36 | 14 | 14 | 18 |
| Level and quality of communication between STEM ECHS personnel and parents/community members. | 29 | 7 | 45 | 31 | 17 | 0 |
| Level and quality of communication between STEM ECHS personnel and partnering institution(s) of higher education. | 25 | 24 | 36 | 32 | 8 | 0 |
| Level and quality of communication between STEM ECHS personnel and Jobs for the Future. | 18 | 22 | 28 | 33 | 17 | 0 |
| Note: Response options for Q1, Q3, and Q4 also included “Don’t Know.” The percentages of respondents who selected those choices are listed below, but those respondents were not used to calculate the percentages reported in the table. Q1. 3%, Q3. 14%., Q4. 38%. | | | | | | |

Most survey respondents believe that, as a result of the STEM ECHS, students will be much more or somewhat more prepared for STEM careers and STEM majors.

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| **Comparison: With or Without STEM ECHS** | | | | | | |
| **Survey Item** | **N** | **Much More**  **(%)** | **Somewhat More**  **(%)** | **Equally**  **(%)** | **Somewhat Less**  **(%)** | **Much Less**  **(%)** |
| As a result of STEM ECHS, how well prepared do you believe your students will be for STEM careers? | 29 | 59 | 34 | 3 | 3 | 0 |
| As a result of STEM ECHS, how well prepared do you believe your students will be for STEM college majors? | 29 | 62 | 24 | 14 | 0 | 0 |
| Note: Response options also included “Don’t Know.” None of the respondents selected that option. | | | | | | |

Nearly all survey respondents believe that their STEM ECHS will contribute to a reduction in achievement gaps between high- and low-performing students in their school/district. Similarly, most respondents believe that the STEM ECHS will allow their school/district to provide a higher-quality learning experience to students.

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| **Comparison in School/District: With or Without STEM ECHS** | | | | | | |
| **Survey Item** | **N** | **Much More**  **(%)** | **Somewhat More**  **(%)** | **Equally**  **(%)** | **Somewhat Less**  **(%)** | **Much Less**  **(%)** |
| As a result of STEM ECHS, how much do you believe your school/district will be able to reduce the achievement gaps in STEM disciplines between high- and low-performing students? | 27 | 19 | 70 | 7 | 4 | 0 |
| As a result of STEM ECHS, how much do you believe your school/district will be able to provide a high-quality learning experience? | 28 | 43 | 43 | 7 | 7 | 0 |
| Note: Response options also included “Don’t Know.” The percentages of respondents who selected those choices are listed below, but those respondents were not used to calculate the percentages reported in the table. Q1. 7%, Q2. 3%. | | | | | | |

Nearly half of all survey respondents indicated that they did not know if the assistance provided to their STEM ECHS by JFF and ESE had been helpful. This finding is not surprising, because nearly half of respondents were classroom teachers who have had minimal contact with ESE and JFF. Of those who responded, most reported positive or neutral perceptions of the technical assistance provided.

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| **Jobs for the Future and ESE Assistance** | | | | | | |
| **Survey Item** | **N** | **Strongly Agree**  **(%)** | **Agree**  **(%)** | **Neutral**  **(%)** | **Disagree**  **(%)** | **Strongly Disagree**  **(%)** |
| The technical assistance provided by Jobs for the Future has been helpful. | 15 | 20 | 27 | 40 | 13 | 0 |
| The assistance provided by the Department of Elementary and Secondary Education has been helpful. | 16 | 13 | 44 | 38 | 7 | 0 |
| Note: Response options also included “Don’t Know.” The percentages of respondents who selected those choices are listed below, but those respondents were not used to calculate the percentages reported in the table. Q1. 48%, Q2. 44%. | | | | | | |

**Technical Assistance Meeting**

ESE invited STEM ECHS representatives and their IHE partners to attend the Future Ready Summit, which was held on May 20, 2013. The Future Ready Summit brought together hundreds of education and workforce leaders from across the state to discuss steps being taken to build a statewide system of aligned and strategic partnerships to best support students in grades K-12, and then through college and careers.

Representatives from just three of the six STEM ECHS sites attended the meeting, as well as representatives from JFF and several IHE partners. This was a notable change from the previous three STEM ECHS technical assistance meetings, when representatives from all six sites attended. Although UMDI did not survey the six sites about this, we suspect that the change was because the STEM ECHS sites perceived the Future Ready Summit as less specifically targeted to their needs than previous technical assistance meetings were. Two STEM ECHS teams presented their work to a small group during a breakout session, and then the STEM ECHS representatives gathered to provide brief updates to JFF. Other Summit attendees were also invited to attend this update meeting.

**Feedback for JFF**

Feedback from interviewees on the technical assistance provided by Jobs for the Future was consistently positive. Interviewees from implementing sites indicated that JFF was viewed as a credible, reliable, and helpful source of technical assistance. Recent comments from interviewees at implementing sites included the following:

* Janice Davis has gone over and above. She helped us through some bumps. Is it two programs? Is it one program? Is there equal buy-in from the leadership in both [middle and high school] buildings? Janice helped us come in and confront some hard facts—I would like to commend that partnership with JFF as a real success this year. We have decided to create an overarching vision statement for the entire program, and the charge on the table now is to look at a specific mission statement for each building that could look a little bit different, but both feed in to the overarching vision. She helped us see some clarity on that and brought us together as a team.
* The support offered in seeing the big picture and developing a team has been very helpful. It has been most helpful when JFF hosts an event that brings the STEM ECHSs together.
* Janice has been fabulous. She has been in the school a half-dozen times this year. We got to talk to all of the other schools at the technical assistance meeting in Worcester. She is available by email anytime to answer questions and offer suggestions.
* When we first started creating our vision for what we wanted this to be, Janice Davis from JFF was very skeptical. She warned us that we did not have the capacity necessary, she warned us that we were not ready to jump in to the implementation phase before we had finished planning. She was very up-front about how dangerous it was to move forward. In hindsight, she was absolutely right. I would encourage her in the future to force sites to slow down and plan. Having clearer benchmarks for what is required to shift from planning to implementation with some hard evidence that there is capacity to support the plan. I think we lost a year, or over a year, because we were planning and implementing at the same time, which we are still doing.
* They are helpful. They are very data-based, very research-based, which is helpful. Sometimes those of us who are more in the field and have a steady stream of students at our door kind of believe in data, but we don’t take the time to do the research. So it is helpful to have people who say, ‘okay, here are some best practices out there. Here are some things that other places have shown to work’.

When asked what supports from JFF had been helpful, interviewees shared the following:

* JFF has been helpful in helping us prioritize challenges.
* We are currently working on a marketing plan to try to get the program out there. We had eighth graders come to [the high school]. A few teachers put a cool slideshow together. The guidance counselor is going to all of the middle schools to do a presentation about the STEM ECHS.
* We have spoken with Janice Davis about growing the program vertically, but also increasing program offerings and branching out to the other academies.
* Janice Davis suggested that things be in writing so that everything was clear, and to create a record. She is very helpful. She checks in regularly.
* We are getting some feedback on how to go about establishing a new partnership with an IHE.

Interviewees shared several requests for technical assistance, including:

* Any feedback on scheduling issues, transportation issues, cost issues [would be helpful].
* What we could probably use is more professional development on the ground-level stuff that happens in the classrooms. What can our classrooms look like day to day? From what I have seen, JFF has a lot of experience with the classroom level stuff, and I would like to see some more of that embedded in what the program looks like. In a perfect world I would like a person from JFF on the ground, working with teachers in classrooms, and basically assessing, for example, how to implement an instructional framework.
* Would like to hear more from JFF about supporting students who struggle with increased levels of rigor. Would like to have conversations about specific strategies that can be used in the classroom to support students.
* We would like to visit other STEM sites and see the programs in action.
* JFF has voluminous amounts of information on STEM ECHSs. They have a lot of research on the topic. We would like them to share more of that knowledge with us.

An interviewee from the non-implementing site indicated that, by choice, the school had not interacted with JFF recently, and described the school’s relationship with JFF by saying, “Jobs for the Future has been the least involved in this. They have come to understand that we have so many other partners that we are working with that they have very respectfully stepped back and said, ‘call us when you need help’.”

**Feedback for ESE**

The three IHE partners interviewed prior to this report provided only brief comments about their interactions with ESE. All three IHE partners reported that they have had minimal contact with ESE regarding the STEM ECHS, and were unaware of their partnering districts’ reporting and funding obligations related to the RTTT award. One IHE partner said, “[We] need to be aware of the goals, roles, and responsibilities of [our partnering district], and those expectations and guidelines have not been communicated to [us] by ESE.”

As reported previously, feedback from awardees about collaboration with ESE has been uniformly positive. Recent comments from interviewees included the following:

* They are flexible and understanding. The expectations are rigid, but they understand that every school needs to meet those expectations in different ways. So we have been given a lot of flexibility in terms of meeting those expectations.
* Nyal has been incredibly supportive and understanding of what is taking place. They have been very patient and helpful in helping us get things done. Whenever we have called them to help us expedite something, to deal with something, they have always been great about doing that. I am not used to the idea of having people say, ‘How can we support you?’ They have been very understanding and helpful, so that we can take advantage of what is there to offer. They are there to support us.
* Always available. Easy to contact by phone or email. Helpful with the grant and the budget.

Several interviewees said that it would be helpful to continue sharing information on successes and best practices across sites. Interviewees indicated that technical assistance meetings have been helpful in this regard, and welcomed more opportunities to share and discuss experiences as a group. One interviewee said,

It would be great if ESE could get the STEM ECHS coordinators together for a sharing session—to share best practices. Hosting a showcase of exemplary practices for STEM ECHSs would be great. To a certain extent we feel like we are tackling issues in a vacuum, and that is our own fault, but I would welcome more opportunities to meet with other schools and learn from them. ESE could certainly facilitate that.

Several sites commented that they hoped that ESE shared their concerns about sustainability. Three interviewees said that they hoped ESE would play a larger role in coordinating conversations among the multiple constituencies with a stake in the STEM pipeline (i.e., Higher Education, K-12, and industry). One interviewee said,

We all seem to be on different pages at times. The state needs to really grab onto [and support] a concept [like the STEM ECHS model] that has really linked the three and then start wholesaling this idea and telling industries, colleges, and schools, ‘if you want to be involved in this, this is how it is working, and here is how it has worked here’.”

Another respondent presented a cogent description of their sustainability dilemma—and an argument for increased involvement from the state. The quotation is long but seemed worth presenting in its entirety:

It is very difficult for school districts to go to an industry or company to ask for money. Much of industry is not well versed in the need to invest in schools. Whose job is it to educate them in that? And, who is the best person to sell it? One may argue that it is not a school district. When you go to a company and say, ‘I am a representative of school X, and here are all of the wonderful things we are doing. We need X, Y, and Z for these reasons’, they may look at it and say, ‘you are not the credible source that needs to come and say to us that you need money’.… I really feel like the state should be more involved in having industry invest in schools. I think that benchmarks could be set, that discussions at higher levels could take place around industries’ and companies’ needs, and what they are willing to invest to see results around those needs. I think a little more consistency needs to happen with that. When a school works with industry it is the same concept as having a school with a few great classrooms and a few classrooms that are not on par. You are operating in silos. So if [our district] is able to pull this together and actually start to get some leverage or some buy-in from companies, where does that leave [the other STEM ECHSs in this group]? Where does that leave the [district name] Public Schools? So why would we operate in silos as school districts when we recommend that it not happen in other areas of life that are so important? We are part of a statewide initiative. It would be very helpful if people at the state level had conversations with industry leaders and asked, ‘what is it that you are looking for from the STEM pipeline, and how can you contribute?’ Because let’s face it, a lot of what we are doing [with our STEM ECHS] has happened because our district has bought into the concept that we are an essential part of the STEM pipeline. We are going to do everything we can with our education resources and our funding resources to ensure that more kids come into our economy ready to take the jobs that need to be done. Ultimately, the people who determine that are the people at the other end of the pipeline who are saying, ‘we need people to fill these positions’. So I think more conversation at the state level has to happen. In a perfect world [a representative from our district] could go onto a website and look at an array of companies that have worked with the state, and have made a commitment to financially support STEM education if certain criteria are met. … That is what we need to start doing as a state a little bit better to give opportunities like the STEM ECHSs better support.

**Conclusions and Strategic Considerations**

* **Sustainability continues to be a primary concern for all STEM ECHS sites and IHE partners.** Several STEM sites expressed a desire for ESE to become actively involved in conversations regarding sustainability of the STEM ECHS sites. Most sites see ESE as a partner or stakeholder in the STEM ECHS initiative, and would like to hear ESE’s perspectives on and strategies for addressing sustainability concerns.
* **Several STEM ECHS sites are still developing or significantly modifying their curriculum and planned course sequences.** ESE may consider supporting districts’ efforts to plan curriculum and course sequences at future technical assistance meetings. One of the six STEM ECHS sites has clearly articulated a course sequence for their STEM ECHS students, which could serve as a resource for other sites. Several sites are working with their IHE partners to determine what college courses will be available for students. All programs are still building their curriculum, and at two sites this process was started from scratch during the 2012–13 school year.
* **Many sites are working to develop systems for student support.** Most sites did not place an explicit focus on planning student supports during their initial implementation phase, but all are aware of the need for increased levels of student support. Implementing sites have generally been more concerned with issues related to staffing, logistics, curriculum development, sustainability, and building effective relationships with IHE partners. ESE may consider emphasizing student support strategies at future technical assistance meetings.
* **Four sites are exploring the possibility of working with additional IHE partners to expand college course offerings, increase programming flexibility, and maximize the impact and efficiency of their programming.** Some sites are struggling to determine what type of IHE partner will best meet their students’ needs over the long term. Interviewees said that some students want to attend a four-year college, and that it made less sense for those students to take courses from a community college. Other sites’ interviewees said that some of their students plan to pursue associate’s degrees or professional certifications at community colleges, and that it made less sense for those students to take courses at four-year institutions, which often charge more per credit earned. ESE may consider supporting districts’ efforts to assess existing partnerships and establish new partnerships as needed.
* **Staff turnover has hindered the development of some STEM ECHS sites.** Turnover in STEM ECHS personnel appears to have been coincidental in some districts, but in others it seems likely to signal a lack of commitment to the program. Two IHE partners have also recently reassigned staff to manage their STEM ECHS partnerships. To minimize the negative impacts and maximize the productivity of such transitions, succession planning could be a useful topic for a future technical assistance meeting.
* **Students’ experiences with college-level coursework vary widely by site.** Two sites are currently providing students with the opportunity to take courses at college campuses before school, after school, or during the summer. These students also have the opportunity to take college courses online. The other three sites offer college courses at their high schools during the regular school day, with the support of adjunct faculty from their partnering IHE. Having sites share their different approaches to offering college courses could be a useful topic for a future technical assistance meeting.

