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**Advancing STEM and English AP**

**Program Evaluation—Year 7**

Final Report

**Advancing STEM and English AP Program**

**Evaluation—Year 7**

***Final Report***

### Prepared by the UMass Donahue Institute’s Applied Research & Program Evaluation Group

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# Executive Summary

The Massachusetts Department of Elementary and Secondary Education (DESE) is engaged in numerous initiatives to increase the college and career readiness of students in the Commonwealth, to reduce proficiency gaps and improve academic achievement for all population groups, and to enhance the “STEM pipeline” of students who are interested in and well prepared for postsecondary education and careers in science, technology, engineering, and mathematics (including computer science). One of these initiatives is the AP STEM and English program. As specified by DESE, the goals of the program center on promoting student achievement in Advanced Placement courses and exams, especially among historically underrepresented populations and school and teacher transformation related to the delivery and sustainment of AP programming.

To meet these program goals and track efforts to improve student achievement, DESE contracted with Mass Insight Education and Research (Mi) as a vendor to implement tasks and responsibilities aligned with the purposes of the program. The implementation of the statewide program involves four key tasks to be implemented in partner schools:

1. Increase participation and improve performance in AP science, mathematics, and ELA courses and on exams, with a focus on historically underserved students.
2. Increase the effectiveness of AP science, mathematics, and ELA teachers.
3. Increase the number of new and/or additional AP science, mathematics, and ELA courses offered by districts and schools in the Commonwealth.
4. Develop collaborations with other existing and/or newly established AP initiatives or organizations to build a robust and collaborative support system for historically underserved students, their parent(s)/guardian(s), and teachers.

In their work to complete these tasks, Mi is responsible for a variety of activities falling in three main tiers of assistance: 1) teacher supports, 2) student supports, and 3) school supports.

Mi content directors visit schools during the year to help with course design and curriculum development. **The focus of this report is on teacher supports provided by Mi staff that relate to the classroom, hereafter referred to as classroom–level supports.** Put simply, “classroom-level” supports are supports provided by content directors to AP teachers that *relate* to the AP classroom and are provided to AP teachers via email, phone, newsletters, in-person visits, etc. Classroom-level supports are not limited to the supports provided *inside* the AP classroom. Some supports provided at the classroom level are also provided by Mi staff during the Summer Institute, fall two-day training, and/or Saturday study sessions, although supports offered in these other contexts are not the focus of this evaluation.

UMDI, in consultation with Mi and DESE, has classified classroom-level assistance in the following sub- categories:

* Instructional coaching
* Course design
* Curriculum development
* Curriculum planning
* Knowledge of pedagogical practices
* Content knowledge
* Equipment and supplies (i.e., textbooks, equipment, etc.)
* Knowledge and guidance on textbook, equipment, and resource selections
* Feedback on instructional materials
* Sample unit exams
* Strategies for aligning course assessments to the AP exam
* Assistance with utilizing the Instructional Planning Report
* Classroom observation for instructional feedback
* Co-teach AP class with content director
* Content director modeled AP instruction
* Assistance in learning how AP exams are assessed
* Assistance in aligning school curriculum across grades 7–12
* Assistance in aligning AP class curriculum to the College Board AP curriculum

DESE contracted the University of Massachusetts Donahue Institute (UMDI) to conduct the multi-year evaluation of the program. Evaluation reports for Years 1–6 were previously submitted.

This report provides a summary of analyses completed during Year 7. The primary purpose of this report was to describe in what ways and to what extent the intervention was implemented as intended specific to teacher supports provided by Mi content directors primarily at the classroom level. This includes answering the degree to which teachers expressed a need for the various classroom-level support activities provided through the program, and also, the extent to which the provision and receipt of these services matched teachers’ expression of need for them. The scope of this evaluation was limited to teachers’ expression of need and provision/receipt of supports provided by content directors at the classroom level.

UMDI administered an online survey in March 2019 to all AP teachers that participated in the program during the 2018–19 school year. The study team also compared data provided by Mi to the survey data. This report provides a summary of findings from those data collection activities.

## Key findings

In brief, findings presented in this report indicated that:

1. AP teachers were knowledgeable about classroom-level support availability, although less than half requested each of the classroom-level supports evaluated;
2. Of the AP teachers who requested classroom-level supports from content directors, virtually all received assistance;
3. Of the AP teachers that received classroom-level supports from content directors, respondents were satisfied with the amount of support that was provided;
4. AP teachers varied in the extent to which they identified classroom-level supports as essential and needed, as their responses were associated with whether they requested the support; and
5. The fidelity of implementation of AP teacher classroom-level supports was below, and potentially well below, Mi’s vision of ideal program implementation—as described in the activities section of the program summary—given reported rates of take up for all classroom- level supports (9%–53%) contrasted with Mi describing classroom-level support activities as essential to the program.

Below is a summary of key findings, presented by topic of inquiry.

#### Teachers’ expression of need for support activities

* AP teachers were knowledgeable about the availability of the classroom-level supports offered by Mi’s content directors.
* Mi’s content directors were responsive to AP teachers’ requests for classroom-level supports. Although, less than half of respondents requested each support (between 6% and 41%, or n=11– 72).
* In all classroom-level support areas, Mi delivered assistance beyond just those AP teachers who requested services.
* Of the AP teachers that received each classroom-level support, most AP teachers reported that they received the support *1 time* or *5+ times*.
* Of the AP teachers that received each classroom-level support, most AP teachers reported that they spent a total of *15–60 minutes* or *more than 3 hours* receiving the support from content directors.
* Almost two-thirds (62%) of all respondents reported that their content directors communicated with them *less frequently than monthly* or on a *monthly* basis, and they were most frequently communicated with via *email* (92%).

#### Comparison of service provision to teachers’ expression of need

* Of the AP teachers that received each classroom-level support, almost all respondents indicated that the amount of support provided by the content director was sufficient for their AP classroom.
* The extent to which AP teachers indicated that each classroom-level support was essential for their AP classroom was associated with whether respondents requested the support. Respondents who requested the classroom-level support were more likely than respondents who did not request the support to indicate that the support was essential *to a great extent.*
* The extent to which AP teachers indicated that each classroom-level support was needed for their AP classroom was associated with whether respondents requested the support. Respondents that requested a classroom-level support were more likely to indicate a *moderate need* for the support, while respondents that did not request a classroom-level support were more likely to indicate a *low need* for the support.

#### Comparison of service provision to teachers’ expression of need

* For each classroom-level support type, no more than half of AP teachers reported ever receiving assistance from Mi content directors, and in many areas the proportion was less than one-third of AP teachers—despite all of these classroom-level supports being described by Mi as essential to the program. For many of the AP teacher supports provided at the classroom level by Mi- content directors, a plurality of AP teachers who reported receiving a support received that support one time.
* Despite most AP teachers describing all classroom-level supports as essential (at least *to a small* extent, and especially for AP teachers who requested the support), support receipt varied (9%– 53%). Mi described all classroom-level supports as essential, rather than optional. This apparent difference may indicate divergent views between Mi and program AP teachers as to whether these classroom-level supports are indispensable.

## Strategic Considerations

Several points for consideration emerged that could improve administration of the program and students’ and schools’ experiences with it. Further information relevant to each strategic consideration is provided in the body of the report.

* Mi could consider communicating with increased emphasis the importance and utility of the classroom-level supports provided by content directors. Survey findings indicated that a majority of AP teachers were knowledgeable about classroom-level support availability; however, less than half of AP teachers requested each of the classroom-level supports evaluated. This finding may be due to AP teachers not understanding the classroom-level supports, AP teachers’ busy schedules, and/or AP teachers not being interested in using the supports for a variety of reasons.
* Mi could consider expanding administrative processes to proactively assess or survey teachers’ need for supports, or develop standards to identify the services that content directors are required to offer teachers.
* DESE and Mi could consider communicating with greater emphasis that the program is not meant to wholly substitute for other teacher training and support opportunities (e.g., training sessions offered by the College Board). Some teachers may require more support than is available through the program.
* Mi, in collaboration with DESE, could consider further aligning program activities with descriptions of work in future bid responses. The study team observed some apparent incongruities between the work that was proposed and the description of the work being done in the field offered by Mi (e.g., reference to use of a walkthrough observation tool).
* Mi could consider augmenting the data it collects, and its processes for managing existing data.
* If further assessments of fidelity are conducted, DESE and Mi could consider prioritizing the following: services provided through the AP Summer Institute, fall two-day training, student regional study sessions, and student mock exams.

# Introduction

The Massachusetts Department of Elementary and Secondary Education (DESE) is engaged in numerous initiatives to increase the college and career readiness of students in the Commonwealth, to reduce proficiency gaps and improve academic achievement for all population groups, and to enhance the “STEM pipeline” of students who are interested in and well prepared for postsecondary education and careers in science, technology, engineering, and mathematics (including computer science).

One of these initiatives is the AP STEM and English program (hereafter, “the program”). As specified by DESE, the goals1 of the program are to:

1. Increase AP science, mathematics, and ELA course availability, particularly at schools with limited AP science, mathematics, and ELA offerings and high percentages of historically underserved students,
2. Increase historically underserved students’ participation in AP science, mathematics, and ELA courses, such that the demographics of these courses better reflect the diversity of the student population of the school and district,
3. Increase student performance in AP science, mathematics, and ELA courses,
4. Increase the number of students taking AP exams, particularly historically underserved students,
5. Increase the number of students scoring a 3 or higher on AP exams, particularly underrepresented minority students and students who are economically disadvantaged,
6. Increase readiness for college-level study in science, mathematics, and ELA fields, and
7. Improve science, mathematics, and ELA teacher effectiveness, including content knowledge and pedagogical skills.

To meet these program goals and track efforts to improve student achievement, DESE contracted with Mass Insight Education and Research (Mi) as a vendor to implement tasks and responsibilities aligned with the purposes of the program. The implementation of the statewide program involves four key tasks to be implemented in partner schools:

1. Increase participation and improve performance in AP science, mathematics, and ELA courses and on exams, with a focus on historically underserved students.
2. Increase the effectiveness of AP science, mathematics, and ELA teachers.

1 In a concurrent task of the Year 7 evaluation, UMDI is working with Mi and DESE to facilitate an updated conceptualization of the program’s goals.

1. Increase the number of new and/or additional AP science, mathematics, and ELA courses offered by districts and schools in the Commonwealth.
2. Develop collaborations with other existing and/or newly established AP initiatives or organizations to build a robust and collaborative support system for historically underserved students, their parent(s)/guardian(s), and teachers.

Mi has administered the program since the initiative’s inception in 2007 under the previous name, Mass Math + Science Initiative’s (MMSI) “Advanced Placement Training and Awards Program”. Eight schools’ comprised the program’s first cohort during the 2008–09 academic year; the program is on its 11th cohort as of the 2018–19 academic year. Beginning in 2013, schools that complete the now three-year core component of the program may transition to its Sustaining Partnership Program, which allows schools to access some of its supports while contributing to a greater share of expenses.

DESE contracted the University of Massachusetts Donahue Institute (UMDI) to conduct the multiyear evaluation of the program. Interim and final evaluation reports for Years 1–6 were submitted previously. As a concurrent task of the present year’s evaluation, UMDI is also facilitating an updated conceptualization of the program theory elements, the process and results of which are outlined in a separate deliverable.

This report is organized in two main sections. The first section presents findings from the survey of program teachers—respondents’ expression of need for teacher support activities and a comparison of service provision to the described level of need. This section also compares teachers’ reported receipt of services to Mi’s vision of ideal program implementation—as described in the activities section of the program summary. A second section compares data collected through the teacher survey versus limited data provided by Mi. A final section outlines strategic considerations emerging from this work.

## Supports Provided to Program Partner Schools

In their work to complete these tasks, Mi is responsible for a variety of activities, including:

* maintaining partnerships with schools with high percentages of minority and economically disadvantaged students,
* encouraging recruitment of minority and economically disadvantaged students into AP science and mathematics classes,
* educating stakeholders about the benefits of the AP program and STEM careers,
* assisting districts in eliminating barriers to STEM AP courses faced by typically underserved students,
* conducting extracurricular study sessions and test preparation sessions,
* providing exam fee subsidies to economically disadvantaged students,
* supporting professional development for STEM AP teachers,
* supporting teacher attendance at the College Board’s AP Summer Institute,
* encouraging curriculum alignment,
* providing guidance and funds for equipment in new or expanded STEM AP courses,
* monitoring teacher effectiveness and fidelity to the implementation of the program, and
* assisting vertical teams of grade 6–10 pre-AP trained science and mathematics teachers and STEM AP teachers.

The program tasks can be grouped in three tiers of support:

1. School partner support
2. Teacher training and support
3. Student support

**School partner support** includes selecting schools for the program, analyzing student barriers to AP class participation, supporting schools’ AP recruitment, and providing equipment and supplies funding. Mi staff encourage increased AP enrollment through discussions with school guidance counselors and other administrators (including conversations on breaking down student barriers to AP classes), talking with parents during school parent nights, and meeting with groups of students encouraging them to participate. School staff are instructed to look for potential students who have the desire to do the work but may lack the required skills. These types of supports are only provided on-request. The Mi director of programs meets with senior school administrators for conversations about adding AP classes. During the first three years a school is in the program, the school receives money back from program fees for equipment and supplies; an increased amount typically is provided in the first year.

**Teacher training and support** includes professional development, ongoing teacher coaching and support by Mi content experts, teacher stipends, and support with vertical alignment. Mi provides seven full days of support annually to teachers from participating high schools—five days during its Advanced Placement Summer Institute, and an additional two days in an October session. AP class teachers from the program’s core schools may (but are not required by Mi to) attend the summer training for up to two of the core program’s three years (teachers from sustaining schools are not financially supported by the program to attend the summer training); topics focus on helping teachers develop instructional approaches, identifying areas of increased student preparation, and sharing best practices and model lessons. A small stipend is provided. Attendance is not tracked by Mi, but may be tracked by participating districts—new teachers usually make up the largest group attending the trainings, but Mi encourages full participation (i.e., all potential AP teachers in a given subject area). The October two-day sessions are open to AP teachers from any program and are tailored to schools’ specific needs.

Mi content directors visit schools during the year to help with course design and curriculum development. **The focus of this report is on teacher supports provided by Mi staff that relate to the classroom, hereafter referred to as classroom-level supports.** Put simply, “classroom-level” supports are supports provided by content directors to AP teachers that *relate* to the AP classroom and are provided to AP teachers via email, phone, newsletters, in-person visits, etc. Classroom-level supports are not limited to the supports provided *inside* the AP classroom. Some supports provided at the classroom level are also provided by Mi staff during the Summer Institute, fall two-day training, and Saturday study sessions, although supports offered in these other contexts are not the focus of this evaluation. UMDI, in consultation with Mi and DESE, has classified classroom-level assistance in the following sub- categories, which is mirrored in the ensuring report sections:

* Instructional coaching
* Course design
* Curriculum development
* Curriculum planning
* Knowledge of pedagogical practices
* Content knowledge
* Equipment and supplies (i.e., textbooks, equipment, etc.)
* Knowledge and guidance on textbook, equipment, and resource selections
* Feedback on instructional materials
* Sample unit exams
* Strategies for aligning course assessments to the AP exam
* Assistance with utilizing the Instructional Planning Report
* Classroom observation for instructional feedback
* Co-teach AP class with content director
* Content director modeled AP instruction
* Assistance in learning how AP exams are assessed
* Assistance in aligning school curriculum across grades 7–12
* Assistance in aligning AP class curriculum to the College Board AP curriculum

For a description of each sub-type of classroom-level support provided by Mi’s content directors (as well as descriptions of the other support types the program provides), including the linking of the program’s key elements to level of essentialness and whether each is required, please see Appendix A. Examples of

assistance range from classroom visits and feedback to co-teaching lessons and providing instructional resources. Mi may provide support with vertical alignment of curricula in these content areas, but in practice, it is a secondary priority and up to individual districts to provide the time and resources to support vertical alignment activities. Mi encourages AP program coordination with pre-AP classes and pre-AP teacher training, but these linkages are subordinate to other activities and not typically a focus of the work.

**Student support** includes study sessions and exam fee subsidies. The study sessions are organized on Saturdays three times (per content area) during the school year, where students from the same region meet centrally to receive tutoring geared toward exam topics and take mock exams scored by AP readers.

# Fidelity Study Focus and Description

This section describes the questions guiding the evaluation, specific methods for evaluating if the program was implemented as intended, the process of selecting schools to be included in the primary data collection—a web-based survey of teachers, supplementary data included in the evaluation, and the process by which the survey was developed and administered.

## Guiding Questions

The evaluation sought to address the following question, which guided the data collection and analysis presented in this report:

1. In what ways and to what extent is the intervention implemented as intended?
   1. What is the degree to which teachers express a need for the various teacher support activities?
   2. To what extent does the provision/receipt of these services match the expression of need?

Due to finite evaluation resources and a responsiveness to the evaluation priorities of DESE, the fidelity study focused on a subset of supports offered by Mi through the AP STEM and English program— namely, teacher supports provided by Mi staff at the classroom level, as described in the introduction above. The scope of this evaluation was limited to teachers’ expression of need and provision/receipt of supports. Some supports provided at the classroom level are also provided by Mi staff during the Summer Institute, fall two-day training, and Saturday study sessions, although supports offered in these other contexts are not the focus of this evaluation. The data collection activities outlined below maintain this programmatic content focus.

## Methods

At the launch of this study, UMDI developed in collaboration with Mi and DESE a summary description of the program. The primary data collection activity that informed this study was a survey of all AP teachers participating in the program during school year 2018–19 who also attended a Mi training. This report also includes information collected from Mi through a secondary data request. Each of these activities is summarized below.

#### Defining the program (AP STEM and English program summary)

Clearly defining the intervention was a first and necessary step in conducting the fidelity study. UMDI worked closely with DESE and Mi to clarify the intended inputs, activities, outcomes, and goals of the program. For a complete draft of the summary, see Appendix A. The summary is organized by program

theory topic and documents descriptions of goals, inputs, activities, outputs, and short and long-term outcomes.

UMDI drafted the summary from a review of key documents submitted by DESE and Mi, which also included a review and synthesis of publicly available information.2 UMDI, in consultation with DESE and Mi, refined the summary through an iterative process that included:

* Initial phone conversations separately with DESE and Mi to hear reactions to an initial program summary draft,
* DESE and Mi responses to 1) a web-based survey attempting to more precisely document aspects of the program’s inputs, activities, and outputs (e.g., which aspects of the intervention are essential/optional, to which schools if there is a distinction, and in the outputs section, minimum/recommended dosage; and 2) a Word document outlining the program’s goals, outcomes, and impacts, and
* DESE, Mi, and UMDI completed an in-person review to discuss areas of divergence.

The summary includes two important descriptors for most activities and program outputs: 1) the extent to which each item is deemed essential to the program or, in some cases, a required program component (as specified by Mi), and 2) recommended dosages of each output, where applicable. UMDI used the summary—specifically, the activities section of the summary—as a reference for understanding and organizing the classroom-level supports provided by Mi content directors in the teacher survey, and later, as a benchmark for comparing the results from the survey and Mi-provided data connected to service receipt to the extent the program was implemented as intended.

#### Teacher survey

The primary data collection instrument was an online survey targeted to each school participating in the program. This data collection format was designed to assess both sub-parts of the evaluation question; specific topics of the survey included 1) teachers’ expression of need for classroom-level support activities, 2) a comparison of service provision to the expression of need, and, 3) a comparison of service provision to ideal program administration. Again, each topic was focused on teacher supports provided by Mi staff at the classroom level.

The survey instrument was developed from mid-January through early March of 2019, heavily adapting information included in the activities section of the program summary. The study team selected program activities as the point of comparison (versus other components of the program summary, such as outputs) because the content of the teacher survey aligned with whether AP teachers ever received

2 Documents reviewed spanned current legislation, key Mi-provided documents (e.g., bid responses, existing program descriptions, implementation data, and evaluation reports), and program descriptions available through DESE (e.g., COMMBUYS bid, performance measures).

these services at least once, and not whether respondents received the recommended volume of inputs or outputs. Essentially, the survey facilitated an analysis of whether the activities were conducted and not how much resources were entered or expended. This had implications for which portion of the program summary was used to assess the extent to which the program was implemented as intended. UMDI worked closely with Mi and DESE to identify appropriate supports to include in the survey. The study team shared survey drafts with DESE and Mi for review, and the survey was refined through an iterative process.3 During this time, the evaluation team worked with Mi to identify each teacher trained in the program from each participating school. For a full draft of the survey, please see Appendix B.

Survey invitations were distributed on March 8th, 2019. The survey remained open through April 17th, 2019. Non-respondents, as well as those who had begun-but-not-completed the survey, received six email reminders. A Mi team member sent one additional notice to participants shortly after the survey was administered to encourage maximum respondent participation.

Surveys were administered to all AP teachers participating in the program during the 2018–19 school year, including schools participating in both phases of the intervention (both the core and sustaining program components). Mi provided the full list of AP teachers as respondents, including contact information. The survey was sent to a total of 554 AP teachers from 82 schools, of which 191 AP teachers (34%) from 69 schools completed the survey. Previous surveys of AP STEM and English teachers (Year 4) and administrators (Year 6) had similar, but slightly higher, response rates (45% each).

Similar to other studies that rely on self-reported data, the information gathered through the survey should be interpreted with caution. Here we note two specific threats to the validity of the study results:

1. Sample selection—We are not sure of the extent to which the sample of AP teachers who responded are representative of the full population asked to complete the survey. Relatedly, not all respondents had an equal opportunity to engage in program activities. Those who joined during earlier years of the program may not have had access to the same supports offered to AP teachers who joined more recently, and those who joined during recent years did not have as much time to receive support.
2. Recall bias—We are not sure of the extent to which the sample of AP teachers who responded to the survey were able to accurately remember past events, particularly respondents that joined during earlier years of the program.

3 At the conclusion of the Year 7 evaluation, Mi noted that a subset of content director supports were also offered in contexts outside of the scope of the survey (e.g., at the Summer Institute). These supports included: *assistance in learning how AP exams are assessed*; *equipment and supplies (i.e., textbooks, equipment, etc.)*; *knowledge and guidance on textbook, equipment, and resource selections*; *assistance with utilizing the Instructional Planning Report*; and *assistance in aligning school curriculum across grades 7–12*.

#### 

#### Respondent profiles

In addition to questions that addressed the extent to which the program was implemented as intended, survey respondents were also asked to provide basic information about their background, including:

* School
* Teaching experience (years both as a teacher overall and years teaching AP courses)
* Year of first participation in the AP STEM and English program
* Content area

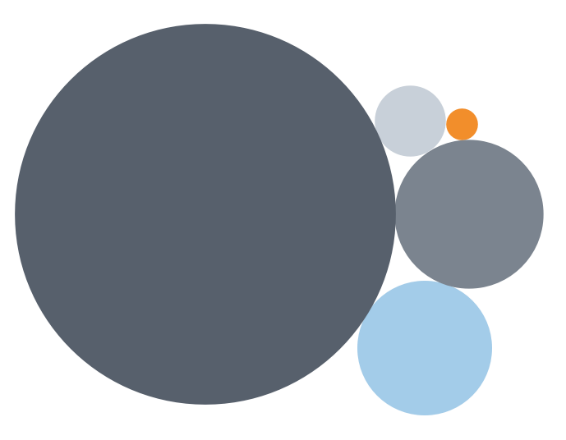
Most of the 69 schools with teachers responding only had one or two AP teachers complete the survey. Auburn High School saw the highest survey participation with seven AP teachers, and Lowell, New Bedford, and North (Worcester) high schools all had six AP teachers respond. Twenty-eight schools had two AP teachers complete the survey, and ten schools had one AP teacher respond.

As illustrated in Figure 1 below, of the 191 AP teachers that completed the survey, more than three-quarters had been teachers for more than ten years. Approximately one-fifth of respondents reported teaching for four to ten years. Only 4% of AP teachers had been teaching for three years or less.

###### Figure 1: Teaching experience

**1–3 years**

**3%**



**7–10 years**

**10%**

**4–6 years**

**12%**

**This is my first year**

**1%**

**More than 10 years**

**76%**

Considering respondents’ AP teaching experience (see Figure 2 on the following page), *4–6 years* was the most common response, at 29%. Almost one-quarter of AP teachers reported that they had *7–10 years* of AP teaching experience, while approximately one-fifth of respondents had *more than 10 years* or *1–3 years* of experience.

###### Figure 2: AP teaching experience



**More than 10 years**

**20%**

**4–6 years**

**29%**

**7–10 years**

**24%**

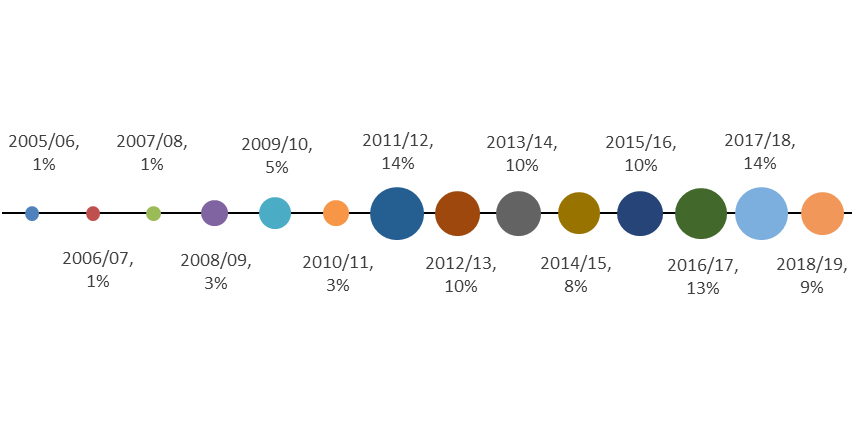
**This is my first year**

**9%**

**1–3 years**

**18%**

Figure 3 below illustrates the portion of survey respondents that joined the AP STEM and English program each year, beginning during the 2005–2006 school year. Most teachers joined during, or after, the 2011–12 school year.



###### Figure 3: Year when respondents joined the program

Across the three content areas that are involved in the AP STEM and English program, the portion of respondents from each content area was relatively similar. As shown in Figure 4 on the following page, a slightly larger share of AP English teachers, and a slightly smaller share of math AP teachers—compared to those in science—completed the survey.

###### Figure 4: Percentage of respondents from each content area

**Math**

**29%**

**English**

**38%**

**Science**

**33%**

For a full discussion of the survey results related to the extent the program is implemented as intended, see the findings section below.

#### Review of implementation data provided by Mi

As a complement to the data collected through the teacher survey, UMDI reviewed implementation data provided by Mi—namely—records of content director engagement in teacher training and support at the school level. This request was designed to supplement the exploration of how teachers characterized the need for each type of classroom-level support (in other words, the extent there may be a mismatch been the importance of a specific sub-activity and the incidence of take-up).