# MassCore Policy and Implementation

## Methods

This report includes information collected from the following data sources:

* *Interviews with district data administrators.* As discussed in the 2012 Annual Report of the RTTT C&CR evaluation, “Meaningful assessment of changes in MassCore completion is challenged by serious validity and reliability limitations of the MassCore element of the SIMS database.” As one step toward providing information relevant to improving the quality of the MassCore SIMS element, UMDI conducted interviews with district data administrators, focusing on the processes by which districts determine the value of the MassCore SIMS element, and related challenges. The interview protocol (see Appendix K), was developed in collaboration with ESE. Interviewees were selected from the following four groups, based on judgments by UMDI and ESE that their reported MassCore completion rates were surprisingly low or high:
  + Comprehensive high schools that reported 0% MassCore completion.
  + Career and technical high schools that reported 0% MassCore completion.
  + High schools that reported 0.2–7% MassCore completion.
  + High schools that reported 100% MassCore completion but had a 4-year graduation rate below 80%.

The goal was to interview two districts from each of these groups. Three districts were selected from each group, with one district designated as an alternate in case one or both of the other two districts were unavailable, unwilling, or subsequently determined to be inappropriate for the interview.

* *ESE auditor reports.* As part of the federal Longitudinal Data System Grant Program (LDS), ESE conducted audits of four districts during the 2012–13 school year, comparing student records to data reported by the district to ESE, in order to assess accuracy. Two of the audit reports were made available to UMDI as part of the MassCore evaluation.
* *ESE databases.* To select districts for the data administrator interviews, UMDI utilized the 2011–12 district MassCore completion rates presented on the School/District Profiles section of the ESE website at <http://profiles.doe.mass.edu/state_report/masscore.aspx>.
* *Communications.* UMDI communicated by email, phone, and interview with the ESE program manager and the ESE research project manager for MassCore.

## Findings

**District Data Administrator Interview**

As noted above, three districts from each of four categories were selected for the data administrator interview, with one district from each group serving as an alternate. The alternate was needed in 3 out of 4 categories, so 11 of the 12 districts were eventually contacted. In all cases, the primary district contact provided by ESE was contacted by email, followed up by a second email if there was no response. In several cases, UMDI was told to contact someone else in the district, and in some cases this led to a third or even a fourth contact. For districts that did not respond, ESE approved the additional step of UMDI conducting Internet searches to identify additional contacts and making calls or emails accordingly.

One contact elected not to participate, saying that her district was not required to participate because it was not receiving Race to the Top funds. Six additional districts were contacted multiple times but did not respond.

Five interviews were conducted. UMDI reported to ESE that these interviews had yielded much useful information, and ESE said that these interviews constituted a sufficient sample. The number of interviewees fell into the four categories as follows:

* (N=1) Comprehensive high schools that reported 0% MassCore completion.
* (N=1) Career and technical high schools that reported 0% MassCore completion.
* (N=1) High schools that reported 0.2–7% MassCore completion.
* (N=2) High schools that reported 100% MassCore completion but had a 4-year graduation rate below 80%.

**District process for determining MassCore completion status.** When asked to explain their process for determining a student’s MassCore completion status, two districts said that guidance staff review students’ individual transcripts by hand, and one said that software calculated completion status based on course codes and grades entered into a student information system. The latter district said that their graduation requirements are fully aligned with MassCore, so that any student who completes graduation requirements has also completed MassCore. One district said that they don’t bother calculating completion status, because they know that no students have completed MassCore requirements.

In the final district, the information technology coordinator said that she had never calculated MassCore completion status, because the principal had told her not to calculate it, and so the district reported that no students had completed MassCore. In the seven weeks between my initial interview and a follow-up call to the district, the district had calculated completion status for all students via transcript review. The contact said that this process had been catalyzed by UMDI’s initial call, and that the district’s completion percent would now rise from 0% (as reported in 2011–12) to an estimated 80% (for 2012–13).

**Challenges and questions in determining MassCore completion status.** Four out of five districts reported challenges or questions related to determining a students’ MassCore completion status. Only one district reported that the process was entirely straightforward. In this district, any student who meets graduation requirements has also met MassCore requirements. The challenges reported by the other four districts are discussed below.

***Physical education.*** Multiple districts reported issues related to physical education (PE) and MassCore. It became clear that districts are not applying PE requirements uniformly, that conflicting versions of the PE requirements are currently provided on the ESE website, and that the PE requirements are written in a way that permits different interpretations by different districts. This situation appears to be an impediment to uniform reporting of the MassCore indicator, and therefore an obstacle to the state’s intention to use the indicator to assess improvement in students’ college and career readiness.

One district said that it was reporting 0% MassCore completion, because it believed that students were not taking enough PE. In contrast, another district was not including PE in MassCore calculations, citing a document currently available on ESE’s website that does not mention PE as a MassCore requirement (see www.doe.mass.edu/ccr/masscore/MassCoreEducators.docx). In addition, the brief, official description of MassCore on ESE’s main MassCore web page (at <http://www.doe.mass.edu/ccr/masscore/>) mentions all current MassCore requirements except for physical education: “The recommended program of studies includes: four years of English, four years of Math, three years of a lab-based Science, three years of history, two years of the same foreign language, one year of an arts program and five additional ‘core’ courses such as business education, health, and/or technology.”

That same web page links to a one-page summary of the current MassCore requirements, which does mention physical education, but doesn’t specify a required amount of PE. Summing the required credits for English/language arts, mathematics, science, history, foreign language, the arts, and additional core courses yields 22 units, which is shown as the minimum for MassCore. This means that zero credits of PE are required for MassCore, although the guidance provided in the table reads: “Physical Education – As required by law. State law (M.G.L. c. 71,s. 3) states: ‘Physical education shall be taught as a required subject in all grades for all students’. Health can be integrated into Physical Education, science, or taught as a stand-alone course.”

Given these materials, it is not surprising that districts are interpreting and applying PE requirements inconsistently. UMDI discussed this with the ESE program manager for the MassCore component of the evaluation, who affirmed that the language is vague, and that this has been a known problem for years, but that it would be a worthwhile topic for inclusion in the evaluation. He further explained that,

The issue is that many years ago, the amount of time was actually delineated at both the elementary school and secondary school levels. As time went on … those time requirements disappeared, so is [the requirement] a full-credited health/physical education program, or is it five minutes of yoga?

He also noted that “physical education is the only coursework required annually of all students under MGL Ch 71 S. 3, technically not required for credit, but required to be taken.” A document about MassCore on the ESE website (at <http://www.doe.mass.edu/ccr/masscore/qanda.pdf>) further supports the contention that districts have broad discretion in how to interpret and apply the MassCore physical education requirements. The document includes the following question and answer

Q: What changes have been made to the current physical education requirements?

A: None. [Mass General Law, Chapter 71: Section 3](http://www.mass.gov/legis/laws/mgl/71-3.htm) requires that physical education be taught as a required subject in all grades. The MassCore framework includes that legal requirement. Note: State law gives school officials considerable flexibility in designing the physical education program. For example, school officials have authority to determine the hours of instruction for physical education, as they do for all other subjects of instruction. Further, school officials have discretion to determine whether and how a student, particularly at the high school level, may meet the physical education requirement through an organized program of instructional physical activity such as participation in interscholastic athletics, or skating or swimming lessons through a private instructor or a community program, or through an independent study. This discretion is similar to the authority of school officials to permit a student to fulfill the requirements of an academic course by taking a course elsewhere that they deem to be equivalent.

***Career and technical education (CTE) schools.*** The one CTE school interviewed reported MassCore-related issues that may apply to other CTE schools as well. The interviewee said that no students are completing MassCore requirements as understood by the school. A central issue was that their students have academic courses every other week (and vocational courses the other weeks), so they only have 90 days per school year of 42-minute meetings in their academic courses. The interviewee reported that the school asked ESE for guidance regarding what constitutes sufficient course hours to meet MassCore requirements, and that ESE said the district should make that decision. The informant found that frustrating. She believed that ESE will eventually create a more explicit standard, and that the extensive changes the school is making to comply with their internal interpretation of MassCore will then be shown to fall short of that standard.

The district decided to use Carnegie units, or 120 hours of class time, as the requirement to qualify a course for MassCore. Based on this definition and analysis of their calendar, they determined that their students could meet MassCore requirements if the school extended the day by 30 minutes, increased physical education offerings, dropped foreign language offerings (because MassCore does not require foreign language or fine arts for CTE students), and added requirements for additional lab science and history courses. The school intended to make these changes over a three-year period, and was engaged in contract negotiations with teachers regarding the half-hour extension to the school day.

This school provides an illuminating example of the implications of the current MassCore guidelines for individual districts. The MassCore guidelines appear to be a powerful lever for change in this school, resulting in substantial structural changes intended to increase students’ academic attainment. More concerning is the school’s frustration with what they perceive to be inadequate guidelines for what constitutes a course or unit of credit. ESE explains in the MassCore Q&A document cited above that “students should be given credit for demonstrating the content skills and knowledge outlined in the Massachusetts Curriculum Frameworks. School districts determine if the coursework has met the grade level standards outlined in the Massachusetts Curriculum Frameworks.”

The CTE school we interviewed is clearly finding it difficult to make this determination, and is therefore defaulting to the historical standard of Carnegie units—which puts them in company with the many school districts whose credit determination is still largely based on seat time. While there is no simple answer to their challenge, it is notable that an apparently conscientious district such as this one, which is making extensive efforts to comply with that they *perceive* to be the seat time requirements, may be making substantial course changes and financial investments that are either not required (e.g., increasing PE time) or of debatable merit (e.g., eliminating their foreign language offerings).

While a sample of one school is insufficient to draw broad conclusions about the implications of MassCore for CTE schools statewide, it is clear that MassCore presents opportunities and challenges for CTE schools, and that they could benefit from sharing their MassCore-related understandings and reforms with each other. For ESE’s intended uses of the MassCore completion indicator in SIMS, it would also be useful to know the extent to which the range of reported completion rates (e.g., 15 CTE schools reported 100% MassCore completion in SY12) represents actual differences in course offerings and student attainment, versus differences in interpretation of the MassCore guidelines.

***Perceived tension between MassCore and existing graduation requirements.*** One district noted that due to their serious problem with low graduation rates, they are not motivated to introduce additional graduation requirements (e.g., two years of the same foreign language), even if those graduation requirements would bring the district into line with MassCore. Their decisions are motivated in part by the fact that there are consequences for having a low graduation rate (e.g., Level 4 status), but not for having a low rate of MassCore completion.

**Technical assistance needs.** All interviewees were asked “Are there specific resources or technical assistance that would be helpful in developing your district’s process of determining a student’s MassCore completion status?” The only explicit technical assistance needs were requests for a clearer definition of what constitutes a course, and as much advanced notice as possible of any changes in MassCore completion requirements.

**Auditor Reports**

Both of the ESE auditor reports provided to UMDI found high rates of accuracy when student transcripts were compared to the MassCore indicator from SIMS that the district had provided to ESE. However, UMDI was not able to conclude from these findings that Massachusetts districts in general are reporting the MassCore indicator accurately. We were unable to obtain the selection criteria for the audited districts, or the reports for the other two districts that were audited. As discussed below, our interviews with district data administrators reinforced the validity concerns expressed in previous UMDI reports.

## Conclusions and Strategic Considerations

* **Improved accuracy of MassCore reporting should be attainable through low-demand actions and interventions.** Findings from the data administrator interviews make it clear that misunderstandings are reducing the accuracy of MassCore reporting. Findings also suggest that districts are eager to report accurately and increase completion rates. Continued education and outreach efforts might therefore achieve important successes. In addition, if ESE lacks the resources to conduct conversations and/or audits with each district, a district self-audit tool may be successful in clarifying basic misconceptions, such as those described in the interview findings above. Such a tool could include a series of questions and checkboxes to help districts ascertain that they are understanding the components of MassCore completion and reporting them accurately. It could also serve as part of the MassCore needs assessment and improvement plan described by ESE as a performance measure for RTTT Goal 4A. Finally, this process could include identifying which district personnel are primarily responsible for the determination of students’ MassCore completion status. This information, which ESE appears to lack currently, would improve district responsiveness to MassCore-related communications.
* **Clarifying the relationship between physical education requirements and MassCore completion could improve reporting accuracy.** Achieving clarity is made challenging by the vagueness of Massachusetts law regarding PE requirements, and the available MassCore guidance documents suggest a reluctance to say publicly that meeting the requirements could be accomplished by five minutes of yoga, or that students are apparently required to take PE but not to pass it. Nonetheless, while it is clear that some districts are providing adequate PE to meet the letter of the law, only some of these districts are counting those activities toward MassCore completion. These districts also seem to be making minimal use of their ability to count extracurricular athletic activities toward MassCore completion, as at least one district that reported 0% MassCore completion based on perceived PE shortcomings surely had students who were participating in substantial extracurricular athletic activities.
* **ESE may wish to work toward having the Student Course Schedule database replace the MassCore indicator in SIMS.** (UMDI wouldn’t be surprised to hear that ESE is already considering and/or pursuing this strategy.) Once SCS gains sufficient years of data, it may be possible to use SCS to determine MassCore completion status for most students, although not for those who transfer into the state having already earned some high school credits. While this would circumvent some of the potential inaccuracies and misunderstandings in district reporting, it would of course be subject to inaccuracies in district reporting of student course completion, and would require the ability to draw clear conclusions regarding whether courses reported in SCS meet the requirements of specific Massachusetts Curriculum Frameworks.

Massachusetts Race to the Top College and Career Readiness Initiatives

Interim Evaluation Report, September 2013

Prepared for the Massachusetts Department of Elementary and Secondary Education

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# Introduction

The Massachusetts Department of Elementary and Secondary Education (ESE) was awarded a federal Race to the Top (RTTT) grant for the years 2010–2014. The college and career readiness (C&CR) components of the grant were designed to help students develop “knowledge and skills necessary for success in postsecondary education and economically viable career pathways.” The RTTT initiatives are intended to provide students with opportunities to participate in quality, upper-level high school coursework and new approaches to assist them with high school completion and transition to higher education and the workforce. These programs are part of a broader effort, as specified in the Delivery Plan of ESE's College and Career Readiness group, to increase the Massachusetts 5-year high school graduation rate to 88.3% and the number of students who complete the MassCore program of study to 85.0% statewide.