UMDI developed a draft set of data elements to be requested, and then discussed the request with Mi by phone to present and clarify any questions about the request. It was necessary for UMDI to amend the request based on a developing understanding of the information tracked by Mi that was easily accessible and transferrable. Originally, UMDI requested a log of all interactions by Mi content directors by date, subject area, the teacher contacted, and mode of contact; additionally the study team inquired about the possibility of receiving this data for previous years (at least the 2017–18 and 2018–19 school years, but ideally beginning with data collected from the program’s commencement in 2011) and for both schools in the core and sustaining programs.

The ultimate request, fulfilled by Mi, consisted of a log of the approximate total number of interactions (contacts) between content directors and each participating school in the core program for school year 2017–18. The template developed by UMDI included a breakdown of contacts made in-person by Mi content directors compared to estimates of other modes of contact (e.g., by phone or email) by school; it also contained the AP subject areas in which the school participated in the program.

In contrast to the original request, the data provided was limited to one school year (2017–18), was at the school (and not teacher) level, and noted the approximate number of: total contacts, in-person contacts, and other contacts (e.g., phone, email). Availability of Mi-provided data limited the request, and ultimately, UMDI’s analysis.

It is important to note several areas of divergence between the Mi-provided data and the survey data:

* The survey was sent to all teachers participating in the program during the 2018–19 school year, whereas the Mi-provided data was for the school year 2017–18,
* Teachers included in the survey were all teachers who participated in a Mi training (and not necessarily active AP teachers in the program’s subject areas), versus the Mi-provided data restricted to active AP teachers in the program,
* The universe of teachers invited to complete the survey included those from schools in both the core and sustaining components of the program, whereas the Mi-provided data was only for schools in the core program, and
* The information on contact frequency collected in the survey was more detailed than the contact frequency reported by Mi (e.g., the Mi-provided data was aggregated to the school level; additionally, the survey included estimated time spent receiving assistance from a Mi- content director per teacher).

The precise methodology for comparing the relative level of activity within the program between these two data sources is summarized in the corresponding section below.

# Findings on Program Implementation

Findings related to the ways in which, and the extent to which, the AP STEM and English program has been implemented as intended are presented below. As previously mentioned, due to the restrictions of the Year 7 evaluation, this analysis is limited to the classroom-level teacher supports provided by the content directors.

This findings section is organized into three subsections:

1. Teachers’ expression of need for support activities,
2. Comparison of service provision to teachers’ expression of need, and
3. Comparison of service provision to ideal program administration.

Findings from the first two subsections, teachers’ expression of need for support activities and comparison of service provision to teachers’ expression of need, were analyzed from data gathered through the teacher feedback survey. Within these two sub sections, survey questions were generally presented in the order in which questions were asked on the survey. Although, results for some questions were reordered for clarity and ease of reading. Findings from the third sub section, comparison of service provision to ideal program administration, also utilized the teacher feedback survey. In particular, two specific questions were used from the survey. One that asked participants whether they received classroom-level supports from Mi’s content directors, and another that asked about the number of times they received each support. The third subsection also generated findings from an internal document referred to as the AP STEM and English Program Summary (Appendix A), a 13-page document that described the AP STEM and English program.

Below are the key findings that discuss the way in which, and the extent to which, the AP STEM and English program is being implemented as intended.

## Summary of key findings

* AP teachers were knowledgeable about the availability of the classroom-level supports offered by Mi’s content directors.
* Mi’s content directors were responsive to AP teachers’ requests for classroom-level supports, although less than half of respondents requested each support.
* In all classroom-level support areas, Mi delivered assistance beyond just those AP teachers who requested services.
* Of the AP teachers who received each classroom-level support, most AP teachers reported that they received the support *1 time* or *5+ times*.
* Of the AP teachers who received each classroom-level support, most AP teachers reported that they spent a total of either *15–60 minutes* or *more than 3 hours* receiving the support from content directors.
* Almost two-thirds (62%) of respondents reported that their content directors communicated with them *less frequently than monthly* or on a *monthly* basis, and the most frequent mode of contact was *email* (92%).
* Of the AP teachers who received each classroom-level support, almost all respondents indicated that the amount of support provided by the content director was sufficient for their AP classroom.
* The extent to which AP teachers indicated that each classroom-level support was essential for their AP classroom was associated with whether respondents requested the support. Respondents who requested the classroom-level support were more likely than respondents who did not request the support to indicate that the support was essential *to a great extent*.
* The extent to which AP teachers indicated that each classroom-level support was needed for their AP classroom was associated with whether respondents requested the support. Respondents who made the request were more likely to indicate a *moderate need* for the support, while respondents that did not were more likely to indicate a *low need* for the support.
* For each classroom-level support type, no more than half of AP teachers reported ever receiving assistance from Mi content directors, and in many areas the proportion was less than one-third of AP teachers—despite all of these classroom-level supports being described by Mi as essential to the program. For many of the AP teacher supports provided at the classroom level by Mi- content directors, a plurality of AP teachers who reported receiving a support received that support one time.
* Despite most AP teachers describing all classroom-level supports as essential (at least *to a small extent,* and especially for AP teachers who requested the support), support receipt varied (9%– 53%). Mi described all of the classroom-level supports provided by content directors as essential, rather than optional. This apparent difference may indicate divergent views between Mi and program AP teachers as to whether these classroom-level supports are indispensable.

## Teachers’ expression of need for support activities

AP teachers were asked several multi-part questions through the teacher feedback survey, to assess the expression of need for classroom-level teacher support activities offered by Mi’s content directors.

These questions included: knowledge of classroom-level support availability, whether classroom-level supports were requested and/or received, frequency and duration of classroom-level supports received, and means of communication with content directors.

#### Knowledge of support availability & supports requested and received

Respondents were prompted to indicate whether they knew each of the 18 classroom-level supports was available, whether they requested the support, and whether they received they support. These three sub questions were asked through yes/no questions for each classroom-level support.

##### Knowledge of support availability

In general, the majority of AP teachers were knowledgeable about the availability of the classroom-level supports offered by Mi’s content directors. Results from the teacher feedback survey indicated that, for each of the 18 classroom-level supports, at least a small portion of AP teachers were not aware of their availability. As shown in Figure 5 on the following page, *content knowledge*, *instructional coaching*, *knowledge of pedagogical practices*, and *assistance in learning how AP exams are assessed* were the most well-known classroom-level supports offered by the content directors, with at least 80% of AP teachers reporting that they were aware of these supports.

###### Figure 5: Awareness of supports available from content directors

While most AP teachers indicated that they were aware of most classroom-level supports, more than one-third of respondents reported that they did not know that Mi content directors offered *sample unit exams*, *feedback on instructional materials*, and *equipment and supplies*. Furthermore, half indicated that they were not aware that Mi offered *assistance with utilizing the Instructional Planning Report*, and nearly two-thirds were not aware of *assistance in aligning school curriculum across grades 7–12*.

Depending on the extent to which these five classroom-level supports are considered essential, efforts designed to increase participants’ knowledge of the availability of these supports could be beneficial.

##### Request for support and supports received

Throughout the duration of the AP STEM and English program, AP teachers have made hundreds of requests for classroom-level supports from Mi’s content directors. Columns two and three in Table 1 show the percent and number of teacher feedback survey respondents that *requested* each classroom- level support. As shown, the percentage of survey respondents requesting each type of classroom-level support ranges from 6% (*assistance in aligning school curriculum across grades 7–12*) to 41% (*assistance*

*in learning how AP exams are assessed*). This table indicates that, of the AP teachers that responded to the survey, less than half requested each of the classroom-level supports offered by content directors.

###### Table 1: Request and receipt of the supports offered by content directors

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Support** | **Support Requested**  **% N** | | **Support Received**  **% N** | |
| Assistance in learning how AP exams are assessed | 41% | 72 | 53% | 89 |
| Sample unit exams | 35% | 61 | 49% | 82 |
| Equipment and supplies (i.e., textbooks, equipment, etc.) | 38% | 67 | 45% | 74 |
| Curriculum planning | 29% | 51 | 45% | 75 |
| Content knowledge | 34% | 59 | 44% | 71 |
| Instructional coaching | 32% | 59 | 43% | 74 |
| Knowledge and guidance on textbook, equipment, and resource selections | 34% | 60 | 42% | 69 |
| Knowledge of pedagogical practices | 26% | 45 | 39% | 63 |
| Strategies for aligning course assessments to the AP exam | 27% | 48 | 38% | 63 |
| Curriculum development | 25% | 44 | 37% | 61 |
| Feedback on instructional materials | 30% | 52 | 35% | 57 |
| Content director modeled AP instruction | 30% | 53 | 34% | 56 |
| Course design | 23% | 41 | 34% | 57 |
| Assistance in aligning AP class curriculum to the College Board AP curriculum | 22% | 39 | 29% | 48 |
| Co-teach AP class with content director | 21% | 38 | 25% | 41 |
| Assistance with utilizing the Instructional Planning Report | 16% | 28 | 25% | 40 |
| Classroom observation for instructional feedback | 15% | 27 | 20% | 32 |
| Assistance in aligning school curriculum across grades 7–12 | 6% | 11 | 9% | 15 |

Note: In this table, N represents the number of participants that responded to the support request question and support received question, each under their own corresponding column.

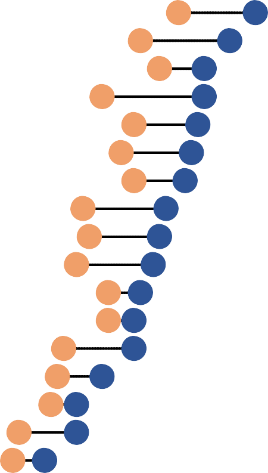
Table 1 (columns four and five) also shows the percentage and number of respondents that reported *receipt* of classroom-level supports—by type—as well as the portion of AP teachers that received each support. Impressively, of the hundreds of requests Mi received from participating AP teachers—at least 855 requests—virtually all AP teachers reported having received the classroom-level support they requested.4 Additionally, survey results indicated that Mi has also provided each classroom-level support to a number of AP teachers who did *not* request the support, as Mi uses strategies to identify teachers

4 Only nine respondents indicated that they made a request for a classroom-level support, but have not yet received it. At least in part, this may be due to (1) a classroom-level support being scheduled for the near-future, or (2) respondents from sustaining status schools no-longer having access to supports that are only provided to schools in core status.

believed to benefit from additional support. Figure 6 indicates the percentage of respondents that requested each classroom-level support and the percentage of respondents that received the support.

###### Figure 6: Request and receipt of the supports offered by content directors

Assistance in learning how AP exams are assessed



**41%**

**53%**

**35%**

**49%**

**38% 45%**

**29%**

**45%**

**34%**

**44%**

**32%**

**43%**

**34% 42%**

**26%**

**39%**

**27%**

**38%**

**25% 37%**

**30% 35%**

**30% 34%**

**23%**

**34%**

**22% 29%**

**21% 25%**

**16%**

**25%**

**15% 20%**

**6% 9%**

Sample unit exams Equipment and supplies Curriculum planning Content knowledge Instructional coaching

Knowledge and guidance on resource selections Knowledge of pedagogical practices

Strategies for aligning course assessments to the AP exam

Curriculum development Feedback on instructional materials Content director modeled AP instruction

Course design Align AP class to the College Board AP curriculum Co-teach AP class with content director

Assistance with utilizing the Instructional Planning Report Classroom observation for instructional feedback Align school curriculum across grades 7–12

0% 10% 20% 30% 40% 50% 60%



Requested

Received

As shown in Figure 6 above, approximately half of respondents reported that they received *assistance in learning how AP exams are assessed* (53%) and *sample unit exams (49%)*. More than two-fifths of respondents reported having received *equipment and supplies*, *curriculum planning*, *content knowledge*, *instructional coaching*, and *knowledge and guidance on textbook, equipment, and resource selections*.

One-fourth or less of respondents indicated that they received *co-teach AP class with content director*, *assistance with utilizing the Instructional Planning Report*, *classroom observation for instructional feedback*, or *assistance in aligning school curriculum across grades 7–12*.

Mi noted to the evaluation team that each of these classroom-level supports was an important part of their program, however, AP teachers’ participation with classroom-level supports was ultimately decided by the teacher, or the school/district, as the AP STEM and English program is currently a paid- for service.5

#### Frequency and duration of supports received

Respondents were asked to specify the frequency with which they had ever received classroom-level supports from Mi’s content directors, as well as the duration of time they spent receiving those supports. To measure frequency, respondents who indicated they had received a classroom-level support were asked to identify the number of times they had ever received the support, on a scale from *1 time* to *5+ times*. Additionally, respondents were asked to estimate the total amount of time they had spent receiving each classroom-level support through the following scale: *less than 15 minutes*, *15–60 minutes*, *1–2 hours*, *2–3 hours*, or *more than 3 hours*.

Survey respondents were also asked to describe the equipment and supplies and the knowledge and guidance they had received from content directors.

##### Frequency of supports received

Table 2 on the following page shows a full list of the number of times respondents reported receiving classroom-level support from Mi content directors.6 Respondents were asked to indicate the frequency with which they received support for 16 of the 18 classroom-level supports evaluated, as two supports—equipment and supplies and knowledge and guidance on resource selection—were examined through open-ended measures.

5 Please refer to Appendix C for the portion of teachers that requested and received one support, two supports, three supports, etc.