The UMass Donahue Institute is conducting an evaluation of three of the C&CR components of the Massachusetts RTTT efforts—the Pre-AP Teacher Training Program, the STEM-focused Early College High Schools (ECHS), and the MassCore Policy and Implementation initiative.

This document is the last in a series of three reports for Year 3 of the evaluation (10/1/12–9/30/13). The other two were presented in January and June 2013. The primary purpose of these reports is to provide ESE with timely information and feedback that can be used for program monitoring, improvement, and technical assistance. Different depths of information are provided for different programs, depending on the scope of each program, the timing of the Year 3 evaluation plan activities and availability of data sources, and UMDI’s understanding of the relative priority of each aspect of the evaluation.

# Pre-AP Teacher Training

## Background

The aims of the Pre-AP Teacher Training program are to increase the number of low-income and minority students prepared to participate and succeed in mathematics, science, and English Advanced Placement courses and credit-bearing college-level coursework; to provide teachers in grades 6–12 with high-quality professional development to assist them in developing curricula, instruction, and assessments that prepare students for AP coursework; and to provide an opportunity for teachers to collaborate in horizontal and vertical teams and to network with other teachers in their region for the purpose of improving curriculum and instruction.

Technical assistance for the Pre-AP Teacher Training program during Years 1–3 has been based on the Laying the Foundation (LTF) curriculum and provided by the Massachusetts Math + Science Initiative (MMSI), a project of Mass Insight Education in partnership with the Commonwealth of Massachusetts. Cohort 1 districts are those who completed their Pre-AP training before the beginning of the 2011–12 school year. Project 4D districts are those who paid for their Pre-AP training and technical support using RTTT Project 4D funds and who have agreed to send the same teachers for four-day trainings in three consecutive summers, to create vertical teams of teachers, to hold quarterly vertical team meetings, and to have “lead teachers” who organize and run the vertical team meetings and attend an additional training day for lead teachers. Project 4D districts are the primary focus of this evaluation. Other districts are using RTTT Goal 4A or non-RTTT funds to enroll teachers (hereafter referred to as “non-4D teachers”) in the Pre-AP program, but those districts are not required to commit to vertical teaming and sending teams for multiple years of training.

The state’s RTTT scope of work indicates that the performance goal for Pre-AP is 1000 teachers trained at the end of the 2011–12, 2012–13, and 2013–14 school years. ESE has clarified that ‘1000’ refers to the total number of summer training participants, whether Project 4D or other, and whether participating for multiple years or just one. So, for example, the goal could be met by 200 teachers who each attend for three summers, plus 400 teachers who only attend for a single summer.

The evaluation questions specific to the Pre-AP evaluation are listed below.

**Process Evaluation Questions**

1. In what ways have grantees implemented Pre-AP program components? What are the major challenges to and facilitators of successful program implementation encountered by grantees? What midcourse corrections and attempts to overcome challenges have been undertaken? What additional steps are planned?
2. In what ways has ESE implemented the Pre-AP program components described in their RTTT grant application? What are the major challenges to and facilitators of program support and facilitation encountered by ESE? How have challenges been overcome and midcourse corrections undertaken? What additional steps are planned?
3. How do Pre-AP program teachers and administrators rate and explain the quality, relevance, and effectiveness of major program components and services?
4. What infrastructure, systems, and processes were put in place to aid Pre-AP program sustainability during and beyond the grant period? What are the greatest challenges and barriers to creating sustainability?

**Outcome Evaluation Questions**

1. To what extent are students served by the Pre-AP program achieving improved outcomes in college and career readiness indicators including graduation, participation and success in AP courses and exams, measures of academic achievement (e.g., MCAS, SAT), and MassCore completion?
2. At the school and district levels, do observed changes in students served by the Pre-AP program differ across student characteristics such as gender, race/ethnicity, free/reduced lunch status, ELL status, and special education status? Is there evidence that gaps are narrowing? Are program services reaching students who are at the greatest risk?
3. To what extent are observed changes in student outcomes attributable to Pre-AP program activities versus other RTTT program activities and/or measurable contextual variables?
4. What differences in program features, implementation, and contextual variables can be identified across programs whose levels of improvement differ substantially?
5. What is the relationship between level of program implementation and achievement of targeted student outcomes?

## Methods

This report includes information collected from the following data sources:

* *Interviews of teachers and administrators.* During site visits to three Project 4D districts, four interviews were conducted with the district’s Pre-AP administrator, the Pre-AP lead teacher, a Pre-AP trained middle school teacher, and a Pre-AP trained high school teacher (see interview protocols in Appendices A and B).
* *Observations of vertical team meetings.* During each of the three site visits, vertical team meetings were observed (see observation protocol in Appendix C).
* *Classroom observations.* During each of the three site visits, one of the interviewed teachers was also observed conducting an LTF activity. Observation notes were based on the “Observable Indicators of Effective LTF Teaching” protocol, adapted by LTF from the UTOP Classroom Observation Protocol (see Appendix D)
* *Interview of ESE program manager and project director.* An in-person interview was conducted in September 2013, in addition to scheduled and informal email and phone communications throughout the year.
* *Interviews of technical assistance vendor.* Two phone interviews were conducted with MMSI’s director of the Pre-AP program in February and August 2013, in addition to scheduled and informal email and phone communications throughout the year.
* *Training registration and attendance database.* MMSI developed and populated a database that tracked teacher, lead teacher, and administrator registration and attendance at Pre-AP training.
* *ESE documents and databases.* ESE provided the state’s SIMS, SCS, and AP databases, as well as a spreadsheet that indicates which districts ESE is designating as Project 4D.

Three site visit districts were selected based on criteria of highest priority to ESE: specifically, Project 4D districts in their second year of implementation with a large number of trained teachers and a high percentage of at-risk or high-need students. Each site focused on one of the three disciplines in which Pre-AP training is offered (i.e., English language arts (ELA), mathematics, and science). Site visits included interviews with an administrator, the lead teacher, and two other teachers in a single academic discipline, as well as observations of a vertical team meeting and a teacher delivering an LTF lesson. The site visits took place from March through June 2013.

## Findings

**Teacher and Administrator Interviews**

Interviews at the three site visits were conducted with administrators and middle school, high school, and Pre-AP lead teachers. Their perspectives on the topics explored in the interview are presented below. The three site visit districts are at times referred to as the mathematics district, science district, and ELA district.

**Implementation of LTF activities and assessments.** Teachers were asked how many LTF activities and assessments they had used. Teachers reported having conducted from 5–20 LTF lessons. It is not appropriate to think of these numbers as annual or representative rates, given that the interviews were conducted at different times during the school year (March and June) and with non-randomly selected teachers. However, they do give a sense of implementation for this small sample. One teacher reported that she had conducted 6–8 LTF lessons with her “standard” classes and 20 LTF lessons with her “honors” class. Most teachers also reported that conducting each LTF lesson (including labs) required 2–3 class days, with the exception of a teacher whose classes were 90 minutes long and could sometimes complete an activity in a single class period. Completion time also varied based on the type of LTF lesson, with some lessons described as more worksheet-based and requiring less time to complete, and others described as more product- or project-based and requiring more time to complete.

Two administrators also commented on the number of lessons implemented. One pointed out that their district’s letter of agreement with ESE specified that teachers would be expected to complete two LTF lessons per year, and that her sense was that teachers were exceeding this threshold substantially. Another administrator discussed a wide variety of ways that LTF activities are incorporated into classrooms:

I would say it varies by grade level, and it varies by teacher. I’ve seen teachers using LTF lessons once a week, or incorporating parts of LTF activities as part of stations once a week, so different students are doing different parts of the LTF lesson. I’ve heard of teachers making an LTF lesson their big project, like at the end of a domain or an end-of-unit project. And I think that in some classrooms, they do part of an LTF lesson daily, as either part of a warm-up or part of a station.

Multiple interviewees in the district that is implementing Pre-AP ELA emphasized that their district is utilizing Pre-AP strategies extensively, even in activities that are not LTF lessons. For example, they have incorporated text annotation and dialectic journals as tools for increasing the depth of students’ knowledge, and they ask students to apply these strategies across grade levels and with a wide range of texts (e.g., fiction, non-fiction, and poetry). Nonetheless, these ELA teachers also reported conducting specific LTF lessons. One English teacher also said that the LTF assessments have brought the dimension of timed assessments into their middle school classrooms. She explained that students haven’t previously completed timed assessments, because the MCAS isn’t timed. She felt that middle school students need practice with timed assessments, because they will be required in high school and on the SAT.

Teachers reported utilizing LTF assessments much less than LTF lessons, with three out of six teachers not using them at all. Only one teacher reported using them extensively—she estimated 17–20 times—but typically she only drew a few items from an assessment that contained many items. Another teacher said she had used LTF assessment items as warm-up or partner activities, but for formal assessments she felt that she needed to use more standard assessments prescribed by the district. One teacher reported that she is much more focused on using sample MCAS and PARCC items, particularly because students’ MCAS performance is now a consideration in teacher evaluations in their district. Finally, one teacher said that the content of LTF assessments doesn’t match the content in the school’s required text materials.

**Changes to classroom practice**. Teachers were asked if they had made changes to their teaching and assessment practices as a result of the Pre-AP training. One of the mathematics teachers reported that she is conducting more formative assessment than before, and both mathematics teachers reported conducting more small-group activities that add an element of exploration and discovery:

The Pre-AP lessons have less of the whole-group activities, and give the kids more working together. Previously, it’s been lots of whole-group, talking at the students, telling them, “This is how you do it.” LTF really lets them discover it on their own, as I guide them. They need that guiding to jump start them, especially at the middle school level, but it has changed a lot—less of me talking, more of them doing the work.”

The other mathematics teacher said,

I definitely expect more from my students than I did previously. I’d say that the rigor has definitely gone up, and, as a result of that, they have surprisingly risen to the occasion. You still have students who aren’t going to persevere through the problems as much, but for the most part it’s been quite a pleasing surprise to see that students do react quite positively to the activities.

When asked what she meant by increased rigor, she described LTF providing opportunities for students to think more independently and have their own ideas about mathematics. She said,

That’s something that has really only started recently. And that’s the kind of thinking that we want them to have, which is “I want you to be the mathematician. I want you to realize that there is more than one way to do things.” So that kind of thinking has been really new … Pre-AP has presented ideas to students that are far more analytical, and far more outside the box than what’s typically given in a math book. So it’s been great in that respect.

This teacher also said that what she has learned through Pre-AP training has made her feel that being more creative and fun in her teaching is acceptable and desirable. She described activities she had recently created related to the *CSI* television shows and the *Hunger Games* movie that were fun for students, but still rigorous, and she didn’t think that she would have created and taught those types of activities before the Pre-AP training: “It’s giving me kind of a creative license. Before I was sticking to the book, whereas now I’m permitted to be a little more rigorous, a little more analytical, allowing them a little bit more challenge, and, again, it’s been a very surprising and pleasing thing.”

One administrator described this type of shift as requiring courage from teachers, “because it’s moving away from the comfort of the textbook, having to give up more of being the one leader of the class. Instead of standing up there and running the lesson, they’re actually letting the students kind of figure out the math by doing the LTF lesson. And that’s hard for some people to do.”

One science teacher noted that the LTF labs provide strong opportunities for differentiation, so she can use them with all four levels of classes she teaches, and her more advanced students can progress to more advanced material when they have completed the standard aspects of the lab. The other science teacher appreciated that the LTF labs focus on building students’ ability to use scientific methods, even if those labs don’t specifically target content standards of the Massachusetts curriculum frameworks. One English teacher said that the Pre-AP program has brought new, valuable practices to the English department, including asking students to synthesize multiple, unfamiliar texts on demand, as well as a new focus on non-fiction texts and grammar, which she believed would be helpful both on the AP English Language exam and in daily life.

Across disciplines, all teachers said that they were implementing LTF activities with all students, not just with the most academically advanced students. The primary difference across students of different academic ability levels was the amount of scaffolding and modification of materials necessary, with teachers asking some students or classes to complete a greater number or greater difficulty of items than others, or to do so more independently. One teacher said, “My colleagues were like, ‘Really? You want to try that with kids? Do you think it will be too challenging?’ And I said: ‘No, not if they’re guided.’ And they absolutely loved it! And they really got the concepts.”

Increases in use of technology (e.g., calculators, probes, spreadsheets) as a result of Pre-AP training were reported by most mathematics and science teachers, due to greater exposure to these tools during LTF training and vertical team meetings, as well as availability of quality LTF activities which draw on technology tools. The one teacher who reported no increase explained that she had already used technology tools extensively prior to the Pre-AP training. A major obstacle was that the mathematics and science districts had very limited access to graphing calculators, probes, and computers. Accessing these tools often required advance planning and communicating with technology personnel, so teachers couldn’t count on being able to access these tools spontaneously or just have them around for students to utilize. One teacher also noted that many LTF activities required materials that were unavailable (e.g., oranges) or required more set-up time than was possible in the few minutes between class periods, and that she tended to focus on the activities that avoided these challenges. Administrators reported that they were attempting to obtain funding for additional classroom resources.

**Structures for promoting implementation.** Site visit schools and districts used diverse strategies, ranging from supports to requirements, to promote implementation of Pre-AP activities. MMSI developed a spreadsheet and Moodle site that enabled teachers to quickly identify LTF mathematics activities that corresponded to specific Common Core State Standards, and the district strongly encouraged teachers to utilize these resources. Another district features an ELA instructional strategy during each department meeting and often during common planning periods, and these strategies are frequently selected from LTF materials. Tools and approaches such as these could also help one teacher who reported that LTF provided so many high-quality activities that it was difficult to select which ones to utilize. In one district, a lead teacher who was also a district administrator reported conducting LTF labs in individual classrooms in order to make it easier for classroom teachers to become familiar with and adopt new labs.

All three site visit districts created forums—including vertical team meetings, curriculum meetings, and common planning periods—for teachers to discuss LTF activities they had conducted and share student products from those activities. This included both successful and unsuccessful activities to help fellow teachers decide which ones to utilize in their own classrooms and to help administrators identify activities for possible inclusion in district curriculum documents.

Of three site visit districts, the mathematics and science districts had recommended levels of implementation of LTF activities, and the ELA district had required levels of implementation. The mathematics district recommended that teachers implement at least one LTF activity per year in each of the discipline’s five curriculum domains. The science district created a list of about five LTF labs at each grade level that all teachers in the district, including those who were not trained in the Pre-AP program, are strongly encouraged but not formally required to implement. The Pre-AP trained teachers are encouraged to support other teachers with implementing these labs, including offering to co-teach the labs. One teacher described this collaborative process favorably:

It’s nice, because instead of saying, “Hey, I found this great route,” or “This worked really well,” and then you sound like a Miss Nancy Know-it-all or something. Here with LTF we’re supposed to team up with someone in that building who didn’t do the Pre-AP training program and share ideas with them. So, it’s a great ice breaker to say, “Hey, I’m doing this thing and do you mind kind of listening to some ideas that I have to share with you?” And they’re very receptive to it, because they feel like they’re doing you a favor—which they are—but then they kind of get pulled into it like, “Oh wow, that is an interesting lab.” And what I’ll usually do is I’ll invite them in, I’ll say, “I’m doing this new lab with LTF, so if you want to come into my classroom and see me work through this one, you’re welcome to come in and see if you like it.” At first I started off with just telling them “This is what I did, and here’s a copy of it.” And now I’m just inviting different people in and saying, “Hey, do you want to come watch this? I know you’re going to be doing this section in the book, and this lab works really well.” And they like that, too.

The ELA district has specified a set of LTF activities and strategies that are required for classes in all four grades of the high school, and implementing the lessons is required whether or not teachers participated in the Pre-AP program. Similar to the science district, the ELA teachers are expected to share the required Pre-AP lessons with their colleagues during common planning periods.

Administrative oversight and evaluation are also used to promote Pre-AP implementation, although no administrators reported incorporating LTF activities into the state’s new “SMART goals” framework for teacher evaluation. Strategies that administrators reported utilizing include:

* Requiring teachers to bring student work from LTF activities to curriculum meetings.
* Incorporating LTF activities into binders that teachers create for their own evaluations.
* Requiring teachers to maintain a log of LTF activities they have conducted, materials they have obtained from the LTF website, and materials they have shared with colleagues; and requiring teachers to submit this log in advance of each vertical team meeting.
* District-level administrators conducting classroom walkthroughs that include looking for evidence of teachers using LTF activities or strategies, and then following up with principals or department chairs to determine if there’s a reason for observed gaps or to encourage them to discuss observed gaps with teachers.

**Vertical teams and lead teachers.** Almost all teachers and administrators reported advantages and successes of vertical team meetings. They appreciated the opportunity to spend time with their colleagues, meet colleagues from other schools, share resources, and strategize about how to implement LTF activities effectively. One interviewee said, “It allowed us an opportunity to really learn together once we already had the Pre-AP training, so we would go back into particular texts, and it would raise the level of awareness and had us having scholarly conversations.”

Making connections between middle and high school teachers was often mentioned, particularly the benefits of understanding each other’s responsibilities and challenges. The meetings facilitated efforts at vertical alignment, as teachers gained increased knowledge of each other’s required curricular content. Some meetings also aimed to provide specific skills or resources, such as graphing calculator techniques or having an activity at every meeting that required accessing the LTF website.

Illustrating the advantages of working in a vertical team, one English teacher said that the Pre-AP program has enabled pedagogical practices to gain traction in the school, compared to less successful efforts in the past to institute those same practices. She attributes this turnaround to the department-wide nature of the Pre-AP program efforts:

We’ve been trying to get kids to annotate prior to having the training, but the training seems to have gotten it to actually work—where they’re actually annotating for a purpose, and annotating when you don’t tell them to. And I think part of that is that I’m not the only one trying to do it. All the teachers are expecting students to annotate, both directly on photocopied texts and with sticky notes in novels. And the dialectical journal writing, as well; we continue to struggle with how to get to them to write something of value around that, but we’re definitely making progress. And we look at dialectical journals in curriculum meetings, and talk about what information we could provide the kids to help them to go deeper.

Reported challenges of vertical team meetings included time and logistics. Administrators reported that the meetings make for a long day, so attendance can be low, even though a stipend is offered. The distance and travel time between schools, and the fact that the middle and high school days ended at different times, were also logistical obstacles. One district addressed these challenges by holding vertical team meetings during the school day and providing substitute teachers, but one teacher reported that this resulted in teachers being pulled out of the classroom too often. Another district started out having vertical team meetings with middle and high school teachers together, but then separated them because curriculum mapping was taking too long with so many teachers together. This district also reported that it lost its curriculum coordinator, “had too many changes going on at once,” and ended up combining vertical team meetings with curriculum meetings, resulting in reduced focus on Pre-AP implementation and goals. Finally, one teacher reported that some teachers find value in the LTF materials and want to implement them, but they feel like the vertical team meetings are too much and so do not attend.

Lead teachers have primary responsibility for planning and implementing vertical team meetings, and they reported that this duty had been facilitated by the MMSI lead teacher training and the vertical team meeting materials provided by LTF. One administrator felt that MMSI’s strong initial supports had helped the lead teacher subsequently run effective vertical team meetings more independently. Two of the districts had a lead teacher at each participating school, rather than a single lead for the entire district. In one district, this appeared to create some dissatisfaction, because lead teachers from one or two schools were seen as doing most of the work for the entire district.

In addition to the information on vertical team meetings obtained from the teacher and administrator surveys, UMDI observed a vertical team meeting during two of the three site visits. Both vertical team meetings were attended by most Pre-AP trained teachers in the two districts, and almost all teachers appeared to be fully engaged. Activities included presentations by Texas Instruments (the company that creates the graphing calculators used by most districts), sharing of successful and unsuccessful activities that teachers implemented, communication of district expectations regarding LTF implementation, instructions on how to access the LTF website, and implementation of specific LTF lessons. Further details of the vertical team meeting observations are not presented separately in this report, because they overlap with and do not conflict with the findings presented from other sources.

**Training, support, and technical assistance.** Administrators were very pleased with MMSI’s technical assistance. One administrator said, “Anything we have to call about or email about they get us in a heartbeat, so they’ve done a lot for us, which has been great.” Another said, “We are very pleased with the MMSI organization, and Barb Plonski is a major reason that we’re so pleased, because there isn’t anything that we’ve asked her to do—and believe me, we’ve asked for a lot—that she doesn’t drop whatever she’s doing to make sure that she’s there for us.”

Most interviewees also spoke highly of the MMSI summer training and the training facilitators. One teacher said,

The first year of summer training was very much a part of [changing my practices in the classroom]….I actually went up to [our trainer] afterwards and said to her, “You make me want to be a better teacher.” Because she did. The attitude she had and how it was presented, it was very much an exciting way of getting into what the year was.

One English teacher reported,

What I like about Laying the Foundation training is that … they’ll give you one piece, and they show you seven different activities that you can do with it. And as much as you might be exhausted in the training because you’re working on the same piece for so long, it’s really useful to see … that you can take one piece and there’s all this stuff that you can do with it. There are so many layers, and it allows you to peel back the layers individually so that you can take a piece and bridge it over a week, or revisit it and look at it from a lot of different angles. And I think that seeing that shift—that we hold onto a piece for longer—has taught the kids that literature has depth, as opposed to, “We read this story in two days and we’re done.”

Teachers differed with regard to the benefits and challenges of specific aspects of the summer trainings. Whereas several teachers deeply valued the time provided to work through LTF activities, others felt that the time would be better spent discussing the pros and cons of different activities with colleagues. One teacher criticized what she described as being read to all day, reporting that the trainer told the class that NMSI—the National Math and Science Initiative, purveyor of the LTF program—requires the trainers to read every word. Two teachers disliked that the training became more centered on the trainer during the three years of training, and that the amount of time provided to discuss activities with colleagues and prepare activities for classroom use declined commensurately.

When asked about training and technical assistance needs, one teacher suggested a telephone help line for questions about specific LTF labs, as well as a consultant on tailoring labs based on available materials. One teacher believed that there were additional LTF training modules, which she referred to as Modules 13–16, that were unavailable to her. She was irritated about this and wanted access to all of the existing curriculum materials. Last, one teacher said, “It would be nice to have our special education teachers attend the LTF trainings, or at least my inclusion teacher. Because a lot of times I have tried to implement a lesson with my inclusion class, and I’m collaborating with my inclusion teacher on it, but she’s never done it before, because she didn’t attend the trainings.”

Districts’ inability to pay for Pre-AP training for all teachers, as well as teachers leaving the school after being trained, were both reported as challenges. One administrator reported that the Pre-AP program could not be implemented in the school’s 6th grade, because no 6th-grade teachers were trained. An administrator at another school explained that the whole department is trying to make changes based on LTF’s key pedagogies, but only about half the teachers are trained and therefore only half have access to the LTF website. The district was told by MMSI that they are allowed to share LTF activities but not LTF website logon information. Their solution has been to have LTF-trained teachers identify key activities that are then discussed with all teachers. The administrator did report, however, that this disparity in access to a high-quality curriculum resource has created some sense of “haves and have-nots” within the department. One factor that reduced the level of discontent was that all teachers had been given the opportunity to participate in the training, not many signed up, and then the department actively recruited additional teachers. This district has also begun to utilize teachers who have completed all three years of LTF training to teach “literacy institutes” during the summer based on LTF practices for teachers across disciplines. Some of institutes will also be offered during the school year, and teachers who administrators believe need help in particular literacy skills will be pulled out of class to attend.

Finally, one teacher reported that the availability of LTF activities only as PDFs rather than Word documents made it difficult to modify them for differentiation purposes. She ends up simply crossing out parts of the PDF, but she would rather modify them electronically and then print them without cross-outs. In part this was because she did not want some students to see that certain items were crossed out as too difficult for them but not for other students.

**Additional successes.** All interviewed teachers and administrators had favorable to very favorable feedback about the successes of the Pre-AP program. They felt that it was rigorous, raised expectations for both teachers and students, helped teachers understand how to teach AP material effectively, led students to deeper thinking and engagement with high-quality curriculum materials, and raised some students’ confidence level because of the complexity of the material presented. Some teachers noted that LTF activities were well-aligned with the Common Core, which made it easier to teach what they were supposed to teach. The mathematics site reported that the rigorous LTF activities were also helping middle school teachers become more comfortable teaching content that they had not taught previously.

All teachers and administrators believed that the Pre-AP program has been successful in increasing students’ readiness for success in AP courses and exams, as well as general college readiness. They reported that LTF activities had provided scaffolding for them to introduce advanced topics and strategies that would be beneficial whether or not students actually took AP courses and exams. Moreover, they felt that students were feeling more confident about AP courses and exams specifically, because of the encouraging messages and advanced content they were receiving from the Pre-AP program. One teacher said,

It opens a gateway to the AP for students who may not necessarily have thought that AP was a path for them…we’re implying that they’re able to do it, and we also say that these are…the types of approaches you may be taking in AP [courses]. So it allows awareness and understanding, which raises their level of curiosity to go into the AP courses.”

**Additional challenges.** Several challenges related to the Pre-AP program are embedded in the sections above. Interviewees reported the following additional challenges and strategies to address the challenges:

* District curriculum requirements that reduce the time available for LTF activities (e.g., preparation for the MCAS exam, or being required to have four classroom “stations” at which students spent 20 minutes per day). One teacher explained that her curriculum had five required domains, and she was permitted an “off-domain” week for each domain, so she conducted LTF activities during those weeks.
* Some teachers felt that Pre-AP summer training was so intensive, and for multiple years, that it precluded their ability to participate in other professional development that interested them. One solution to this challenge was demonstrated by districts who held Pre-AP training during their district’s official professional development days during the school year. This enabled the district to promote their own training priorities, but also did not commit teachers to three summers of four-day Pre-AP trainings.
* Fee waivers and reimbursements for AP exams have declined, making it difficult for some students to pay for the exams. Two interviewees reported that some students who had completed AP courses declined to participate in AP exams for this reason. An administrator explained that the full cost of AP exams is $86, which an income-based subsidy from the College Board reduces to $53.[[4]](#footnote-4) In the past, subsidies from the federal government have further reduced the cost to $10 per exam, but those subsidies were canceled as part of the federal “sequester” that was implemented in March 2013. The district is seeking private funding to cover the cancelled subsidies.
* Many students lack the academic skills that are assumed for many LTF activities. Most interviewed teachers did not report student academic skills levels as a problem, however, noting that they provided scaffolding and differentiation as needed. One site reported addressing this challenge by teaching a course on lab skills that students were lacking. Student literacy levels were also reported as a challenge for LTF mathematics and science activities (e.g., the ability to comprehend complex instructions for a science lab activity). Moreover, some mathematics and science teachers reportedly lacked the content and/or pedagogical knowledge to teach some of the mathematics required by LTF activities. To address these challenges, one school created literacy and mathematics professional development courses for mathematics and science teachers. These courses provided teachers with ten professional development points toward their re-licensures.

**Sustainability.** Previous sections have described numerous ways that districts have begun to integrate Pre-AP training and teaching into their administrative structures. These strategies include incorporating LTF activities into curriculum meetings and district curriculum frameworks, offering courses to supplement teachers’ preparation for teaching LTF activities, having experienced LTF teachers share their knowledge with colleagues, and considering LTF implementation in teacher evaluations. Many of these activities can be implemented at limited expense.

A greater challenge will be the expense for districts who want to provide the full three years of LTF training to additional teachers who did not participate in the RTTT training cohorts. One administrator said that she definitely planned to continue offering Pre-AP training beyond the RTTT funding period, and she believed that her superintendent was making financial provisions for this. Another administrator proposed a lower-cost train-the-trainer model, where a small number of teachers would receive training from LTF and then carry out in-district trainings. She also suggested sustaining Pre-AP practices in the district by offering professional development “refreshers” to teachers periodically during the school year.

**Classroom Observations**

At each of the three site visits, UMDI observed a teacher implementing an LTF lesson and organized the observation by utilizing LTF’s “Observable Indicators of Effective LTF Teaching” protocol. The instrument provides for rating teachers on twelve dimensions in four domains on a 1–5 scale from “Not observed at all/Not demonstrated at all” to “Observed to a great extent/Demonstrated to a great extent.” While the twelve dimensions and four domains were useful for structuring the three observations, the scale scores seemed less valid due to the lack of standardizing examples based on instrument norms or a wider range of observations. Therefore, the findings are organized according to the four domains: teaching environment, presentation structure, implementation, and subject-specific content and strategies.