6 Respondents were only permitted to pinpoint the frequency with which they received a classroom-level support if they indicated that they received the support in Question 1. As such, the total n for each classroom-level support may be different from the total n described in previous tables.

###### Table 2: Number of times teachers received supports

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Number of Times Support Received** | | | | | | |
| **Support** | **1 Time** | **2 Times** | **3 Times** | **4 Times** | **5+**  **Times** | **N**  **(responses)** |
| Assistance in learning how AP exams are assessed | 44% | 18% | 10% | 7% | 21% | 68 |
| Instructional coaching | 25% | 18% | 25% | 8% | 25% | 65 |
| Sample unit exams | 40% | 17% | 10% | 6% | 27% | 63 |
| Curriculum planning | 32% | 25% | 7% | 7% | 30% | 60 |
| Content knowledge | 20% | 16% | 16% | 5% | 42% | 55 |
| Strategies for aligning course assessments to the AP exam | 35% | 12% | 16% | 2% | 35% | 49 |
| Course design | 30% | 30% | 13% | 4% | 23% | 47 |
| Curriculum development | 21% | 36% | 17% | 4% | 21% | 47 |
| Content director modeled AP instruction | 45% | 17% | 19% | 6% | 13% | 47 |
| Knowledge of pedagogical practices | 20% | 23% | 11% | 5% | 41% | 44 |
| Feedback on instructional materials | 36% | 32% | 9% | 5% | 18% | 44 |
| Co-teach AP class with content director | 54% | 21% | 8% | 5% | 13% | 39 |
| Assistance in aligning AP class curriculum to the College Board AP curriculum | 37% | 33% | 7% | 3% | 20% | 30 |
| Assistance with utilizing the Instructional Planning Report | 46% | 14% | 18% | 7% | 14% | 28 |
| Classroom observation for instructional feedback | 44% | 26% | 11% | 7% | 11% | 27 |
| Assistance in aligning school curriculum across grades 7–12 | 55% | 0% | 27% | 0% | 18% | 11 |

Note: Two classroom-level supports were omitted from the frequency portion of Question 2 and were only examined through open-ended measures: (1) equipment and supplies and (2) knowledge and guidance on resource selection.

Considering the number of times AP teachers utilized each classroom-level support, respondents were most likely to report that they received the support one time, with *1 time* being the most common response for 13 of the 16 supports listed. The portion of AP teachers indicating they received the classroom-level support *1 time* ranged from 20–55% (mean = 36%). The second most common selection for frequency was *5+ times*, with this being the most common response for four classroom-level supports: *content knowledge* (42%), *knowledge of pedagogical practices* (41%), *strategies for aligning course assessments to the AP exam* (35%), and *instructional coaching* (25%).7 As shown in Table 2, *4 times* was the least common response option, with 0–8% of teachers choosing this option.

7 *1 time* was the most common response for 13 classroom-level supports and *5+ times* was the most common response for four supports. This totals to more than 16 because of “tied” percentages. For more specifics, please refer to Table 2.

Figure 7 shows the number of respondents that indicated they received classroom-level supports one time or more (specific x-axis numbers are noted in Table 2 on the previous page). The figure below also illustrates, for each of the 16 classroom-level supports, the portion of respondents that selected each option, from *1 time* to *5+ times*.8 For specific scale point percentages, please refer to Table 2 on the previous page.

###### Figure 7: Number of times teachers received supports

Assistance in learning how AP exams are assessed

Instructional coaching Sample unit exams Curriculum planning Content knowledge

Strategies for aligning course assessments to the AP exam

Course design Curriculum development

Content director modeled AP instruction Knowledge of pedagogical practices Feedback on instructional materials

Co-teach AP class with content director Align AP class curriculum to College Board AP curriculum Assistance with utilizing the Instructional Planning Report Classroom observation for instructional feedback

Align school curriculum across grades 7–12

0 20 40 60 80

Number of respondents that indicated they received each support 1 time or more

1 Time 2 Times 3 Times 4 Times 5+ Times

##### Duration of supports received

Table 3 on the following page notes the total amount of time AP teachers reported having ever spent receiving each classroom-level support from Mi’s content directors, and also notes the number of AP teachers who responded for each classroom-level support type, for 16 of the 18 supports.9 *Equipment and supplies* and *knowledge and guidance on resource selection* were examined through open-ended measures.

8 Portion of respondents that selected each scale-point, *1 time* to *5+ times*, was specific to each classroom-level support and should not be compared across classroom-level supports.

9 AP teachers were permitted to respond to the question on duration for each support they received, as reported in Question 1. As such, the total n for each classroom-level support may be different from the total n described in previous tables.

###### Table 3: Amount of time teachers spent receiving supports

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Total amount of time spent receiving support from content director** | | | | | | |
| **Support** | **< 15**  **minutes** | **15–60**  **minutes** | **1–2**  **hours** | **2–3**  **hours** | **> 3**  **hours** | **N**  **(responses)** |
| Assistance in learning how AP exams are assessed | 14% | 33% | 20% | 9% | 23% | 64 |
| Instructional coaching | 7% | 19% | 25% | 20% | 29% | 59 |
| Sample unit exams | 44% | 25% | 11% | 4% | 18% | 57 |
| Curriculum planning | 16% | 29% | 27% | 4% | 24% | 55 |
| Content knowledge | 14% | 25% | 20% | 8% | 33% | 51 |
| Course design | 9% | 32% | 30% | 7% | 23% | 44 |
| Content director modeled AP instruction | 2% | 21% | 26% | 14% | 37% | 43 |
| Curriculum development | 12% | 26% | 24% | 10% | 29% | 42 |
| Strategies for aligning course assessments to the AP exam | 24% | 14% | 29% | 12% | 21% | 42 |
| Knowledge of pedagogical practices | 15% | 20% | 20% | 15% | 30% | 40 |
| Feedback on instructional materials | 18% | 35% | 18% | 8% | 23% | 40 |
| Co-teach AP class with content director | 3% | 27% | 24% | 11% | 35% | 37 |
| Assistance in aligning AP class curriculum to the College Board AP curriculum | 15% | 48% | 15% | 7% | 15% | 27 |
| Classroom observation for instructional feedback | 0% | 25% | 33% | 17% | 25% | 24 |
| Assistance with utilizing the Instructional Planning Report | 27% | 36% | 5% | 14% | 18% | 22 |
| Assistance in aligning school curriculum across grades 7–12 | 0% | 14% | 43% | 0% | 43% | 7 |

Note: Two supports were omitted from the frequency portion of Question 2 and were only examined through open-ended measures: (1) equipment and supplies and (2) knowledge and guidance on resource selection.

As shown in Table 3 above, the total amount of time spent receiving the classroom-level supports varied. For seven of the 16 classroom-level supports, *more than 3 hours* was the most common response for duration. These supports included: *instructional coaching*, *content knowledge*, *content director modeled AP instruction*, *curriculum development*, *knowledge of pedagogical practices*, *co-teach AP class with content director*, and *assistance in aligning school curriculum across grades 7–12*. The portion of AP teachers indicating they received the classroom-level support for *more than 3 hours* ranged from 15% to 43% (mean = 27%).

Another common selection for duration was *15–60 minutes*, with this being the most common response for six classroom-level supports, including: *assistance in learning how AP exams are assessed*, *curriculum planning*, *course design*, *feedback on instructional materials*, *assistance in aligning AP class curriculum to*

*the College Board AP curriculum*, and *assistance with utilizing the Instructional Planning Report*. The range in which AP teachers selected this response spanned from 14% to 48% (mean = 27%).

Of the five duration responses available, *2–3 hours* was the least common response for almost every classroom-level support listed, with 0–20% of teachers selecting this response (mean = 10%).

Figure 8 below shows the number of respondents that selected a response for this question (specific x- axis numbers are noted in Table 3 on the previous page). The figure also illustrates, for each of the 16 classroom-level supports, the portion of respondents that selected each option, from *less than 15 minutes* to *more than 3 hours*.10 For specific scale point percentages, please refer to Table 3 on the previous page.

###### Figure 8: Amount of time teachers spent receiving supports

Assistance in learning how AP exams are assessed

Instructional coaching Sample unit exams Curriculum planning Content knowledge Course design

Content director modeled AP instruction

Curriculum development Strategies for aligning course assessments to the AP exam

Knowledge of pedagogical practices Feedback on instructional materials

Co-teach AP class with content director Align AP class curriculum to College Board AP curriculum Classroom observation for instructional feedback Assistance with utilizing the Instructional Planning Report Align school curriculum across grades 7–12

0 20 40 60 80

Number of respondents that indicated the amount of time they spent receiving teacher supports

Less Than 15 Minutes 15-60 Minutes 1-2 Hours 2-3 Hours More Than 3 Hours

10 Portion of respondents that selected each scale-point, *less than 15 minutes* to *more than 3 hours*, was specific to each support and should not be compared across supports.

##### A comparison: Frequency to duration of supports received

Several interesting findings arose when results from “frequency of supports received” were compared to the “duration of supports received”. These findings included: (1) some supports were received less frequently, and required a significant time commitment (*more than three hours*), (2) some supports

were received less frequently, and did not require a significant time commitment, and (3) some supports were received frequently, and required a significant time commitment. Only one support was received frequently and did not require a significant time commitment.11

Some supports were received less frequently, and required a significant time commitment

Results suggested that some of the classroom-level supports offered by Mi’s content directors required a significant time commitment, but were not received very often by participating AP teachers. For four of the classroom-level supports (*instructional coaching*, *content director modeled AP instruction*, *co- teach AP class with content director*, and *assistance in aligning school curriculum across grades 7–12*), *1 time* was the most common response for frequency and *more than 3 hours* was the most common response for duration. This indicated that, even though the classroom-level support was only received once for a plurality of AP teachers who received the support, these classroom-level supports take a significant time commitment, on the part of both the AP teacher and the content director.

Another classroom-level support that was received less frequently and required a significant time commitment was curriculum development. The most common response for frequency was *2 times*, and *more than 3 hours* was the most common response for duration.

Some supports were received less frequently, and did not require a significant time commitment

Data showed that other classroom-level supports did not require a significant time commitment for teachers, and did not need to be received very often. For six classroom-level supports (*assistance in learning how AP exams are assessed*, *curriculum planning*, *course design*, *feedback on instructional materials*, *assistance in aligning AP class curriculum to the College Board AP curriculum*, and *assistance with utilizing the Instructional Planning Report*), *15–60 minutes* was the most common response for duration and *1 time* was the most common choice for frequency. Also, for two classroom-level supports (*strategies for aligning course assessments to the AP exam* and *classroom observation for instructional feedback*), *1 time* was the most common response for frequency and *1–2 hours* was the most common response for duration. These results indicated that, for a plurality of AP teachers who received the support, most received the classroom-level support only once and did not spend a significant amount of time receiving the support from content directors.

11 Findings in this section were based on the most common responses to support frequency and duration. Several supports had more than one “most common response” for support frequency and/or duration. As such, supports may fall into more than one category.

Another classroom-level support that did not take a significant amount of time was *sample unit exams*. Of the 82 AP teachers that received *sample unit exams* (see Table 1), 57 responded to the question on duration and almost half (44%) indicated that their total time commitment for receiving this classroom- level support was *less than 15 minutes*. Additionally, this classroom-level support was most often received only once, which indicated that—in addition to this being a low time commitment support—it was also a classroom-level support AP teachers did not receive very often.

Some supports were received frequently, and required a significant time commitment

Respondents reported receiving some of the classroom-level supports often, and noted that they required a significant time commitment. For *instructional coaching*, *content knowledge*, and *knowledge of pedagogical practices*, the most common response for frequency was *5+ times* and the most common response for duration was *more than 3 hours*. Most AP teachers indicated that they have received these classroom-level supports five or more times throughout their engagement with Mi’s program.

One support was received frequently, and did not require a significant time commitment

Finally, *strategies for aligning course assessments to the AP* exam was the only classroom-level support categorized as frequently received with a relatively lower time commitment; as one of the most common responses for frequency was *5+ times* and the most common response for duration was *1–2 hours*.

##### Description of equipment and supplies-related supports

AP teachers were asked to describe the (1) *equipment and supplies* and (2) *knowledge and guidance on textbook, equipment, and resource selections* that they received from Mi’s content directors. For *equipment and supplies*, many AP teachers referenced textbooks that were provided for their AP classroom(s), lab equipment that was provided or loaned for science labs, and calculators, cameras, and other various equipment for AP lessons. For *knowledge and guidance on textbook, equipment, and resource selections*, many AP teachers reported that content directors’ advice on AP resources for their classroom was very helpful. AP teachers also referenced informational emails sent by content directors, mentioning that they were helpful and included important resource information. For a full list of responses, please refer to Appendix D.

#### Means of communication with content directors

The survey prompted respondents to indicate the frequency with which Mi’s content directors communicated with respondents: *daily*, *weekly*, *biweekly*, *monthly*, *less frequently than monthly*, or *I do not communicate with Mi content directors*. *Less frequently than monthly* and *monthly* were the most common responses, as 33% and 29% of respondents selected these response options, respectively.

Figure 9 on the following page summarizes these responses. Mi aims for content directors to communicate with participating teachers at least monthly.

###### Figure 9: Percentage of communication frequency with content directors

Respondents were also prompted to indicate the means of communication through which they corresponded with content directors. As shown in Figure 10 below, *email* was the most common mode of communication, with almost all (92%) respondents selecting this option. *In-person visits to your school/classroom* was the second most common mode of communication, with just under one-fifth of AP teachers (17%) selecting this.