These findings provide useful information about the implementation of LTF activities, but it is important to keep in mind that they are based on three days in three classrooms in three districts, and therefore do not represent a sample that is broad or necessarily representative of the many possible subgroupings of teachers and students. In addition, each of the lessons was one day in a multi-day activity, and so not all parts of the teachers’ activities related to the lesson were observable. Last, it was not possible to observe the impacts of the Pre-AP program on teachers’ pedagogical strategies, as teachers were not observed before training occurred. The teacher interviews and surveys conducting her Years 2 and 3 provide more specific information relevant to that question.

The physics lesson was a lab activity in which students needed to determine how the length of time required for a pendulum to make a full back-and-forth swing was affected by the length of the string, the weight of the ball, and the angle of release. The mathematics lesson was a worksheet on linear reflections. The English lesson was a “literature circle” in which students discussed a portion of *Huckleberry Finn* that they had read and annotated.

**Teaching environment.** The three dimensions of this domain are “Encouraged students to generate ideas, questions, conjectures, and or propositions that reflected engagement or exploration with important, subject-related topics,” “Teacher behavior fostered interactions that reflected collaborative working relationships among students,” and “Through conversations, interactions with the teacher, and/or work samples, students showed they were intellectual engaged with ideas relevant to the focus of the lesson.” These dimensions were evident in each classroom. In the English class, students engaged in lively and intellectually complex discussion regarding a writing prompt provided by the teacher, and then with regard to their text annotations. The prompt was available as soon as they entered the classroom, and teacher checked their work while they were responding to the prompt. The physics students had hands-on opportunities with a lab apparatus to discover and reflect together in small groups about the relationships of interest. The environment was subdued, and students were mostly productive and engaged. The teacher circulated among the groups but asked only a limited number of questions to assess and support the students’ understanding. In the mathematics class, these dimensions were present, but less so than in English and physics, because the worksheet reflected practice more than active inquiry. The students sat in pairs but mostly worked independently. As the period progressed, however, some students discussed the questions, supported each other’s work, and explained their reasoning to each other.

**Presentation structure.** The three dimensions of this domain are “The presentation of the material was well-organized and structured,” “The presentation included an inquiry-based approach to important concepts in the subject area and enabled students to construct their own learning,” and “The teacher obtained and implemented resources appropriate for the lesson and displayed an appropriate level of preparedness for teaching.” These dimensions were most evident in the English and physics classrooms. In English, the writing prompt and previously assigned materials were available and well-structured, and the students’ writing and discussions strongly encouraged them to construct their own learning around important concepts. The physics classroom also had appropriate materials and apparatus set up and ready for students, and students worked in small groups to collectively develop important concepts, guided mostly by the LTF materials and to a lesser extent by teacher comments. The worksheet-based activity in the mathematics classroom involved almost no teacher presentation of materials, and the activity was not particularly inquiry-based, as it mostly involved practice of mathematic approaches learned in previous classes. The lack of an inquiry-based approach would presumably not be seen as a negative by the many practitioners who consider skills practice essential. Additional class periods would need to be observed to conclude whether this was a typical approach or whether the teacher’s approach also includes inquiry-based methods. The teacher was utilizing an LTF activity, so it also clear that not all LTF mathematics activities are inquiry-based.

**Implementation.** The three dimensions of this domain are “The teacher’s questioning strategies developed student conceptual understanding of important subject area content,” “The teacher effectively monitored the progress of all students,” and “The teacher’s actions and words reveal flexibility, high levels of energy, self-confidence, and application of LTF’s Belief Statements.”[[5]](#footnote-5) This domain was again most apparent in the English and physics classrooms. The English teacher was particularly energetic, leading a lively classroom discussion and then having students conduct discussions in small groups while she circulated, spending several minutes with each group and engaging actively with students around conceptual issues. The physics teacher was also moderately strong in most of these areas, although less so than the English teacher. She was kind and warm, but not an active intellectual presence, and during about half of the class period she was neither interacting with nor closely observing students. Nonetheless, the students maintained a strong task orientation, carried out the lab activity, and appeared to derive the intended concepts related to the pendulum. The mathematics teacher provided no classroom presentation, and had students engage in the worksheet with very minimal introduction or conclusion. She did conference briefly with individual students, typically for less than a minute per student, but demonstrated a low energy level. She demonstrated adequate confidence, but only in the limited forms of one-on-one interaction in which she engaged.

**Subject-specific content and strategies.** The three dimensions of this final domain are “Teacher explained to students the reason the content and strategies were important to learn,” “Content communicated by direct and non-direct instruction by the teacher was consistent, with a deep knowledge of and fluency with the subject area concepts of the lesson,” and “Appropriate and meaningful connections were made within the discipline or to other disciplines.” These dimensions were the most difficult to assess in the context of observing only a single class period of each teacher’s instruction, and only one day of a multi-day lesson. While none of the teachers explained to students the reason that the content and strategies were important, they may have done so on a different day of the same activity. Similarly, during the inquiry phase of an activity, such as the pendulum lab, writing prompt, or math worksheet, one would not necessarily be able to observe deep teacher content knowledge, communication of that knowledge to students, or connections made among disciplines. None of these dimensions were substantially evident during the classroom observations, but it is difficult to draw conclusions about the teacher’s performance on these dimensions more generally.

**Conclusions.** The three classroom observations summarized above provide a glimpse at the state of implementation of the RTTT Pre-AP program. The teachers’ instructional methods clearly incorporate many elements of LTF’s framework, although to varying degrees across the three teachers and the particular LTF lesson they were conducting on the day of the visit. As noted in the introduction to this section, these classroom snapshots are useful for understanding LTF implementation, while the teacher and administrator interviews and surveys conducted in Years 2 and 3 provide greater insight about the impacts of the LTF teacher training program on classroom instruction.

**ESE Interview**

UMDI interviewed ESE program managers in September 2013 regarding Pre-AP program successes, challenges, and sustainability, as well as recent program developments. Successes reported by the ESE program manager included that more teachers were trained during the summer of 2013 than in the previous two summers combined, and that ESE was able to offer $325,000 of additional training for teachers from Level 2–4 schools. She also reported that districts have provided very positive feedback about the training, 88 districts have trained at least one teacher, some districts have trained high percentages of their teachers, and some districts have integrated Pre-AP materials deeply into their curriculum frameworks.

The greatest reported challenge was that MMSI will no longer be able to utilize the LTF curriculum, as a result of an impasse between MMSI’s parent organization (Massachusetts Insight Education) and the organization that controls the LTF curriculum and trainings (the National Math and Science Initiative, or NMSI). Following this development, MMSI’s two primary Pre-AP program administrators were hired by NMSI and left MMSI. Nonetheless, MMSI wanted to continue to be the Pre-AP program vendor and proposed offering a different curriculum to replace LTF. ESE was concerned that this would be disruptive to teachers and districts that had already worked deeply with LTF and incorporated it into their classrooms and curriculum frameworks, and that were well known and understood by the MMSI personnel who are now working at NMSI. At the time of this report, the ESE program manager believed that districts will have the option to work with an appropriate vendor of their choice. This would enable them either to continuing working with MMSI, or to switch to NMSI and continue working with LTF and the former MMSI personnel who are now at NMSI. ESE noted that it will be important to communicate clearly to districts about these changes and their options.

One challenge was noted in response to UMDI’s observation that MMSI’s technical assistance has been concentrated on a subset of Pre-AP districts that have either reached out to MMSI or responded to MMSI’s outreach, and that some districts haven’t made use of the MMSI technical assistance resources that are included with their Pre-AP participation. UMDI asked if there had been any expectation from ESE that districts would accept a certain amount of support or whether they were free not to make use of that resource if they preferred. ESE’s response was that there had been no such expectation that districts would accept support and mentioned that one district had indicated that it had been a challenge to get MMSI to come to their district to provide support. This district had assumed that MMSI would make greater efforts to be in touch with them. The ESE program manager said that ESE should perhaps be checking in with districts to determine if they are receiving the technical support that they have paid for and may want or need.

UMDI also noted that districts have implemented the Pre-AP program at very different depths and intensities, and asked if there had been any expectations from ESE regarding minimum levels of implementation. The ESE program manager said that the program has always been under local control, so there was not accountability for minimum levels of implementation. She agreed that not all districts are implementing Pre-AP to the same depth and felt that ESE should consider how to support the districts that appear to be less invested or implementing at a lower level. She thought this might be particularly important for Pre-AP districts that are not also participating in MMSI’s AP program.

A final reported challenge was program sustainability. The ESE program manager noted that district funds for professional development are typically limited, but that one large district has expressed interest in beginning to receive Pre-AP training, and that another large district has trained more than 200 teachers without using any RTTT funds. She emphasized that program sustainability depends on whether districts will fund their own Pre-AP work, and that currently there is no clear information available regarding districts’ planned next steps.

**Vendor Interview**

UMDI interviewed MMSI’s Pre-AP program manager in August 2013 regarding Pre-AP program successes, challenges, and plans. With regard to successes, she reported that about six new districts have contacted her to set up trainings, even though they are not RTTT Pre-AP districts. She explained, “It’s basically word-of-mouth is getting out there, which is pretty exciting, and to me, that means we must be doing something right.” She was also pleased that Texas Instruments and Pasco had made technical assistance presentations about technology tools at the vertical team meetings of several districts, and that ESE had made RTTT Goal 4A funds available to some districts to fund purchases of technology tools. She reported that MMSI’s work with ESE was very collaborative and positive, with no changes needed.

As described in the teacher and administrator interview sections above, MMSI has worked with district scope and sequence documents to associate district standards with specific LTF activities. The program manager noted that this embedding needs to vary somewhat across districts, because districts are attempting to implement the Common Core at different paces and in different sequences. MMSI’s work in this area has resulted in fully operational tools in one district, and MMSI intends to disseminate those tools for use and modification by other districts.

MMSI also reported getting more prescriptive with districts about vertical team meetings during Year 3. The program manager provided more specific agendas for districts’ vertical team meetings than in past years, where the focus was intended to be less talking about Pre-AP work and more doing Pre-AP work. The proposed structure was for lead teachers to have looked at the discipline’s scope and sequence before the meeting in order to identify two LTF activities that would complement and support teachers’ work in the upcoming weeks. At the meeting teachers would discuss as a group how to implement those activities, potential problems, and needed scaffolding. Then teachers would conduct the activities in their classrooms, and at the next vertical team meeting bring and discuss student products from the activities and begin the same process again with two more activities. MMSI also posted these meeting agendas and suggestions on the LTF website. The program manager reported that she observed some sites using this structure successfully, but she didn’t know how many districts had actually utilized the structure to support their vertical team meetings.

MMSI also reported some challenges and responded to challenges mentioned by teachers. The program manager agreed with the school personnel mentioned earlier who would prefer to have the LTF materials available as Word documents rather than PDFs. She said that she has requested this change, and that providing only PDFs may reflect an issue of protecting intellectual property. She mentioned that LTF has reduced barriers on another aspect of its intellectual property, by allowing districts that have trained at least half of their teachers in a given discipline to make LTF materials for that discipline available on an internal district website for both LTF-trained and other teachers. The other teachers are not permitted to access the LTF website directly, but their ability to access lessons and assessments can help the district integrate LTF activities into their district curriculum frameworks. MMSI also agreed with teachers about the difficulty of navigating the LTF website: “It is something they’ve been trying to work on. In an ideal world, you should be able to put in a standard and come up with an activity, and it doesn’t [currently] work that way.”

With regard to districts who don’t make use of their technical assistance hours from MMSI, the program manager said that she has contacted these districts and made repeated offers of assistance, but some don’t respond and others say that they don’t need assistance. She also pointed out that MMSI has substantially exceeded its contracted technical assistance hours in some districts, and that the work done in those districts, such as the curriculum mapping work already described, benefits other districts too. Finally, she reported that at least one district was utilizing underqualified teachers to implement Pre-AP activities, such as 6th-grade teachers who are primarily trained in English or social studies. Administrators explained to her that these teachers are grandfathered in as “highly-qualified” teachers at the 6th-grade level but not at higher grade levels. In order to meet district goals for percentage of highly-qualified teachers, administrators are shifting teachers with mathematics licensure to higher grade levels. MMSI explained that they are attempting to provide some targeted technical assistance, but that there are limitations to the extent that such assistance can address a teacher’s lack of preparation.

The MMSI program manager talked about plans for Year 4, although it seems likely that her transition from MMSI to NMSI could alter these plans. She wanted MMSI to continue its main work of training teachers, supporting vertical team meetings, providing needed materials, and advancing the work of associating LTF activities with scope and sequence documents. She reported that some districts have recently given MMSI their data from diagnostic assessments, and MMSI wants to expand their work in suggesting specific LTF activities to these districts that could address standards on which student performance was low. Last, she mentioned that she invited superintendents to the fall 2013 lead teacher training day, with the hope that superintendents could hear “what needs to be done to bolster implementation” and take action accordingly.

**Completion of Pre-AP Teacher Training**

Two measures of Pre-AP program implementation are the number of teachers who completed training and how many years of training they completed. Each year of Pre-AP training is four days long, and ESE considers teachers to be “trained” if they complete three of those four days. To avoid confusion with the different years of the study, ESE refers to the three years of Pre-AP training as parts 1, 2, and 3. The data available from MMSI at the time of this report included all part 1 and part 2 teacher training attendance through the end of the 2012–13 school year, but not the training days that took place during the summer of 2013. “Cohort 1” districts are those that completed their first year of training during the summer of 2011, and “Cohort 2” districts are those that completed their first year of training during the subsequent school year or summer.

The table below summarizes how many teachers in each district and discipline completed part 1, part 2, or both. Interpreting the table requires keeping in mind that, based on the time period shown in the table, Cohort 1 teachers may have completed Parts 1 and 2, whereas most Cohort 2 teachers will have completed only one part.