###### Figure 10: Percentage of teachers that utilized various modes to communicate with content directors

Note: These percentages add up to greater than 100% because respondents were permitted to select more than one form of communication.

## Comparison of service provision to expression of need

AP teachers were asked to compare the amount of classroom-level supports provided by Mi’s content directors to their expression of need for the various supports. These questions included: sufficiency of classroom-level supports received, and level of essentialness and need for classroom-level supports.

#### Sufficiency of supports received

Respondents were asked to indicate—through yes/no questions—whether the amount of support provided by Mi’s content directors was sufficient for their needs.12 As illustrated in Figure 11 below, almost all respondents reported that the amount of support provided was sufficient for their needs. This includes three classroom-level supports for which 100% of respondents selected *yes*: *classroom observation for instructional feedback*, *co-teach AP class with content director*, and *assistance in aligning school curriculum across grades 7–12.*

###### Figure 11: Percentage of AP teachers that thought the amount of support provided was sufficient

Classroom observation for instructional feedback Co-teach AP class with content director Align school curriculum across grades 7–12 Content director modeled AP instruction

**100%**

**100%**

**100%**

**98%**

**96%**

**94%**

**93%**

**93%**

**93%**

**93%**

**92%**

**92%**

**91%**

**91%**

**91%**

**90%**

**90%**

**89%**

Instructional coaching Knowledge and guidance on resource selections

Align AP class curriculum to College Board AP curriculum Assistance in learning how AP exams are assessed

Curriculum planning Content knowledge

Assistance with utilizing the Instructional Planning Report

Knowledge of pedagogical practices

Curriculum development Sample unit exams Course design

Equipment and supplies (i.e., textbooks, equipment, etc.) Strategies for aligning course assessments to the AP exam

Feedback on instructional materials

0% 20% 40% 60% 80% 100%

12 Respondents were only shown the sufficiency of supports question if they indicated that they received the support in Question 1.

Of the few AP teachers that indicated the amount of support was not sufficient, most indicated that they were not aware of the classroom-level supports’ availability, or referenced a lack of time to discuss the classroom-level support at the Summer Institute. Both of these references fall outside of the scope of the question evaluating sufficiency of supports received, as this question was limited to classroom- level supports received from content directors through phone, email, newsletter, visits to schools/classrooms, etc. Classroom-level supports received from content directors at the Summer Institute, two-day fall training, and Saturday study session were not covered by this survey.

#### Extent to which supports were considered essential

To gauge participants’ thoughts on how helpful/important each type of support was, all respondents were asked to specify the extent to which each of the 18 classroom-level supports were essential to them as AP teachers. Specifically, respondents were asked the following question:

“*Please indicate the extent to which each type of support provided by Mass Insight is essential for helping you as an AP teacher, with the ultimate aim of helping promote the AP STEM and English program’s goals. As a reference, the program goals include:*

1. *Increase student participation and performance in AP STEM and English courses and exams, particularly among historically underserved populations,*
2. *Increase equity and access to AP STEM and English courses and exams,*
3. *Create a college-going culture among the entire school community in which all students believe that they can have a great future, characterized by students having an appreciation of academics, a desire to succeed, and a drive to attend college and become a lifelong learner, and*

4. *Increase the share of students who matriculate, persist, and graduate from college*.”

The extent to which AP teachers considered classroom-level supports as essential was measured on a four-point scale, where 1 = *not at all*, 2 = *to a small extent*, 3 = *to a moderate extent*, and 4 = *to a great extent*. Two parallel analyses were conducted to compare the amount of support provided by content directors to AP teachers’ expression of support essentialness. The first evaluated essentialness for AP teachers that requested the classroom-level support, while the second evaluated the same for AP teachers that did not request the classroom-level support.13

Results showed that the extent to which AP teachers considered classroom-level supports as essential was associated with whether the respondents requested the support. Respondents who requested the classroom-level support were more likely to note the extent of essentialness as *to a great extent* or *to a moderate extent*. In fact, *to a great extent* was the most common response for AP teachers that requested the support—for 13 of the 18 classroom-level supports. In contrast, respondents that did not

13 “Requested” was defined as selecting “yes” to the question *did you request this support* in Question 1.

request the classroom-level support were more likely to report similar percentages across the four-point scale. Further, of the respondents that indicated that classroom-level supports were *not at all* essential, the majority of these respondents did not request the support. Figure 12 below contrasts the response choices for respondents who did request each classroom-level support with those who did not.

###### Figure 12: Whether the support was requested by extent to which each support is considered essential for helping respondents as an AP teacher 14

|  | *Not at all* | | *To a small extent* | | *To a moderate extent* | *To a great extent* |
| --- | --- | --- | --- | --- | --- | --- |
| **Assistance in learning how AP exams are assessed** | | | | | | |
| Requested support (n=71)  Did not request support (n=101) | |  | | | | |
| **Equipment and supplies** | | | | | | |
| Requested support (n=67)  Did not request support (n=108) | |  | | | | |
| **Knowledge and guidance on textbook, equipment, and resource selections** | | | | | | |
| Requested support (n=60)  Did not request support (n=115) | |  | | | | |
|  | | *Not at all* | | *To a small extent* | *To a moderate extent* | *To a great extent* |

14 N in Figure 12 represents the number of respondents that selected a response for each classroom-level support. Additionally, bubble sizes are representative of the percentages for scale points within each classroom-level support, and should not be compared across supports.

|  |  |  |  |
| --- | --- | --- | --- |
| ***Not at all*** | ***To a small extent*** | ***To a moderate extent*** | ***To a great extent*** |
| **Sample unit exams** | | | |

**7%**

**15%**

**15%**

**63%**

Requested support (n=59)

Did not request support (n=109)

**22%**

**20%**

**27%**

**31%**

**Instructional coaching**

Requested support (n=58)

**16%**

**41%**

**43%**

Did not request support (n=121)

**27%**

**30%**

**23%**

**20%**

**Content knowledge**



**3%**

**10%**

**38%**

**48%**

Requested support (n=58)

Did not request support (n=115)

**19%**

**28%**

**26%**

**27%**

**Content director modeled AP instruction**

**6%**

**17%**

**25%**

**52%**

Requested support (n=52)

**9%**

**39%**

**31%**

**21%**

Did not request support (n=119)

**Curriculum planning**

Requested support (n=51)



**4%**

**8%**

**47%**

**41%**

**20%**

**23%**

**31%**

**26%**

Did not request support (n=125)

|  |  |  |
| --- | --- | --- |
| *Not at all To a small extent* | *To a moderate extent* | *To a great extent* |

|  |  |  |  |
| --- | --- | --- | --- |
| *Not at all* | *To a small extent* | *To a moderate extent* | *To a great extent* |
| **Feedback on instructional materials** | | | |

**6%**

**14%**

**41%**

**39%**

Requested support (n=49)

**26%**

**33%**

**29%**

**13%**

Did not request support (n=123)

**Strategies for aligning course assessments to the AP exam**

**4%**

Requested support (n=46)

Did not request support (n=126)

**22%**

**20%**

**30%**

**28%**

**15% 37% 44%**

**Curriculum development**

**14%**

**43%**

**43%**

Requested support (n=44)

Did not request support (n=130)

**22%**

**25%**

**29%**

**25%**

**Knowledge of pedagogical practices**

**11%**

**50%**

**39%**

Requested support (n=44)

Did not request support (n=129)

**18%**

**33%**

**30%**

**19%**

**Course design**

**12%**

**39%**

**49%**

Requested support (n=41)

Did not request support (n=135)

**22%**

**26%**

**27%**

**26%**

|  |  |  |
| --- | --- | --- |
| *Not at all To a small extent* | *To a moderate extent* | *To a great extent* |

|  |  |  |  |
| --- | --- | --- | --- |
| ***Not at all*** | ***To a small extent*** | ***To a moderate extent*** | ***To a great extent*** |
| **Co-teach AP class with content director** | | | |

Requested support (n=38)



**3%**

**18%**

**24%**

**55%**



**6%**

**50%**

**29%**

**15%**

Did not request support (n=137)

**Assistance in aligning AP class curriculum to the College Board AP curriculum**

Requested support (n=38)

**8%**

**18%**

**37%**

**37%**

Did not request support (n=136)

**28%**

**24%**

**29%**

**18%**

**Assistance with utilizing the Instructional Planning Report**

**14%**

**21%**

**39%**

**25%**

Requested support (n=28)

Did not request support (n=141)

**29%**

**28%**

**23%**

**20%**

**Classroom observation for instructional feedback**

Requested support (n=27)



**4%**

**26%**

**26%**

**44%**

**10%**

**39%**

**34%**

**17%**

Did not request support (n=144)

**Assistance in aligning school curriculum across grades 7–12**

Requested support (n=11)

**9%**

**18%**

**46%**

**27%**

Did not request support (n=161)

**41%**

**21%**

**21%**

**17%**

|  |  |  |
| --- | --- | --- |
| *Not at all To a small extent* | *To a moderate extent* | *To a great extent* |

As illustrated in Figure 12, many AP teachers who requested the classroom-level support indicated that it was essential to their AP classroom *to a great extent*. More than half of respondents selected *to a great extent* for *equipment and supplies* (63%), *sample unit exams* (63%), *co-teach AP class with content director* (55%), and *content director modeled AP instruction* (52%). Notable classroom-level supports with substantial portions of AP teachers who selected *to a great extent* included: *course design* (49%), *content knowledge* (48%), and *assistance in learning how AP exams are assessed* (45%).

#### Extent to which supports were considered needed

To gauge how much additional assistance or help AP teachers required, all respondents were asked to reflect on the extent to which each of the 18 classroom-level supports was needed in their classroom. Specifically, respondents were asked the following question:

*“Reflecting upon your classroom practices and students’ needs, please indicate the extent to which you need support in the listed areas.”*

The extent to which each support was needed was assessed on a four-point scale, where 1 = *no need*, 2

= *low need*, 3 = *moderate need*, and 4 = *high need*. Again, two parallel analyses were conducted to compare the amount of support provided by content directors to AP teachers’ expression of support need. The first evaluated the level of need for AP teachers who requested the support, while the second evaluated the same for AP teachers who did not request the support.15

In general, results showed that the extent to which each classroom-level support was needed was associated with whether the respondents requested the support. Respondents who requested the classroom-level support were most likely to select *moderate need*—this was the most common response for 12 of the 18 classroom-level supports. For respondents who did not request the classroom-level support, *low need* was the most common response for 14 supports. Considering the respondents who indicated *no need* for classroom-level supports, most respondents who selected this option did not request the support from Mi’s content directors (16%–40%, mean = 28%; as compared to 4%–36%, mean = 12% for respondents that made the request). Finally, a modest percentage of respondents reported a *high need* for classroom-level supports. Overall, AP teachers were more likely to indicate *high need* for a classroom-level support if they requested the support, in comparison to AP teachers that did not request the support. The range of *high need* for classroom-level supports when respondents did not make the request spanned from 1% to 19% (mean = 8%) compared to 2% to 35% (mean = 13%) of those who did request the support. It is worth noting that a few classroom-level supports had approximately one- quarter or more respondents (who requested the support) indicate that there was a *high need*. These classroom-level supports included: *equipment and supplies* (35%), *sample unit exams* (33%), *content director modeled AP instruction* (25%), and *strategies for aligning course assessments to the AP exam* (22%).

15 Requested was defined as selecting “yes” to *did you request this support* in Question 1

Figure 13 below contrasts the response choices for respondents who did or did not request each classroom-level support.

###### Figure 13: Whether the support was requested by extent to which each support is considered needed by teachers16

|  |  |  |  |
| --- | --- | --- | --- |
| ***No need*** | ***Low need*** | ***Moderate need*** | ***High need*** |
| **Assistance in learning how AP exams are assessed** | | | |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Requested support (n=72) | **18%** | **29%** | **39%** | **14%** |
| Did not request support (n=103) | **26%** | **39%** | **33%** | **2%** |

**Equipment and supplies**



Requested support (n=66)

**6%**

**20%**

**39%**

**35%**

**16%**

**24%**

**41%**

**19%**

Did not request support (n=109)

**Knowledge and guidance on textbook, equipment, and resource selections**

**8%**

**15%**

**32%**

**45%**

Requested support (n=60)

**8%**

**24%**

**44%**

**25%**

Did not request support (n=115)

**Sample unit exams**

Requested support (n=60)

**7%**

**28%**

**32%**

**33%**

**17%**

**31%**

**34%**

**18%**

Did not request support (n=111)

*No need Low need Moderate need High need*

16 N in Figure 13 represents the number of respondents that selected a response for each support. Additionally, bubble sizes are representative of the percentages for scale points within each support, and should not be compared across supports.

|  |  |  |  |
| --- | --- | --- | --- |
| ***No need*** | ***Low need*** | ***Moderate need*** | ***High need*** |
| **Instructional coaching** | | | |

Requested support (n=58)



**9%**

**2%**

**55% 35%**



**4%**

**28%**

**53%**

**15%**

Did not request support (n=123)

**Content knowledge**

Requested support (n=58)



**10%**

**5%**

**52% 33%**



**1%**

**37%**

**44%**

**17%**

Did not request support (n=115)

**Content director modeled AP instruction**

Requested support (n=52)

**8%**

**25%**

**42%**

**25%**

Did not request support (n=120)



**2%**

**38%**

**38%**

**22%**

**Curriculum planning**

**12%**

**8%**

**34% 46%**

Requested support (n=50)

**10%**

**25%**

**38%**

**28%**

Did not request support (n=125)

**Feedback on instructional materials**

Requested support (n=50)