While it appears that most teachers did not complete a second year of training, it is important to keep in mind that only one year of training is shown for Cohort 2 teachers. Nonetheless, almost all Cohort 1 districts had more teachers complete part 1 than part 2, and the decline was often substantial. Two reasons that teachers complete one part but not the other are that some districts provide only one year of funding for their teachers to attend, and some teachers do not attend a second year despite the opportunity. In addition, many teachers attend only or two days of training and are therefore not counted as completers.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Completion of Pre-AP Teacher Training by District, Discipline, and Training Part** | | | | | | | | | |
|  | **Mathematics** | | | **ELA** | | | **Science** | | |
| **District** | **Part 1** | **Part 2** | **Parts 1 & 2** | **Part 1** | **Part 2** | **Parts 1 & 2** | **Part 1** | **Part 2** | **Parts 1 & 2** |
| Acad. of the Pacific Rim | 7 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 |
| Ashland | 2 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 0 |
| Attleboro | 0 | 0 | 0 | 12 | 12 | 9 | 0 | 0 | 0 |
| Auburn | 5 | 0 | 0 | 7 | 5 | 5 | 0 | 0 | 0 |
| Barnstable | 14 | 0 | 0 | 4 | 0 | 0 | 4 | 0 | 0 |
| Bellingham | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 |
| Berkshire Hills | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 |
| Blackstone Valley RTV | 3 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| Blackstone-Millville | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| Boston | 52 | 15 | 14 | 3 | 0 | 0 | 23 | 12 | 11 |
| Boston Collegiate | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| Brockton | 4 | 4 | 3 | 8 | 5 | 5 | 4 | 0 | 0 |
| Carver | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Central Berkshire | 2 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 |
| Chelsea | 4 | 2 | 2 | 6 | 5 | 3 | 1 | 0 | 0 |
| Chicopee | 59 | 64 | 53 | 0 | 0 | 0 | 0 | 0 | 0 |
| City On A Hill | 2 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 |
| Danvers | 3 | 1 | 1 | 2 | 0 | 0 | 3 | 3 | 3 |
| Dedham | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| Douglas | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| Dracut | 0 | 0 | 0 | 2 | 0 | 0 | 2 | 0 | 0 |
| Dudley-Charlton Reg | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| Easthampton | 4 | 3 | 2 | 5 | 0 | 0 | 1 | 0 | 0 |
| Everett | 17 | 15 | 8 | 26 | 6 | 6 | 0 | 0 | 0 |
| Fairhaven | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Fall River | 0 | 0 | 0 | 28 | 16 | 15 | 0 | 0 | 0 |
| Falmouth | 7 | 0 | 0 | 7 | 0 | 0 | 5 | 0 | 0 |
| Fitchburg | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| Framingham | 8 | 0 | 0 | 0 | 0 | 0 | 6 | 2 | 0 |
| Gardner | 0 | 0 | 0 | 1 | 0 | 0 | 2 | 0 | 0 |
| Holyoke | 0 | 0 | 0 | 64 | 0 | 0 | 1 | 0 | 0 |
| Holyoke Community | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| Lawrence | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lawrence | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Leicester | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Leominster | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ludlow | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 |
| Lunenburg Co | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| Lynn | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Malden | 6 | 0 | 0 | 19 | 9 | 7 | 18 | 9 | 5 |
| Marlborough | 3 | 1 | 1 | 2 | 0 | 0 | 5 | 0 | 0 |
| Mashpee | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| Medway | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| Milford | 3 | 0 | 0 | 3 | 0 | 0 | 3 | 0 | 0 |
| Milton | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| New Bedford | 15 | 0 | 0 | 26 | 0 | 0 | 13 | 0 | 0 |
| North Adams | 3 | 0 | 0 | 4 | 0 | 0 | 3 | 1 | 1 |
| North Brookfield | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Northampton | 4 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| Northbridge | 0 | 1 | 0 | 0 | 0 | 0 | 2 | 0 | 0 |
| Norton | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Palmer | 2 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 |
| Pittsfield | 0 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 0 |
| Plymouth | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Randolph | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 |
| Revere | 3 | 0 | 0 | 2 | 1 | 0 | 4 | 2 | 2 |
| Sabis International | 3 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 |
| Salem | 0 | 0 | 0 | 29 | 49 | 4 | 1 | 0 | 0 |
| Saugus | 7 | 7 | 7 | 7 | 4 | 4 | 7 | 0 | 0 |
| Somerset | 9 | 7 | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| South Hadley | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| South Shore | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 |
| Southbridge | 5 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 0 |
| Southwick-Tolland | 6 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 |
| Springfield | 26 | 0 | 0 | 20 | 33 | 14 | 22 | 0 | 0 |
| Swampscott | 7 | 7 | 6 | 11 | 4 | 2 | 2 | 0 | 0 |
| Uxbridge | 0 | 1 | 0 | 0 | 0 | 0 | 5 | 1 | 1 |
| Wachusett | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| Waltham | 32 | 22 | 21 | 35 | 12 | 11 | 14 | 8 | 7 |
| Wareham | 0 | 2 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| Wellesley | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| West Springfield | 16 | 2 | 2 | 18 | 23 | 14 | 2 | 0 | 0 |
| Whitman-Hanson | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 |
| Whittier RVT | 6 | 0 | 0 | 5 | 0 | 0 | 5 | 0 | 0 |
| Winchendon | 3 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 |
| Worcester | 1 | 0 | 0 | 0 | 0 | 0 | 42 | 0 | 0 |
| **Total** | **388** | **157** | **129** | **403** | **185** | **99** | **238** | **39** | **30** |

**Graduation Rates, Dropout Rates, and MCAS Scores**

A primary objective of the RTTT evaluation is to explore the degree to which changes in key student outcomes are attributable to specific RTTT interventions. As a step in that exploration, UMDI has prepared datasets that summarize trends in average 4- and 5-year graduation rates, annual dropout rates, and MCAS scores for schools that are participating in the Pre-AP program. Those datasets are summarized in the set of tables and figures below.

These summaries are an important step in the outcome evaluation, but they are not presented as evidence that observed changes are attributable to Pre-AP program activities. Rather they are presented to demonstrate the current status and trajectory of UMDI’s quantitative analyses, and to provide interim findings that may be useful to ESE. During Year 4, UMDI will take the next steps with these data to assess the relationship between student outcomes and the Pre-AP and STEM ECHS interventions.

UMDI has also prepared a spreadsheet that lists 4- and 5-year graduation rates for each school and district in the state, and indicates which schools and districts are participating in each of the RTTT programs being evaluated by UMDI. This spreadsheet was submitted to ESE with this report (entitled *Technical Supplement, RTTT C&CR Evaluation 2013, Graduation Rates*) and can be used easily to group graduation rates for RTTT schools and districts by program (Pre-AP, STEM ECHS, and MassCore), and that offers greater flexibility than static tables and figures.

**4- and 5-year graduation rates – Pre-AP districts.** The table and figure below show average 4- and 5-year graduation rates for Pre-AP 4D and non-4D districts. Four-year graduation rates have steadily increased for 4D districts from 72.2% in 2009–10 (the first year of RTTT) to 74.7% in 2011–12. Five-year graduation rates also increased for 4D districts from 75.8% in 2009–10 to 77.8% in 2010–11. Compared to 4D districts, increases for non-4D districts during the same time spans were similar for 5-year graduation rates (1.9 percentage points) but larger for 4-year graduation rates (5.0 percentage points).

**Pre-AP Cohort 1 4D & Non-4D: 4- & 5-year graduation rates**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **4- & 5-Year Graduation Rates for Pre-AP 4D & Non-4D Districts, 2007–08 to 2011–12** | | | | | | | | |
| Year | Number of Students | | 4-Year Graduation Rate | | 5-Year Graduation Rate | | Difference Between 4- and 5-Year Rates | |
| 4D | Non-4D | 4D | Non-4D | 4D | Non-4D | 4D | Non-4D |
| 2007–08 | 19,038 | 12,423 | 69.9% | 73.4% | 74.4% | 76.7% | 4.5% | 3.3% |
| 2008–09 | 18,923 | 12,708 | 70.6% | 73.9% | 74.1% | 77.0% | 3.5% | 3.1% |
| 2009–10 | 18,682 | 12,661 | 72.2% | 73.0% | 75.8% | 76.2% | 3.6% | 3.2% |
| 2010–11 | 17,634 | 12,097 | 73.5% | 74.7% | 77.8% | 78.1% | 4.3% | 3.4% |
| 2011–12 | 17,024 | 12,317 | 74.7% | 78.0% | NA | NA | NA | NA |

| **4- & 5-Year Graduation Rates for Pre-AP 4D & Non-4D Districts, 2007–08 to 2011–12** |
| --- |
|  |

**Annual dropout rates – Pre-AP districts.** The table and figure below show average annual dropout rates for Pre-AP 4D and non-4D districts. Average annual dropout rates have decreased for 4D districts from 4.6% in 2009–10 (the first year of RTTT) to 4.3% in 2011–12. Average annual dropout rates have also decreased for non-4D districts, from 4.6% in 2009–10 to 3.9% in 2011–12.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Annual Dropout Rates for Pre-AP 4D & Non-4D Districts, 2007–08 to 2011–12** | | | | | | |
| Year | Total HS Enrollment | | Number of Dropouts | | Annual Dropout Rate | |
| 4D | Non-4D | 4D | Non-4D | 4D | Non-4D |
| 2007–08 | 70,016 | 46,995 | 4,026 | 2,514 | 5.8% | 5.3% |
| 2008–09 | 68,676 | 46,587 | 3,527 | 2,159 | 5.1% | 4.6% |
| 2009–10 | 67,882 | 46,042 | 3,115 | 2,140 | 4.6% | 4.6% |
| 2010–11 | 66,963 | 45,602 | 2,965 | 2,138 | 4.4% | 4.7% |
| 2011–12 | 64,416 | 45,986 | 2,743 | 1,807 | 4.3% | 3.9% |

| **Annual Dropout Rates for Pre-AP 4D & Non-4D Districts, 2007–08 to 2011–12** |
| --- |
|  |

**MCAS composite performance index (CPI) and achievement gaps – Pre-AP districts.** The table and the three figures below show the average CPI on the 10th-grade English MCAS[[6]](#footnote-6) for students in Pre-AP districts from 2009–10 to 2011–12 for subgroups of interest. As shown, the CPI for nearly all subgroups has increased from 2009–10 to 2011–12. The range of average scores is broad, with a minimum of 60.0 for “Native Hawaiian/Pacific Islander” students in 2009–10, and a maximum of 98.8 for “not high needs”[[7]](#footnote-7) students in 2011–12.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **English MCAS Composite Performance Index (CPI) for Pre-AP Districts, 2009–10 to 2011–12** | | | | |
| Subgroup | Avg. CPI 2009–10 | Avg. CPI 2010–11 | | Avg. CPI 2011–12 |
| Female | 89.7 | 91.7 | | 93.9 |
| Male | 85.3 | 87.3 | | 91.2 |
| White | 91.7 | 93.8 | | 95.6 |
| Asian | 91.7 | 92.0 | | 95.0 |
| Black/African American | 81.9 | 84.4 | | 89.5 |
| Hispanic/Latino | 80.9 | 82.9 | | 87.8 |
| Multi-Race, Non-Hispanic/Latino | 86.4 | 91.4 | | 91.9 |
| American Indian/Alaskan Native | 85.9 | 88.0 | | 90.4 |
| Native Hawaiian/Pacific Islander | 60.0 | 88.0 | | 86.1 |
| Children without Disabilities | 91.4 | 93.6 | | 95.6 |
| Children with Disabilities | 68.3 | 71.0 | | 78.7 |
| Neither LEP nor FLEP | 89.7 | 92.0 | | 94.7 |
| LEP or FLEP | 65.2 | 67.7 | | 77.0 |
| Not Low Income | 93.0 | 94.6 | | 96.2 |
| Low Income | 82.0 | 84.7 | | 89.4 |
| Not High Needs | \* | 98.0 | | 98.8 |
| High Needs | \* | 83.7 | | 88.6 |
| \*ESE began calculating high needs indicator in 2010–11. | | |
|  | | |

| **Average CPI in English for Pre-AP Districts by Gender, 2009–10 to 2011–12** |
| --- |
|  |

| **Average CPI in English for Pre-AP Districts by Student Needs, 2009–10 to 2011–12** |
| --- |
|  |

| **Average CPI in English for Pre-AP Districts by Race/Ethnicity, 2009–10 to 2011–12** |
| --- |
|  |

One of the evaluation questions asks how various subgroups of students perform on measures of student achievement, and if gaps are narrowing. The table and figure below show achievement gaps from 2009–10 through 2011–12. The gaps are defined as between reference groups (i.e., a subgroup of students that typically scores higher than students in a comparison group on the MCAS) and the comparison group(s). The table indicates that achievement gaps have narrowed for all subgroups, while average CPI has improved for all subgroups. Future analyses will further explore trends and changes in achievement gaps in all three MCAS disciplines for subgroups of interest.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **English MCAS Composite Performance Index (CPI) Gap for Pre-AP Districts, 2009–10 to 2011–12** | | | | | | |
| Subgroup | CPI Gap 2009–10 | CPI Gap 2010–11 | CPI Gap 2011–12 | CPI Gap Change 2009–10 to 2011–12 | | Percent Change in CPI Gap 2009–10 to 2011–12 (%) |
| Female | - | - | - | - | | - |
| Male | 4.4 | 4.4 | 2.7 | -1.7 | | -38.6 |
| White | - | - | - | - | | - |
| Asian | 0.0 | 1.8 | 0.6 | 0.6 | | - |
| Black/African American | 9.8 | 9.4 | 6.1 | -3.7 | | -37.8 |
| Hispanic/Latino | 10.8 | 10.9 | 7.8 | -3.0 | | -27.8 |
| Multi-Race, Non-Hispanic/Latino | 5.3 | 2.4 | 3.7 | -1.6 | | -30.2 |
| American Indian/Alaskan Native | 5.8 | 5.8 | 5.2 | -0.6 | | -10.3 |
| Native Hawaiian/Pacific Islander | 31.7 | 5.8 | 9.5 | -22.2 | | -70.0 |
| Children without Disabilities | - | - | - | - | | - |
| Children with Disabilities | 23.1 | 22.6 | 16.9 | -6.2 | | -26.8 |
| Neither LEP nor FLEP | - | - | - | - | | - |
| LEP or FLEP | 24.5 | 24.3 | 17.7 | -6.8 | | -27.8 |
| Not Low Income | - | - | - | - | | - |
| Low Income | 11.0 | 9.9 | 6.8 | -4.2 | | -38.2 |
| Not High Needs | \* | - | - | - | | - |
| High Needs | \* | 14.3 | 10.2 | - | | - |
| \*ESE began calculating high need indicator in 2010–11. | | | | |

## Strategic Considerations

* **Clarification of NMSI’s policies regarding access to LTF materials by school personnel who have not received Pre-AP training could help some districts promote broader implementation of Pre-AP strategies.** While some level of access is apparently permitted, different administrators and teachers within and across districts seem to have different understandings of NMSI’s policies.
* **Some districts have proposed and/or begun to implement approaches to Pre-AP training that could improve program sustainability after the RTTT funding period.** Some districts may continue to pay for the full 12 days of LTF training, but limited professional development funds make this unlikely for many districts. As detailed in the report, some districts have begun to utilize Pre-AP trained teachers to offer informal sharing and formal professional development of other teachers. Other districts proposed various configurations of securing briefer and less expensive trainings provided by NMSI, and it could be beneficial to explore with NMSI options for such alternative trainings.
* **Additional support from ESE and the vendor may increase Pre-AP program implementation by districts that appear to be implementing it less intensively.** Some districts have accepted minimal technical assistance from MMSI and less is known about their implementation of the Pre-AP program. Greater outreach to and support of these districts in the final year of RTTT funding may provide a needed catalyst for higher levels of program implementation.
* **Without adequate fee waivers, some students will opt out of taking AP exams.** Some districts reported attempting to secure district or private funding in response to cancellations of exam subsidies as part of the federal budget sequestration that occurred during the 2012–13 school year.
* **In larger districts, efficiencies can be realized by assigning the lead teacher role to a district-level curriculum specialist rather than a classroom teacher.** Some districts are already utilizing this model, and it permits the lead teacher to share knowledge and resources more readily across schools, to delve more deeply in LTF materials, to support teacher implementation by modeling specific lessons and technology tools in classrooms, and by taking on other program implementation tasks for which a classroom teacher lacks adequate schedule flexibility and time.

# STEM-focused Early College High Schools

## Background

Six districts were chosen in a competitive process to receive RTTT Goal 4E funds to open STEM early college high schools. To date, these six sites have been the focus of UMDI’s evaluation of the STEM ECHSs. Eight additional STEM ECHS sites are being established with the support of discretionary RTTT funds. ESE has requested that UMDI continue focus evaluation efforts on the six sites receiving Goal 4E funds, and continue to postpone evaluation of the other eight sites until their work has progressed further.

**Process Evaluation Questions**

1. In what ways have grantees developed and implemented STEM ECHS components? What are the major challenges to and facilitators of successful program implementation encountered by grantees? What midcourse corrections and attempts to overcome challenges have been undertaken? What additional steps are planned?
2. In what ways has ESE implemented the STEM ECHS program components described in their RTTT grant application? What are the major challenges to and facilitators of program support and facilitation encountered by ESE? How have challenges been overcome and midcourse corrections undertaken? What additional steps are planned?
3. How do STEM ECHS teachers and administrators rate and explain the quality, relevance, and effectiveness of major program components and services?
4. What infrastructure, systems, and processes were put in place to aid STEM ECHS sustainability during and beyond the grant period? What are the greatest challenges and barriers to creating sustainability?

**Outcome Evaluation Questions**

1. To what extent are STEM ECHS students achieving improved outcomes in college and career readiness indicators including measures of academic achievement (e.g., MCAS), graduation, and accumulation of high school and college credits?
2. Do observed changes in STEM ECHS students differ across student characteristics such as gender, race/ethnicity, free/reduced lunch status, ELL status, and special education status? Is there evidence that gaps are narrowing? Are program services reaching students who are at the greatest risk?
3. To what extent are observed changes in student outcomes attributable to STEM ECHS activities versus other RTTT program activities and/or measurable contextual variables?
4. What are the major differences in STEM ECHS implementation and contextual variables across schools whose levels of improvement on student outcomes differ substantially?
5. What is the relationship between level of STEM ECHS program implementation and achievement of targeted student outcomes?

## Methods

This report includes information collected from the following data sources:

* *Interviews.* Phone interviews were conducted in July 2013 with the technical assistance vendor, Jobs for the Future (JFF; see protocol in Appendix J) and an IHE partner (see protocol in Appendix H). An in-person interview was conducted with ESE program managers in September 2013.

**Findings**

**Successes**

UMDI interviewed ESE’s STEM ECHS program manager and two representatives from JFF. ESE and JFF agreed that the STEM ECHSs are in various stages of program development and have experienced varying degrees of success. Successes reported by ESE and JFF are congruent with those reported by sites, which were summarized in the June interim evaluation report. Successes at STEM ECHS sites reported by ESE and JFF include:

* The STEM ECHSs are operational.
* STEM ECHS students are engaging with STEM content.
* Most sites are facilitating college experiences for students.
* Most sites have at least moderate support from school and district leaders.
* Most sites are building strong partnerships with their partnering IHEs.
* STEM ECHS sites and their IHE partners are planning for sustainability.

Further description of these successes can be found in UMDI’s June briefing.

ESE and JFF identified three factors contributing to the success of the STEM ECHS sites. These factors include:

* **Teamwork.** ESE and JFF said that teamwork was a common feature of sites that have had the most success with the STEM ECHS initiative. A JFF representative said, “If someone were to ask me what are the correlates wrapped around successful [STEM ECHS] initiatives … one of them is having an active, successful, well-planned team. The extent that the different sites have been able to pull that together and actually have that be a priority for them, [they have] seen really positive results.”
* **Continuity.** ESE and JFF agreed that sites experiencing the most success have generally maintained the same personnel over time, particularly those in key STEM ECHS leadership positions.
* **Strong support from high-level leadership.** ESE and JFF also agreed that the most successful STEM ECHS sites have had (and continue to cultivate) support from high-level school and district administrators. ESE and JFF both noted that the support of district leaders is critical to the short-term success and long-term viability of the STEM ECHS initiative.

**Challenges**

ESE and JFF shared similar views on the challenges faced by the STEM ECHS sites. They agreed that the degree to which these challenges have been successfully managed has determined, in large part, the relative success of each STEM ECHS.Common challenges identified by ESE and JFF include:

* **Sustainability.** ESE and JFF both said sustainability is a central challenge and an ongoing concern for the STEM ECHS sites. The sites’ concerns regarding sustainability informed ESE’s request to JFF to focus the limited technical assistance that will be provided to sites during Year 4 on exploring strategies for sustainability.
* **Continuity.** ESE and JFF both said that staff turnover has been detrimental to the development of several STEM ECHSs. In one district, there have been 3 superintendents, 4 principals, 3 initiative leaders, and several changes in key counseling staff in the last four years. Turnover at other sites has been less extreme, but in nearly all cases has impeded the development of the STEM ECHSs. JFF summarized this challenge by saying,

There’s been so little continuity and so much turmoil in a number of places that, in a sense, what [we] have had to do is re-do the organization and the team a number of times…. It’s been tragic, you know—it’s so characteristic of districts like the ones we’re working with…. The lack of continuity is just a real challenge. I think that even if you know it intellectually that there’ll be some [staff turnover], I don’t think [sites] anticipated such key shifts in leadership of the initiative or leadership of the school, or in some cases, leadership of the district. And so, there was re-work. I mean, I remember conversations and thinking in my head, “Oh my gosh, we’ve had this conversation twice already.” To me, it’s like, “Didn’t we cover this?” The risk factor of continuity [was] certainly underestimated.

JFF said that most sites failed to sufficiently identify staff turnover as a potential risk, and to establish sufficient administrative structures to support staffing transitions.

* **Academic readiness.** ESE and JFF agreed that many STEM ECHS students do not have the academic skills or background necessary to fully participate in the originally planned STEM ECHS activities, especially college-level coursework. ESE and JFF agreed that, in general, more work needs to be done at earlier stages of academic development to prepare STEM ECHS students for rigorous coursework.
* **Capacity.** JFF suggested that some sites have struggled to muster and maintain the organizational capacity necessary to successfully implement a STEM ECHS. A representative from JFF said,

The difference becomes: what is the capacity on the ground....of a team to focus on this, latch on to it, and figure it out and make it work? More and more, the capacity is huge. [Some sites] did very well with that. They have really smart people. They have a really united team. They have used the strategies. That doesn’t mean they did everything perfect, but they have built their own internal capacity. With other sites, [that capacity is severely lacking]. I think it’s a very common phenomenon. The difference is in both the coach-ability and in the capacity for building their own capacity. So, I don’t think these schools are unique in not having those skills. I mean, why would they [have those skills]? They’re not taught those skills in any graduate course or any undergraduate course. They just aren’t.

JFF listed a number of challenges related to organizational capacity faced by some sites, including a general lack of knowledge related to best practices for program development, insufficient staffing or resources, and insufficient capacity to facilitate needed training or technical assistance.

* **Lack of focus on curriculum and instruction.** JFF noted that across sites there has been insufficient focus on shaping the curriculum and instruction offered though the STEM ECHS:

There’s a big gap in all of this. There has been [little] work actually on “What does instruction in a school that is preparing some or all students to be ready for college work look like that is different from [what the school is already doing]?” We all know that instruction varies greatly in terms of quality and effectiveness, and there has really been, with the exception of just one afternoon [technical assistance] session, no real focus on instruction…. If we’re really serious about a STEM school being more than just a pathway, but actually success in a pathway, which is a different outcome than just having kids in a pathway taking courses, then I think that the focus on… instruction probably would be a great investment…. I know they say they do that, and good instruction for STEM is just good instruction, but it isn’t really happening on the ground. They’re probably not really forced to do that. So that would just be a place that I would say is a fairly obvious gap in this work.

**IHE Partner Interview**

UMDI conducted one additional IHE partner interview with a representative from Quinsigamond Community College (QCC). QCC serves as the IHE partner for the Worcester Public Schools and Quaboag Regional School District. QCC’s representative noted that both partnerships were progressing, and that QCC was working on internal plans for staffing and supporting partnerships with STEM ECHS sites over time. QCC emphasized that they have worked with both of their STEM ECHS partners to address the challenge of increasing students’ academic readiness. Other findings from this interview mirror those from the June evaluation briefing.

**Technical Assistance**

During the past year, JFF has provided a wide range of supports to the STEM ECHS sites. JFF described their role as including on-the-ground technical assistance, facilitation, coaching, planning support, participation in advisory meetings, engaging school and district leaders, and supporting the development of key program policies (e.g., communication plans, student support plans). JFF said that this support occurred during regular site visits and phone meetings. ESE said that JFF’s primary consultant provided good value to the sites. ESE said, “Janice was tough, and excellent. Her toughness helped districts hear what they needed to hear.”

**Next Steps – Sustainability**

ESE and JFF said that the resources dedicated to providing STEM ECHS sites with technical assistance will decrease during Year 4. They have agreed that the focus of JFF’s technical assistance will shift from providing on-the-ground support to supporting districts’ efforts to explore, develop, and implement plans for sustainability. To facilitate this shift, JFF has agreed that Janice Davis, the JFF consultant who has served as the primary technical assistance contact for districts, will no longer serve in that capacity, and that a new consultant will begin working with sites to explore options for sustainability.

ESE indicated that due to limited resources, they do not plan to contribute financial resources to the STEM ECHS sites after the RTTT funding period ends. The ESE program manager said that there is no champion in the state legislature for the STEM ECHS initiative, and that funding for dual-enrollment programs across the state is very limited. ESE said that partnering IHEs have been very generous in supporting districts’ efforts to establish opportunities for STEM ECHS students to take college courses. ESE suggested that districts should continue working internally to find solutions for sustainability, and to look beyond their districts (e.g., Perkins funding) for support.

ESE also indicated that they plan to work closely during the 2013–14 school year with districts that are struggling to implement their STEM ECHS. One of ESE’s goals for these sites is to determine how to leave an “RTTT legacy” after the grant ends.

JFF representatives suggested that a first step in promoting the sustainability of the STEM ECHSs may be to encourage sites to reflect on investments that they have already made in the STEM ECHS, and what impact those investments have had. A JFF representative said,

[The sites need] to back way up in my mind, and they’ve got to figure this out… somebody needs to do some data collection…. They wouldn’t think of it in this way, but it really is a return on investment kind of thing. And they don’t think in those terms…. The sites could say, “Okay, let’s take the strings off all our money and see what we’ve got [and what we can do], and let’s just do.” I’m sure there are some tools people use to do this. But let’s just do an analysis and see where there’s opportunity or overlap.

JFF suggested that a second step in promoting sustainability would be for each district to look beyond the STEM ECHS to determine if and how other resources available to the district could be re-purposed to support the work of the STEM ECHS. A JFF representative said, “Somebody really needs to do an analysis in the district of what they have, what’s working, what’s returning [investment], and what can be eliminated to re-purpose dollars.” She emphasized that such analyses are very difficult for most districts to accomplish and require strong leadership from top administrators.

JFF said that another viable strategy for promoting the sustainability of the STEM ECHS sites may be to identify a “champion” for the initiative, either within a district or across districts, who is willing to represent and promote the work of the STEM ECHS(s). Other low- or no-cost strategies suggested by JFF for promoting sustainability include:

* Leveraging the mathematics and science instructional leaders within ESE to see what additional assistance or technical support could be martialed to strengthen existing programs.
* Forming a supportive and collaborative network of STEM ECHSs for the purpose of sharing information and resources.
* Raising the profile of STEM ECHS programs by publicizing program goals and impacts.
* Increasing efforts to reach out to potential local and regional business partners.
* Gathering evidence of program impact.

# MassCore Policy and Implementation

**Background**

The Massachusetts High School Program of Studies (MassCore) recommends a set of courses and other learning opportunities that Massachusetts students should complete before graduating from high school, in order to arrive at college or the workplace well-prepared and without the need for remedial coursework. The 155 districts that selected the RTTT college and career readiness goal committed to implementing strategies to increase the percentage of their students who complete the MassCore curriculum.

The state’s RTTT goal is to increase the statewide MassCore completion rate from its baseline of 70% of the Class of 2010 graduates to 85% of the Class of 2014 graduates. The state has created a goal for each district, using a formula based on the district’s reported 2010 MassCore completion rate (calculated from the MassCore element of the state’s SIMS database), the district’s number of 2010 graduates, and the total number of graduates statewide needed to bridge the gap between the 70% baseline and the 85% goal. Each district was also expected to determine areas in which courses or supports needed to be expanded in order to meet the 2014 targets, and to create and implement a plan to improve the accuracy of their reporting of MassCore completion levels.

The evaluation questions specific to the MassCore evaluation are listed below.