**6%**

**4%**

**40% 50%**

**9%**

**25%**

**38%**

**28%**

Did not request support (n=124)

*No need Low need Moderate need High need*

|  |  |  |  |
| --- | --- | --- | --- |
| *No need* | *Low need* | *Moderate need* | *High need* |
| **Strategies for aligning course assessments to the AP exam** | | | |

Requested support (n=46)

**9%**

**30%**

**39%**

**22%**

Did not request support (n=127)

**21%**

**32%**

**33%**

**14%**

**Knowledge of pedagogical practices**

Requested support (n=45)



**4%**

**2%**

**40% 53%**



**4%**

**26%**

**48%**

**22%**

Did not request support (n=130)

**Curriculum development**

Requested support (n=44)

**7%**

**7%**

**36% 50%**

**11%**

**26%**

**42%**

**22%**

Did not request support (n=130)

**Course design**

**10%**

**12%**

**32% 46%**

Requested support (n=41)

**6%**

**28%**

**44%**

**22%**

Did not request support (n=135)

**Assistance in aligning AP class curriculum to the College Board AP curriculum**

**5%**

**21%**

**40%**

**34%**

Requested support (n=38)

**6%**

**31%**

**41%**

**22%**

Did not request support (n=137)

*No need Low need Moderate need High need*

|  |  |  |  |
| --- | --- | --- | --- |
| *No need* | *Low need* | *Moderate need* | *High need* |
| **Co-teach AP class with content director** | | | |

**8%**

**11%**

**32% 49%**

Requested support (n=37)



**1%**

**40%**

**42%**

**17%**

Did not request support (n=138)

**Assistance with utilizing the Instructional Planning Report**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Requested support (n=28) | **18%** | **32%** | **36%** | **14%** |
| Did not request support (n=141) | **26%** | **39%** | **27%** | **8%** |

**Classroom observation for instructional feedback**

**7%**

**7%**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Requested support (n=27) |  | **44%** | **41%** |  |
| Did not request support (n=145) | **35%** | **45%** | **17%** | **3%** |

**Assistance in aligning school curriculum across grades 7–12**



Requested support (n=11)

**36%**

**18%**

**27%**

**18%**

Did not request support (n=163)

**29%**

**28%**

**27%**

**16%**

*No need Low need Moderate need High need*

## Comparison of service provision to ideal program administration

This section summarizes efforts to assess the extent to which a subset of AP STEM and English program activities—classroom-level supports provided by Mi content directors—were implemented with fidelity. To assess fidelity of implementation, the percentage of teachers who reported receiving each type of classroom-level support offered by Mi’s content directors was compared to the activities section of the program summary—specifically, the notation of whether supports were considered essential or optional.

As a first and necessary step to assessing fidelity, UMDI developed a program summary (Appendix A). The summary outlined the intended inputs, activities, outcomes, and goals of the program, with important notations for most activities regarding the extent to which each was deemed essential to the program by Mi.17 Additionally, for some outputs described, recommended dosages per teacher or school were specified.

After the program summary was finalized, the activities section of the program summary was used to develop the teacher feedback survey. One question in the survey specifically asked AP teachers if they had ever received each of the 18 classroom-level supports provided by Mi content directors (survey question 1c). This question aligned well with the qualifier developed in the activities section of the program summary, indicating whether each type of support was essential or optional to the program. Please see the Methods section of the report for more information about the survey development process.

It was anticipated that the support types that Mi indicated were essential—as noted in the activities section of the program summary—would have relatively high rates of take-up among participating AP teachers—as indicated through AP teacher responses to the teacher feedback survey. However, this was not the case. As reflected in the activities section of the program summary, each of the classroom-level supports measured through the teacher feedback survey were considered essential by Mi (see column two in Table 4).18 Yet, the most frequently received support was *assistance in learning how AP exams are assessed,* with 53% of AP teachers reporting that they received that classroom-level support (see Table 4). The next most frequently received classroom-level supports were *sample unit exams* (49%)*, equipment and supplies* (45%)*, and curriculum planning* (45%)*.* Eleven classroom-level support types were received by less than 40% of AP teachers, and five classroom-level support types were received by less than 30% of AP teachers. The five least-frequently-received classroom-level supports were

17 DESE does not require implementation of most items in the summary (or in our phrasing, consider items to be “essential”), and individual schools or a subset of teachers within schools may view certain activities as optional (especially if school administrators or staff deem the activity to be as less of a need). Instead, the decision to categorize an item as essential rests with Mi as a means to advance the overall goals of the program and to meet performance measures/agreements between Mi and the Commonwealth.

18 One support—*assistance in aligning AP class curriculum to the College Board AP curriculum*—is not listed in the activities section of the program summary. This classroom-level support was added per DESE’s request. It is listed as essential in Table 4 because DESE and Mi agree that it is an important part of the AP STEM and English program.

*assistance in aligning AP class curriculum to the College Board AP curriculum* (29% of responding teachers ever received assistance), *co-teach AP class with content director* (25%), *assistance with utilizing the Instructional Planning Report* (25%), *classroom observation for instructional feedback* (20%), and *assistance in aligning curriculum across grades 7–12* (9%).

In addition to the reported take-up rate by AP teachers for classroom-level supports ranging between 9% and 53%, it is also worth noting that between one- to two-thirds of AP teachers indicated that each of the classroom-level supports offered by content directors was essential *to a small extent* or *not at all* (see Appendix E).

Further, Table 4 shows the percentage AP teacher respondents who *ever received* each type of classroom-level support from Mi, not the percentage of AP teacher respondents who may have received the recommended dosage of each classroom-level support in recurring years. For many of the teacher supports provided at the classroom level by Mi-content directors, a plurality of AP teachers who reported receiving a classroom-level support received that support one time (please see Table 2 in the findings section above for a full presentation of the number of times AP teachers received each support type). For example, of the 53% of respondents who reported ever receiving *assistance in learning how AP exams are assessed*, almost half (44%) received assistance in this area one time. Interestingly, despite a plurality of AP teachers receiving supports only one time, an overwhelming majority—between 89% and 100%—of AP teachers responding to the survey who received each classroom-level support type indicated that the amount of support provided by Mi was sufficient (see Figure 11).

In conclusion, the findings noted within this section may indicate incongruent views on whether these classroom-level supports are essential, given that:

* Mi designated the classroom-level supports offered by content directors as essential, rather than optional, according to the activities section of the program summary.
* Despite each of these supports being deemed as essential, the reported take-up rate by AP teachers for classroom-level supports ranged between 9% and 53%.
* Between one- and two-thirds of all AP teacher respondents indicated that each of the classroom-level supports offered by content directors was essential *to a small extent* or *not at all* (see Appendix E).

###### Table 4: Whether each type of support is essential by the share of teachers ever receiving it

|  |  |  |  |
| --- | --- | --- | --- |
| **Support** | **Is the support essential or optional?** | **For which schools is the support essential or optional1** | **Receipt of the teacher supports offered by content directors** |
| Assistance in learning how AP exams are assessed | essential | all | 53% |
| Sample unit exams | essential, teachers optional | all | 49% |
| Equipment and supplies (i.e., textbooks, equipment, etc.) | essential | core | 45% |
| Curriculum planning | essential | all | 45% |
| Content knowledge | essential | all | 44% |
| Instructional coaching | essential, teachers optional | core | 43% |
| Knowledge and guidance on textbook, equipment, and resource selections | essential | core | 42% |
| Knowledge of pedagogical practices | essential | all | 39% |
| Strategies for aligning course assessments to the AP exam | essential, teachers optional | all | 38% |
| Curriculum development | essential, teachers optional | core | 37% |
| Feedback on instructional materials | essential | all | 35% |
| Content director modeled AP instruction | essential | all | 34% |
| Course design | essential, teachers optional | core | 34% |
| Assistance in aligning AP class curriculum to the College Board AP curriculum | essential | core | 29% |
| Co-teach AP class with content director | essential | all | 25% |
| Assistance with utilizing the Instructional Planning Report | essential | all | 25% |
| Classroom observation for instructional feedback | essential | all | 20% |
| Assistance in aligning school curriculum across grades 7–12 | essential | all | 9% |

1 For supports that distinguish service provision by schools in core vs. sustaining status, content directors offer similar mentoring and coaching supports but generally focus attention on new AP STEM and English teachers and content areas where AP data reveals more needed support.

## Conclusion

The findings from this section of the report spoke to the ways in which, and the extent to which, the AP STEM and English program is being implemented as intended. To summarize these findings by section:

1. **Teachers’ expression of need for support activities:** In general, AP teachers were knowledgeable about classroom-level support availability, although less than half requested each of the classroom-level supports evaluated. The take-up and time spent receiving content directors’ supports varied by the classroom-level support in question, as some required more time to receive, and others were received more often. This suggests that AP teachers need these supports more often. Email was the most common form of communication with content directors, and most AP teachers received communication from their content directors monthly or less frequently.
2. **Comparison of service provision to teachers’ expression of need:** Respondents were satisfied with the amount of classroom-level support provided by content directors. The extent to which AP teachers identified classroom-level supports as essential, and the extent to which AP teachers identified classroom-level supports as needed, varied by whether AP teachers requested a support. Generally, AP teachers who requested the classroom-level support were more likely to report a higher level of essentialness, or a higher level of need, than AP teachers who did not request the support.
3. **Comparison of service provision to ideal program administration:** Given that Mi described AP teacher participation in the classroom-level support activities as essential to the program, low reported rates of take up for all classroom-level supports (no more than roughly half of AP teachers reported ever receiving assistance in even the most-frequently-used areas) suggests the fidelity of implementation is below, and potentially well below, Mi’s vision of ideal program implementation, as described in the activities section of the program summary.

# Comparing Survey Data to Data Provided by Mi

In this section we compare the participation data reported by AP teachers through the teacher feedback survey to the service delivery data reported by Mi. The purpose of this activity was to triangulate/validate schools’ level of engagement with Mi content directors, as reported by AP teachers in the teacher feedback survey, to available data records on schools’ engagement with the program, as recorded by Mi’s content directors.

This section is organized as followed:

1. Process for identifying appropriate schools for comparison
2. Comparison of level of engagement
3. Trends identified during the data analysis

## Process for identifying appropriate schools for comparison

UMDI’s ability to compare levels of engagement was hampered by differences in the two data sources (as noted below), and the limited data provided by Mi. Mi ultimately provided data on the approximate number of interactions between content directors and each participating school in the core program during the 2017–18 school year, the most recently completed school year for which such records might possibly be available.19 Twenty-five schools fit this criteria.20

Given that the teacher survey included 82 schools—those in both core and sustaining status—the study team developed a procedure for comparing both data sources as comprehensively as possible. As a first filter, UMDI pulled survey data for the 25 schools for which Mi provided data. Next, UMDI removed records for two schools in the Mi-provided data that were not included in the teacher feedback survey (one school dropped out of the program mid-year and the other did not elect to continue in the sustaining component), leaving both lists at 23 schools—all in the core program.

Next, the study team adjusted the list of schools to remove from consideration those that transitioned to sustaining status during the 2018–19 school year. This was necessary since some schools included in the Mi-provided data, which was restricted to core schools in the 2017–18 school year, may have shifted to the sustaining program during the 2018–19 school year corresponding to the survey period. After

19 As indicated previously, the evaluation team amended their original data request to match the data available from Mass Insight. UMDI asked Mi if it would be possible to obtain a record of interactions with participating schools—by year— beginning in 2011 as well as by type of support. Mi indicated that they could only provide that data for 2017–2018.

20 UMDI requested a log of all interactions for both Core and Sustaining schools. However, Mi only maintained a record of interactions with core schools during school year 2017–18.

removing schools that transitioned to sustaining status, the universe of schools for this comparison stood at 15.

Finally, several schools only had one or fewer AP teachers respond to the survey. These schools were also removed from the final list because UMDI did not want to base an estimated level of school engagement with Mi activity on a single survey response. The final list considered for comparison included nine schools:

* Ayer Shirley Regional High School
* Diman Regional Vocational Technical High School
* Doherty Memorial High School
* Grafton High School
* Haverhill High School
* Joseph P. Keefe Regional Technical School
* Lowell High School
* Pathfinder Regional Vocational Technical High School
* Tri-County Regional Vocational Technical High School.

Data collected from these nine schools served as the basis for cross-referencing the levels of engagement with the AP STEM and English program between the Mi data and the teacher feedback survey data. However, it is unclear if the final list of schools was a representative sample of the universe of schools that were originally considered for comparison (82 schools). As such, please refer to Appendix F for the analyses and results that compared level of engagement for the Mi data to the survey data.

# Strategic Considerations

The fidelity study—including the teacher survey and other related evaluation efforts—was conducted to assess the ways and extent to which the program was implemented as intended. The study also provided insight about how frequently teachers expressed a need for services, and also, if the services provided by Mi matched these needs. Through this work, several points for consideration emerged that could improve the administration of the program and students’ and schools’ experiences with it:

* **Mi could consider communicating with increased emphasis the importance and utility of the classroom-level supports provided by content directors. Survey findings indicate that a majority of AP teachers were knowledgeable about support availability.** However, less than half of teachers requested each of the classroom-level supports evaluated despite Mi describing all of these as essential to the program. At least in part, these results may be explained by some of the following:
  + Some teachers may not have understood the role of these supports in intervention and/or how the supports could aid their own efforts;
  + Some teachers may have been constrained by their busy schedules, and did not have time to engage with content directors to receive supports; and/or
  + Some teachers may not have been interested in the supports offered by the content directors (i.e., they may not have considered the supports to be essential for their work).21
* **Mi could consider expanding administrative processes to proactively assess or survey teachers’ need for supports, or develop standards for which content directors must offer services to teachers**. On the former point, Mi could regularly ask teachers which services are needed that they are not receiving (Mi has already proposed the latter—in part—through UMDI’s work of facilitating an updated conceptualization of the program theory elements.)
* **DESE and Mi could consider communicating with greater emphasis that the program is not meant to wholly substitute for other AP teacher training and support opportunities (e.g., training sessions offered by the College Board).** Some teachers may require more support than is available through the program. While almost all teachers reported that the amount of each support provided by Mi was sufficient for their needs, a few supports had larger shares of teachers who requested the support indicate there was a high need for those supports. For example, 35% of teachers who requested *equipment and supplies* indicated there was a high need; other supports identified by AP teachers as high need included *sample unit exams* (33%), *content director modeled AP instruction* (25%), and *strategies for aligning course assessments to*

21 Presently, the program lacks the means to require teachers to participate.

*the AP exam* (22%). The relatively high share of teachers who requested supports in these areas indicating they had a high need may indicate that service provision for these support topics requires more resources than what is available through the AP STEM and English program, especially given that virtually all requests for assistance were fulfilled by Mi. This recommendation is congruent with results from the Year 6 evaluation, during which administrators and teachers reported that the AP STEM and English program was the primary vehicle for AP teacher training and professional development.

* **Mi, in collaboration with DESE, could consider further aligning program activities with descriptions of work in future bid responses.** A component of this year’s evaluation required the study team to compare program activities as proposed by Mi in the most-recent COMMBUYS bid response to a description of activities developed by UMDI in collaboration with Mi and DESE (the program summary). In several cases, the study team observed apparent incongruities between the work that was proposed and Mi’s description of an ideal implementation of on-the-ground activities (a couple of which went beyond classroom-level teacher supports), summarized as follows:
  + Planning for increasing the number of AP courses offered. The bid response states that Mi staff will work with leaders of newly participating schools to develop a three-year plan for increasing the number of AP courses offered at each school. According to the current description of work, schools sign up for the program one year at a time, and every year Mi works with administrators to develop a new written agreement. Mi works with schools to expand the program on a by-year basis.
  + Walkthrough observation tool. The bid response states that Mi will develop a walkthrough observation tool to help define components/factors to look for in a high quality, rigorous AP class. In feedback provided on the program summary, Mi stated that content directors do not do any walkthroughs or similar work because these activities are viewed as evaluative, not supportive, of teachers.
  + Administrator collaboration. The bid response states that, for districts with more than one program school, Mi will convene administrators to discuss access and equity issues and identify strategies to increase the AP participation of historically underserved students. In a current description of their work, Mi staff said they do not convene administrators from these districts, although the administrators do communicate.
  + Vertical alignment. The bid response cites vertical alignment frequently, indicating to the study team that this focus is intended to be a highlight or more involved component of the program. According to the current description of work, Mi invites teachers from grades 7–12 to participate in the “Fundamentals in AP” summer institute, and content directors indicated that they will work with teachers in lower grades, if they are requested to do so. However, the study team’s understanding of service provision is that these types of interactions happen infrequently.
* **Mi could consider augmenting the data it collects, and its processes for managing existing data.** Mi had some challenges in providing information to the study team about the nature and frequency of content directors’ interactions with teachers at participating schools. Several aspects of Mi’s administrative processes for record keeping support a potential recommendation for a renewed focus on data collection and administration—depending on Mi (and DESE) priorities:
  + Basic service delivery data is logged in a Google Sheet that relies on content directors reporting support(s) provided to teachers, and in some cases, is filled out retroactively, creating the possibility that some interactions are unreported (or alternatively, inaccurately reported—e.g., under- or over-reported).
  + Absent a process of review, it is possible that individual content directors may enter information inconsistently.
  + For the 2017–18 school year, Mi tracked interactions with schools by subject area. Mi did not track the type of support that was offered during those interactions, or the teachers who received the support. For the years prior to school year 2017–18, Mi was unable to efficiently provide data on basic service delivery to schools, and reported that records of interactions with teachers from at least one previous school year (2016–17) were not available.
* The Year 7 evaluation focused on assessing the fidelity of a relatively targeted component of the AP STEM and English program—classroom-level supports provided to teachers by Mi content directors. These supports were an important part of the program. **If further assessments of fidelity are conducted, DESE and Mi could consider prioritizing the following: services provided through the AP Summer Institute, fall two-day training, student regional study sessions, and student mock exams.**

# Appendix A

### Summary of Key Program Elements – AP STEM and English Program

Year 7 evaluation (step 1)

This document presents a summary description of the Advanced Placement STEM and English program. It is organized by program theory topic and includes descriptions of goals, inputs, activities, outputs, and short and long-term outcomes. UMDI drafted the summary from a review of key documents submitted by the Department of Elementary and Secondary Education (DESE) and Mass Insight Education (MIE), which also included a review and synthesis of publicly available information. UMDI, in consultation with DESE and MIE, refined the summary through an iterative process that included:

* Initial phone conversations separately with DESE and MIE to hear reactions to an initial program summary draft.
* DESE and MIE responses to 1) a web-based survey attempting to more precisely document aspects of the program’s inputs, activities, and outputs (e.g., which aspects of the intervention are essential/optional, to which schools if there is a distinction, and in the outputs section, minimum/recommended dosage; and 2) a Word document outlining the program’s goals, outcomes, and impacts.
* DESE, MIE, and UMDI completed an in-person review to discuss areas of less agreement from earlier review.

MIE has identified most items in this summary as “essential” or “optional”. Some elements are identified as essential for only core or sustaining schools. When available, recommended and/or minimum dosages are specified. It is important to note that DESE does not require implementation of most items in this summary (or in our phrasing, consider items to be “essential”), and individual schools or a subset of teachers within schools may view certain activities as optional (especially if school administrators or staff deem it as less of a need). Instead, a decision to categorize an item as essential rests with MIE as a means to advance the overall goals of the program and to meet performance measures/agreements between MIE and the commonwealth. For the minority of items DESE did identify as required/essential (almost always in conjunction with MIE), we have made this distinction by bolding the term “essential”.

### Goals

Goal: state of affairs that could realistically be attained as a result of program actions—relates to the overall mission of the program and typically is stated in broad and rather abstract terms

* 1. Increase student participation and performance in AP STEM and English courses22 and on Advanced Placement STEM and English exams, particularly among historically underserved populations (MIE bid response); intended population: low income, diverse, and minority students.
  2. Increase equity and access to AP STEM and English AP courses and AP STEM and English exams.
  3. To create a school culture in which teachers have high expectations for students and believe that all students can achieve, where policies and procedures are in place and acted upon to identify and enroll previously underserved students in college preparatory classes (including AP).
  4. Increase the share of students who matriculate, persist, and graduate from college.

### Inputs

Inputs: resources and constraints applicable to the program

1. DESE-provided inputs
   1. Financial: DESE provides funding for the project.
   2. Staff time: DESE staff provide time to assist with project planning and the evaluation.
2. MIE-provided inputs
   1. Financial: Through funding provided by DESE, MIE provides financial assistance for several program components, including:
      1. AP exam. MIE will:
         1. In FY17-18, MIE began providing exam fee subsidy assistance to all economically disadvantaged students at core and sustaining schools. **(essential)**
         2. Provide approximately $49 to cover all but $5 of the exam fee. MIE has budgeted $300,000 for exam fee subsidies for economically disadvantaged students at all participating schools.
      2. Equipment and supplies. MIE will:
         1. Provide funding to core schools for instructional resources, such as instructional resources, calculators, and science equipment resources for labs. (essential)
      3. Professional development. MIE will:
         1. Provide funding for some aspects of professional development for AP teachers, including tuition/fees for the summer institute—for any two of the three years in core status—and the two-day fall training—while the school is in core status. (essential)

22 Throughout this document, references to the AP STEM and English program include computer science classes since these classes are considered part of the AP math curriculum.

* + - 1. Provide funding for facilities, rentals fees, instructor fees, travel, materials, staff time, etc. for professional development trainings. (essential)
    1. Teacher stipends. MIE will:
       1. Provide teacher stipends to account for participating AP STEM and English teachers’ time for the summer institutes (essential), two-day fall trainings (optional), and the Saturday study sessions (essential). Teacher stipends are provided to AP STEM and English teachers in both core and sustaining schools.
       2. Provide stipends to lead AP teachers to account for the time they spend preparing for and traveling to other schools to offer assistance. (essential)
    2. Student supports. MIE will:
       1. Provide funds to support the Saturday study sessions and mock exams. (essential) These funds support staff time and travel, incentives (snacks, gift cards, and raffles tickets for prizes, such as an iPad mini) to encourage student participation, and resources and materials.
    3. Content directors. MIE will:
       1. Provide funding for content directors to travel; account for their time to attend and prepare materials for parent nights, meet with school committees, superintendents, educational leaders, AP STEM and English teachers, and guidance counselors; and work with schools to eliminate barriers to AP courses, support AP STEM and English teachers and curriculum alignment, etc. (essential)
    4. Other. MIE will:
       1. Provide funding for various other things, including but not limited to:
          1. Administrative support (essential)
          2. Developing and piloting implementation reviews (essential)
          3. Developing tools to increase educator effectiveness (essential)
    5. Outside funding. MIE will:
       1. Provide $1,000,000 in outside funding in addition to those provided by DESE. **(essential)**
  1. Staff time: As indicated in the financial section, staff time was a valuable resource provided by MIE.
     1. Content directors. MIE’s content directors will dedicate time to increase student participation and performance in AP STEM and English courses and on AP STEM and English exams.
        1. Their time helped:
           1. Schools to set goals for enrollment and performance growth (essential, core schools)
           2. Create or expand access to AP STEM and English courses for students (essential, core schools)
           3. School staff to identify potential AP STEM and English students (essential, all schools)
           4. Find and bring essential equipment and supplies to AP STEM and English classrooms (essential, all schools)
           5. Organize Saturday study sessions (essential, all schools)
           6. Organize mock exams (essential, all schools)
           7. Hold professional development trainings for AP teachers; this includes training through the summer institute and fall trainings as well as throughout the year by modeling lessons or by providing resources (essential, all schools)
           8. AP STEM and English teachers increase AP STEM and English student participation in the Saturday study sessions (essential, all schools)
           9. Recruit and offer support to lead AP teachers (essential, all schools)
           10. Coach and monitor teacher effectiveness and fidelity in implementing AP STEM and English courses (optional, all schools)
           11. Align school curriculum (optional, all schools)
     2. Key project staff: Key project staff will dedicate time to meet with DESE and the project evaluation team.
  2. In-kind
     1. MIE will:
        1. Provide textbooks, handouts, and other equipment to school administrators and AP STEM and English teachers. (optional, all schools)
        2. Provide handouts and other miscellaneous things to AP STEM and English teachers who attend the professional development trainings. (optional, all schools)
        3. Provide incentives (snacks, gift cards, and raffles tickets for prizes, such as an iPad mini) to encourage AP STEM and English students to attend the Saturday study sessions. (essential, all schools)
        4. Offer graduate level credit from Bridgewater State University for summer institute attendance to AP teachers who are interested in paying an additional fee and submit pieces of work for review by certified instructors. (essential, all schools)

1. School/district-provided inputs
   1. Staff time
      1. Administrators will work with content directors on:
         1. Curriculum alignment (optional, all schools)
         2. Improving AP STEM and English participation and performance (essential, core schools)
         3. Kickoff events (essential, all schools)
      2. AP STEM and English teachers will provide time for:
         1. Opening access to AP to all students (essential, core schools)
         2. Identify potential AP STEM and English students (essential, core schools)
         3. Meet with content directors (essential, core schools)
         4. Attend professional development trainings (essential, core schools)
         5. Attend Saturday study sessions with students (essential, all schools)
      3. In addition to time provided as an AP STEM and English teacher, lead AP teachers will provide time to prepare for, travel to, and work with other schools in the region to help improve their AP STEM and English courses. (optional, core schools.) Lead AP teachers spend time to work with content directors for support. (essential, core schools)
   2. In-kind:
      1. AP STEM and English teachers provide incentives (exemption from a quiz or exam, homework passes, etc.) to students to increase participation at Saturday study sessions. (optional, all schools.) These incentives are sometimes created with the assistance of the content directors.