**Process Evaluation Questions**

1. What steps have districts taken to facilitate MassCore completion by students? What are the major challenges to and facilitators of district implementation and student completion of a rigorous course of study in general, and the MassCore curriculum in particular? What midcourse corrections and attempts to overcome challenges have been undertaken? What additional steps are planned?
2. In what ways has ESE taken the steps to increase MassCore completion as described in their RTTT grant application? What are the major challenges to and facilitators of district support encountered by ESE? How have challenges been overcome and midcourse corrections undertaken? What additional steps are planned?
3. How do district stakeholders explain the relevance of MassCore completion to their efforts at promoting college and career readiness, as well as the effectiveness of their efforts toward fostering greater MassCore completion?
4. What infrastructure, systems, and processes were put in place to aid sustainability of improvements in MassCore completion during and beyond the grant period? What supports could ESE or other partners provide to districts to increase levels of MassCore completion? What are the greatest challenges and barriers to creating sustainability?

**Outcome Evaluation Questions**

1. To what extent are high school graduates achieving increased MassCore completion?
2. At the school and district levels, do observed changes in MassCore completion differ across student characteristics such as gender, race/ethnicity, free/reduced lunch status, ELL status, and special education status? Is there evidence that gaps are narrowing?
3. To what extent are changes in student MassCore completion attributable to state and district efforts in service of this goal versus other RTTT program activities and/or measurable contextual variables?
4. What are the major differences in MassCore completion and contextual variables across schools and districts whose levels of improvement on student outcomes differ substantially?

**Methods**

This section includes information collected from the following data sources:

* *ESE documents and databases.* The state’s SIMS database was used to calculate MassCore completion rates by district. ESE also provided districts’ responses to the MassCore section of the RTTT Years 2–4 Request for Funding.

**Findings**

**MassCore Completion Rates**

One of ESE’s RTTT delivery goals is to increase the statewide MassCore completion rate from its baseline of 70% for the class of 2010 graduates to 85% of the Class of 2014 graduates. To assess progress toward this goal, UMDI calculated the overall MassCore completion percentage for the state, as well as the percentage of graduates in each district who completed MassCore.

The table below shows that rates of MassCore completion for the state have decreased slightly, from 69.6% for 2009–10 graduates (the year before RTTT began) to 68.3% for 2011–12 graduates, and have declined each year since 2008–09.

| **Statewide MassCore Completion Rates, 2008–09 to 2011–12** | | | |
| --- | --- | --- | --- |
| **Year** | **# of Graduates Completing MassCore** | **Total Number of Graduates** | **% of Graduates**  **Completing MassCore** |
| 2008–09 | 47,960 | 66,288 | 72.4% |
| 2009–10 | 45,434 | 65,259 | 69.6% |
| 2010–11 | 44,810 | 64,860 | 69.1% |
| 2011–12 | 44,608 | 65,298 | 68.3% |

While this trend is in the opposite direction of the state’s goals, additional investigation is required to determine whether the trend reflects reporting error rather than an actual decline in MassCore completion rates. This is because, as discussed in previous UMDI evaluation reports, there is strong evidence of substantial inaccuracy in district reporting of MassCore completion rates. Moreover, changes in district reporting procedures could cause large changes in reported MassCore completion rates over time without any underlying change in actual completion rates.

In an attempt to understand how district reporting might influence the observed decline in statewide MassCore completion rates, UMDI calculated[[8]](#footnote-8) and then examined MassCore completion rates for each district for the four school years from 2008–09 to 2011–12. (The resulting spreadsheet was submitted to ESE along with this report, entitled *Technical Supplement, RTTT C&CR Evaluation 2013, MassCore Completion Rates*.) Patterns in completion rates by district were sought that are likely and unlikely, as well as common and uncommon, with the intention of identifying groups of districts that may either serve as models for other districts or benefit from technical assistance and/or clarification of MassCore completion and reporting requirements.

Districts were excluded that had missing or non-existent MassCore completion rates for one or more years, or that had fewer than 20 graduates in one or more years. Each remaining district was coded according to the following trends observed in their MassCore completion rates:

* *Primary trend codes.*
* *All 100%*. District reported 100% MassCore completion all four years.
* *Consistently high.* Greater than or equal to 80% each year, but not all 100%.
* *Consistently moderate.* Between 50% and 80% each year.
* *Consistently low.* Less than or equal to 50% each year, but not all 0%.
* *All 0%.* Zero percent each year.
* *Secondary trend codes.* Districts that did not meet the criteria for a primary trend code or an exclusion code received one of the following codes:
* *Steady increase.* Rate increased at least twice, and never decreased.
* *Steady decrease.* Rate decreased at least twice, and never increased.
* *Major jump up.* Rate increased 30% or more in a single year.
* *Major jump down.* Rate decreased 30% or more in a single year.
* *Spike up.* Rate increased 30% or more in a single year, and then decreased 30% or more in a subsequent year.
* *Spike down.* Rate decreased 30% or more in a single year, and then increased 30% or more in a subsequent year.
* *Multiple spikes.* In three consecutive years, rates increased, then decreased, then increased again; or decreased, then increased, then decreased again. Each change was at least 30%.
* *Uncoded.* No other primary or secondary trend codes were applicable.

The table below summarizes trends in rates of MassCore completion for each district in the state from 2008–09 to 2011–12.

| **MassCore Completion Rate Trends by District, 2008–09 to 2011–12** | | |
| --- | --- | --- |
| Trend Description | Number of Districts | Percent of Districts |
| All 100% | 68 | 21.9% |
| Consistently high (≥80%) | 65 | 20.9% |
| Consistently moderate (≥ 50% and ≤ 80%) | 10 | 3.2% |
| Consistently low (≤50%) | 23 | 7.4% |
| All 0% | 2 | 0.6% |
| Steady increase | 12 | 3.9% |
| Steady decrease | 5 | 1.6% |
| Major jump up | 16 | 5.1% |
| Major jump down | 32 | 10.3% |
| Spike up | 5 | 1.6% |
| Spike down | 9 | 2.9% |
| Multiple spikes | 2 | 0.6% |
| Uncoded (no defined trend) | 22 | 7.1% |
| Missing data (excluded) | 26 | 8.4% |
| Not enough students (excluded) | 14 | 4.5% |
| Total | 311 | 100.0% |

These data suggest that some districts have adjusted their MassCore reporting practices over time, and these changes could obscure actual increases or decreases in the states’ overall MassCore completion rate. Variations in patterns of MassCore completion are explored in further detail below.

While the state’s rate of MassCore completion has changed by only four percentage points during the four-year period examined, completion rates of many districts have varied widely during the same time period. About half of all districts (54.0%) reported relatively stable levels of MassCore completion (i.e., those coded as all 100%, consistently high, consistently moderate, consistently low, or all 0%). However, about one out of five districts (20.6%) reported highly variable rates (i.e., those coded as major jump up, major jump down, spike up, spike down, or multiple spikes).

Twice as many districts had a major jump down (10.3%) as those that had a major jump up (5.1%). Major jumps are particularly interesting because they may signal substantial changes in MassCore-related policies and procedures in these districts, or possibly in a subset of schools within these districts. To understand changes in the statewide MassCore completion rate, it seems particularly important to learn more about MassCore policies, reporting practices, and relevant contextual factors in these districts.

The number of districts reporting major spikes (up, down, or multiple) was relatively small (5.1%). These trends seem to signal significant shifts in MassCore-related policies and/or reporting practices in these districts. Districts that have reported one or more spikes may benefit from technical assistance regarding MassCore reporting.

Twelve districts (3.9%) had a steady increase, and 6 additional districts (1.9%) whose primary trend code was consistently high, consistently moderate, or consistently low could also have been coded as steadily increasing. These represent a core of potentially model districts that are taking actions that result in gradual improvement. Conversely, five districts (1.6%) had a steady decrease, and five additional districts whose primary trend code was consistently high, consistently moderate, or consistently low could also have been coded as steadily decreasing. This group may also benefit from technical assistance to reverse their steady decline.

Sixty-eight districts (21.9%) reported that 100% of their graduates completed MassCore for each of the four years included in this analysis, and an additional 65 districts (20.9%) reported consistently high rates of MassCore completion. In ESE’s efforts to promote improved MassCore reporting practices and higher rates of MassCore completion, this group of districts may serve as one source of models. For example, districts that consistently report 100% completion may share common policies, such as graduation requirements that meet or exceed MassCore requirements. A clear understanding of the policy environment that exists in these districts could inform the broader conversation about MassCore.

Finally, 23 districts (7.4%) reported consistently low rates of MassCore completion, and only 2 districts (0.6%) reported 0% MassCore completion for all years included in this analysis. These districts clearly have not adopted MassCore as a graduation requirement. If ESE wanted to know more about policy, reporting, and logistical challenges related to incorporating MassCore as a standard graduation requirement, these districts may offer valuable insights.

**District Needs Assessments and Action Plans**

Each RTTT-funded district was required to submit a continuation funding report for years 2–4 of the grant. As a part of this submission, each district was asked to write a brief needs assessment identifying current course-taking and other gaps in their district that may account for lower levels of MassCore completion. Districts were also asked to identify possible initial solutions to increase MassCore completion rates. This included determining areas in which courses or supports needed to be expanded in order to meet the 2014 targets, and to create and implement a plan to improve the accuracy of their reporting of MassCore completion levels.

In response to this request, 132 districts provided brief statements ranging from a single sentence to 3 paragraphs. Twenty-nine districts mentioned successes related to MassCore completion. The most common success cited by districts was that local graduation requirements had already been aligned to MassCore, so 100% of their graduates had completed MassCore. A few districts reported year-to-year improvements in their MassCore completion rates.

Twenty-eight districts described challenges related to MassCore completion that included the following: district graduation requirements were not aligned with MassCore, particularly in the areas of mathematics, foreign language, art, and physical education; many high needs and at-risk students lacked foundational skills necessary to complete MassCore; the district lacked needed staffing and/or curricular materials; and logistical challenges prevented students from completing all MassCore course requirements.

Ninety-nine districts described their ongoing and planned strategies for improving MassCore completion rates. Strategies included:

* Adjusting graduation requirements to align with MassCore requirements. Several districts reported that they did not yet require 4 years of math, 1 year of art, 2 years of foreign language, and/or physical education opportunities that were aligned with MassCore requirements. Some districts said that they had already increased the total number of credits required for graduation to align with MassCore expectations.
* Modifying course sequencing to remove obstacles that limit opportunities for students to complete MassCore.
* Developing and/or offering additional courses to create opportunities for every student to complete MassCore requirements, and adjusting staffing models (e.g., hiring staff) to cover those courses.
* Modifying the K-12 scope and sequence to include appropriate pathways to MassCore completion for all students.
* Performing a needs assessment to determine why some students were not meeting MassCore requirements, determine which groups of students were least likely to complete MassCore, and identify course modifications and/or materials needed in each content area to increase the number of graduates fulfilling MassCore requirements. A review of student transcripts was mentioned as an important step in this process.
* Providing professional development to administrators, counselors, and teachers to raise awareness of MassCore requirements.
* Having counseling staff monitor students’ progress toward MassCore completion, and adjusting students’ course selections to align with MassCore requirements as necessary.
* Establishing or enhancing community partnerships to build course offerings and support.
* In smaller districts, establishing collaborative relationships with neighboring districts to expand course offerings so that all students have the opportunity to complete MassCore requirements.
* Creating a district team to review needs assessment data and develop an action plan for increasing MassCore completion rates.
* Integrating Common Core alignment efforts (e.g., course development and sequencing) with MassCore completion goals.

Districts reported that their RTTT funds earmarked for MassCore would be used to enhance staffing in key subject areas; provide profession development to teachers, counselors, and administrators regarding MassCore requirements; purchase needed course materials; enhance communications with students and family members regarding MassCore requirements; develop curriculum for new courses; and provide stipends for teachers to meet and review course pathways.

**Strategic Considerations**

The findings presented regarding districts’ patterns of MassCore completion rates over time suggest three strategic considerations related to these patterns:

* **Validity of the MassCore reporting element may be increased by working with districts that have unlikely patterns of MassCore completion.**
* **Districts that have similar and low or decreasing patterns of MassCore completion may benefit from common interventions that could increase their completion rates.**
* **Districts that have similar and high or increasing patterns of MassCore completion may serve as models that could help other districts improve.**

One additional strategic consideration is offered that is unrelated to the completion rate patterns:

* **It appears that ESE uses slightly different criteria to identify graduates for MassCore calculations than to identify graduates for graduation rate calculations.** If so, applying the same criteria for both calculations could increase their concordance and simplify the interpretation of relevant comparisons.

# Appendices

1. This takes into account six Malden teachers who completed two days of training in 2010. [↑](#footnote-ref-1)
2. During the 2011-12 school year, MAVA participants were selected from seven schools. Entries in the tables represent the weighted average of all students from these schools as reported in the June 2012 SIMS database. [↑](#footnote-ref-2)
3. “Project 4D All” is a weighted average of Cohort 1 and Cohort 2, so it will always fall between them. [↑](#footnote-ref-3)
4. Independent confirmation suggests that the $53 figure comes from an $89 initial fee, minus a $28 College Board subsidy, minus an $8 administration fee that the district voluntarily foregoes. [↑](#footnote-ref-4)
5. LTF’s Belief Statements:

   * Accomplished, dynamic teachers are knowledgeable in their content and confident in their abilities to prepare students for higher education. They create classrooms in which: students engage intellectually to develop conceptual understanding; generate their own ideas, questions, and propositions; interact collegially with one another to solve problems; and employ appropriate resources for inquiry-based learning.
   * LTF’s teacher training program offers meaningful support to teachers as they construct these effective classrooms. Through tested content materials and research-based instructional strategies, LTF enables and encourages them to: choose significant and worthwhile content and connect it to other knowledge, use appropriate questioning strategies to develop conceptual understanding, clarify to students the importance of abstract concepts and “big questions,” use formative assessments to improve instruction and achieve higher goals, and guarantee equitable access for all students to information and achievement.

   [↑](#footnote-ref-5)
6. Recognizing that these tables and figures are presented primarily to demonstrate the current status of UMDI’s analyses, rather than as statements about Pre-AP program impacts, UMDI chose to reduce the report’s length by 10 pages by presenting MCAS results for English only. However, parallel results for math and science have also been completed and could be provided to ESE or added to this report at ESE’s request. [↑](#footnote-ref-6)
7. “High needs” is a designation given by ESE to students who have been identified as receiving free or reduced-price lunch, students with disabilities, English language learners, or former English language learners. [↑](#footnote-ref-7)
8. UMDI compared our results to those reported by ESE, and found that, while very similar, the rates were different by up to 0.2%. For each year included in this analysis, the number of graduates included in MassCore calculations (by ESE and by UMDI) is greater than the number of graduates reported by ESE (4-year cohort graduation rate). [↑](#footnote-ref-8)