### Activities

Activities: Services the program is expected to provide

1. School partner support activities
   1. MIE will help schools increase student participation and improve performance in AP STEM and English courses and exams, particularly for economically disadvantaged and underrepresented minority students.
      1. Educate district stakeholders about issues of equity and eliminating barriers to AP STEM and English course and AP STEM and English exam access. (essential, core schools, MIE initiates)
      2. Provide direct outreach and support to AP STEM and English students to encourage participation and strengthen preparation for AP exams. (essential, core schools, MIE initiates)
      3. Work closely with guidance counselors and AP STEM and English teachers to promote AP STEM and English courses and encourage enrollment to all students. (essential, core schools, MIE initiates)
         1. Open enrollment to AP is required by MIE.
         2. MIE works with school staff to encourage student enrollment through: (essential as an overall item—specific sub-items below may or may not be considered essential, depending on the school’s needs, core schools, MIE initiates)
            1. Making classroom visits
            2. Attending school committee meetings (usually occurs when on- boarding new schools; if schools are applying to stay in the program as a sustaining school and are interested in MIE presenting to the school committee, the school must request the presentation)
            3. Organizing AP nights to share the importance and value of AP course work with parents and families
            4. Meeting with groups of students identified by guidance counselors
            5. Identifying students who can handle AP work but might not otherwise be encouraged to enroll
            6. Working with schools to hold AP kickoff events
      4. Work with CORE schools to:
         1. Identify groups of students, AP STEM and English teachers, or AP STEM and English subject areas that need more attention to increase the number of students taking AP exams (essential, core schools, MIE initiates)
         2. Discuss possible adjustments in course offerings and sequence to ensure greater access for underserved students (essential, all schools, MIE initiates)
         3. Discuss schools’ and AP STEM and English teachers’ goals for the upcoming year and expansion of the AP STEM and English program (essential, core schools, MIE initiates)
      5. Administrators across the district (in schools that have more than one high school participating) communicate, sometimes through the central office, to discuss access and equity issues and identify strategies to increase the AP participation of historically underserved students. (essential, core schools, MIE initiates)
   2. MIE will help schools provide new and/or additional AP STEM and English courses.
      1. At currently participating core schools, meet with administrators, guidance counselors, and department chairs during the annual program reviews to discuss possible additions and adjustments in AP course offerings and sequence to ensure greater access for underserved students. (essential, core schools, MIE initiates)
   3. MIE will provide equipment and supplies funding (essential, core schools, MIE initiates), as well as knowledge and guidance on current and appropriate AP-level textbooks, equipment, and other AP-level resources. (essential, core schools, MIE initiates)
   4. MIE will provide participating schools the chance to be recognized.
      1. Provide schools the opportunity to be included in MIE’s annual Partner in Excellence (PIE) Award Celebration. (essential, all schools, MIE initiates)
      2. Present an award to an educational leader who has shown a deep investment in advancing AP, and another award to an outstanding supporter of the MIE program. (essential, all schools, MIE initiates)
   5. MIE will select schools for the program.
2. Teacher training and support activities
   1. MIE will increase the quality and effectiveness of AP STEM and English educators.
      1. Host a five-day AP summer institute training every summer and a two-day training session in the fall for AP teachers as professional development.
         1. At the summer institute, provide five days of comprehensive, content- focused professional development where teachers learn from AP instructors as well as their peers from other districts. (**essential**, all schools, MIE initiates)
            1. Offer trainings on AP courses, to help teachers develop instructional approaches that align with the goals of AP and to identify the tasks and materials for which students might need more preparation. Instructors share best practices and model lessons.
            2. Offer trainings on “Fundamentals in AP” courses, to increase rigor and strengthen content-specific pedagogy to better prepare more students for the rigor of AP coursework. (essential, all schools, MIE initiates) The Fundamentals in AP training focuses on instructional strategies and curriculum alignment to aid teachers in grades 7–12 (most are for grades 9 and 10) strengthen vertical alignment of instruction. During a school’s first year in AP STEM and English, it is offered five free seats in the “fundamentals” training, and if a school wishes to send more than five teachers, additional seats are offered at a discounted rate. The training focuses on training such as curriculum mapping and skill building. Teachers are taught to reintroduce the skills year after year so students are ready for AP. The training also helps schools/districts build a reserve of teachers ready to fill-in for AP if another teacher leaves.
         2. The two-day fall training is a concentrated and comprehensive professional development training for AP STEM and English teachers. Here, participants share best practices, engage in discussions, and learn focused and targeted strategies instrumental to successfully running their AP STEM and English courses. (essential, all schools, MIE initiates)
      2. Content directors:
         1. Provide ongoing instructional coaching (essential, core schools, MIE initiates, teachers optional), classroom support (essential, core schools, MIE initiates, teachers optional), observation and review of instructional

materials for AP STEM and English teachers (essential, all schools, MIE initiates).

* + - 1. Support AP STEM and English teachers’ course design (essential, core schools, MIE initiates, teachers optional), curriculum development (essential, core schools, MIE initiates, teachers optional), and pedagogy to strengthen teachers’ delivery of rigorous AP instruction (essential, all schools, MIE initiates).
      2. Share text resources and provide input on textbook and equipment choices identified by the College Board. (essential, all schools, MIE initiates)
      3. Offer sample unit exams and provide strategies for aligning course assessments to the AP exams to help students become familiar with the test format. (essential, all schools, MIE initiates, teachers optional)
      4. Teach AP STEM and English teachers how to read the Instructional Planning Report and coach them how to use it to strengthen their instruction. (essential, all schools, MIE initiates)
      5. At CORE high schools, content directors: (essential, all schools, MIE initiates)23
         1. Visit classrooms to observe and provide instructional feedback
         2. Co-teach lessons
         3. Model lessons in teachers’ AP STEM and English classes to demonstrate instructional strategies
         4. Assist with curriculum planning
         5. Provide instructional resources
         6. Funding for new equipment (core schools); occasional lending of science equipment resources for labs (core and sustaining schools)
         7. Build teachers’ content knowledge (essential)
         8. Review student work to identify exemplars according to the AP scoring rubric and helping teachers better understand how AP tests are assessed
      6. At sustaining schools, content directors offer similar mentoring and coaching supports, but focus this support on new AP STEM and English teachers and content areas where AP data reveals more needed support.
    1. Use the walkthrough observation tool to help define what to look for in a high- quality, rigorous AP class. (optional, core schools)

23 Unless otherwise noted, all supports listed under this heading are essential for all schools.

* + 1. Identify AP lead teachers to serve as resources, coordinators, and mentors within a cluster of participating schools. (essential, potentially both core and sustaining schools, since clusters are not exclusive to one type)
    2. Appoint a designated administrator in each of its school districts to consult with content directors and to help ensure curriculum alignment. (essential, core schools)
  1. In the Fundamentals in AP program, MIE will give teachers the skills to vertically articulate the curricula in math, science, English, and computer science.
     1. Provide vertical team teacher trainings and additional support to ensure alignment between the AP STEM and English courses and the existing district curriculum.
  2. MIE will hold AP STEM and English teachers’ accountable.
     1. Starting summer 2018, MIE will systematically share information with principals and AP STEM and English teachers about the teacher’s level of participation in support/training opportunities and the teacher’s student outcomes, given the different levels of AP STEM and English teacher involvement in the intervention.
     2. Mentor and monitor educator effectiveness and fidelity of implementation of AP STEM and English courses.

1. Student support activities
   1. MIE will work with all partner schools starting in SY17-18 to provide AP exam fee subsidies for all AP STEM and English students meeting DESE’s definition of economically disadvantaged to reduce the economic burden of taking AP STEM and English exams. (**essential**, all schools)
   2. MIE provides extracurricular study and exam preparation opportunities for AP STEM and English students. (essential, all schools)
      1. Offer 4-hour long regional student study sessions on Saturdays during the school year. 135 sessions will be offered throughout the school year. Nine Saturday sessions held throughout the year in each of the 15 regional clusters, for a total of 45 sessions for each science, math, and ELA.
      2. Provide mock exams (one each school year) to AP STEM and English students during the Saturday study sessions, to practice the AP test structure. MIE will grade these exams as an AP reader would and return exams to the AP STEM and English teachers.
   3. MIE works with sustaining schools to offer Saturday study sessions/additional time on tasks for teachers to assist students through one of the following:
      1. Provide funding to schools/districts to cover operational costs of study sessions.
      2. Provide funding to schools/districts to cover operational costs of mock exam sessions, with MIE and MIE Lead Teacher collaboration.
   4. MIE’s student partner program engages corporate and community partners to provide STEM awareness to MIE students. Companies partner with MIE to have employees participate in year-long engagement with AP STEM and English students in MIE schools,

### Outputs

consisting of students visiting the workplace and other engagements outside of the school to promote the value of STEM career pathways. (optional24)

* 1. MIE requests AP STEM and English teachers to continue providing outside-of-class tutoring to AP STEM and English students at or above the level indicated in the Initial Assessment Visit survey.
  2. MIE requires schools to provide transportation for AP STEM and English students to attend the Saturday study sessions. (essential, all schools)

Outputs: receipt of services/products of a program’s activities—usually measured in terms of the volume of work accomplished

*Note: in this section, information comes from the MIE COMMBUYS bid response unless otherwise specified*

1. School partner support outputs
   1. Startup
      1. Develop performance agreement, including goals and expectations of school culture moving forward toward AP participation (essential, core schools, 100%); core schools have letters of agreement and set formal goals to which the school will be held accountable (core schools); sustaining schools have letters of agreement with MIE that indicate the services that they choose to receive and/or participate in
      2. Initial assessment visits (what do these entail?) (essential, core schools, 100%)
   2. Support AP-kickoff events (events/fairs providing information about AP STEM and English courses; the kickoff is a key aspect of the program and designed to cultivate a college-going culture, motivate students and celebrate the effort of all students taking AP courses, and often supports the recruitment of students in subsequent years. (essential, core schools, 100%)
   3. Support for other recruitment-type events (e.g., parent nights, meetings with students, other community events) (essential, core schools, 100%)
   4. MIE provides/lends science equipment resources for labs—MIE covers the cost of math, science, English, and computer science equipment and supplies associated with implementing new courses and additional sections of AP math, science, English, and computer science courses to help incentivize and support AP expansion (**essential**, core schools, 100%)
      1. Equipment is only provided to “core” schools (starting with cohort 11) (**essential**, core schools, $5,000 year 1, $3,000 year 2, $2,000 year 3)

24 This item was described as optional by DESE in its review.

* + 1. $5,000/school for the first year, $3,000/$2,000 per school in 2nd/3rd years; schools encouraged but not required to match these amounts
    2. Examples: graphing calculators, document cameras, textbooks, StatCrunch software, access to online computer science texts, basic lab supplies (gloves, glasses, thermometers, etc.), classic novels
  1. Pathways/vertical alignment support: working with guidance counselors (others) (**essential**, core schools, 100%)
  2. Awards for administrators (MIE 2016 briefing) (optional, all schools, 1 award per year)

1. Teacher training outputs
   1. Professional development
      1. Summer Institute: 5-day program; offered to all AP teachers to attend twice during the program’s term of agreement (**essential**, core schools, 100%)
      2. 2-day workshop (October workshops): offered to all AP STEM and English teachers to attend each year during the program’s term of agreement (essential, core schools, 100%)
      3. Fundamentals in AP Training: Funding for up to five teachers (middle school or high school) to attend a Fundamentals in AP course at the MIE Summer Institute (five days) during the first/initial year of the Program’s Term of Agreement

(2018 letter of agreement sample) (essential, core schools, 100%)

* + 1. AP team meetings (essential, core schools, 2 times per year/school)
  1. Coaching and support by MIE content experts25; includes:
     1. Classroom visits to observe and provide instructional feedback (essential, core schools, 3 visits per discipline)
     2. Co-teaching lessons (essential, core schools, 3 visits per discipline)
     3. Modeling lessons in teacher’s AP STEM and English classes to demonstrate instructional strategies (optional, core schools, varies based on need)
     4. Assisting with curriculum planning (optional, core schools, varies based on need)
     5. Providing instructional resources (optional, varies based on need)
     6. Building teachers’ content knowledge (**optional**, core schools, varies based on need)
     7. Reviewing students’ work to identify exemplars according to the AP scoring rubric and heling teachers better understand how AP tests are assessed (core schools, varies based on need)
     8. Creation of teacher participation reports (**essential**, core schools, twice per year per school)
  2. Teacher stipends: up to $500 per AP STEM and English teacher (2018 sample LOA); additional stipend for MIE cluster lead teacher (essential, core schools, 100%)

25 While MIE considers coaching and support as essential, specific items may be considered optional based on the needs of individual schools.

* 1. Support for vertical alignment (primarily through the AP Summer Institute)(**essential**,

**core schools**, varies based on need)

* 1. Teacher awards—essentially recognition at the annual “Partners in Excellence” event (essential, all schools, $750/PIE award)

1. Student support outputs
   1. Regional study sessions: 6 per school per year (2 per content area) (**essential**, all schools, 60% of students attend session)
   2. School-led study sessions (**essential**, all schools, 60% of students attend session)
   3. Exam-fee subsidies: $300,000 on AP STEM and English examination fee subsidies for participating economically disadvantaged students in the 73 partner high schools. Assumes 5,524 AP STEM and English exams will be supported by the budgeted amount. The subsidy is meant to cover all but $5.00 of the remaining cost of the AP STEM and English exam fee for all economically disadvantaged students in participating schools. (**essential, all schools**, 100% of economically disadvantaged students) ($300,000 for economically disadvantaged students)
   4. Mock exams/mock exam grading: 3 per school per year (1 per content area); can occur on a Saturday or after school (schools, 60% of students take an exam)
2. Macro-level outputs26
   1. Number of AP STEM and English students from underrepresented populations supported—defined as the number of AP STEM and English students from underrepresented populations who take AP STEM and/or English exams (**essential**, core schools, TBD)
   2. Percent of AP STEM and English students from underrepresented populations taking an AP STEM and/or English exam (Performance Measures Renewal Form) (**essential**, core schools, TBD)
   3. Number of AP STEM and English teachers trained (number of newly participating AP STEM and English teachers)—it’s unclear what constitutes training (Performance Measures Renewal Form) (**essential**, core schools)

### Short-term Outcomes

Short-term Outcomes: benefits for participants

1. AP course-focused
   1. Course availability (number of courses/subjects); may be inferred in some sources with broader language such as to increase student *access* to AP STEM and English courses.

26 DESE has set performance measures for each of these items; see the Performance Measures Renewal Form for specific values (e.g., a specified percent increase for an item).

* 1. Course taking (% of students enrolled in STEM AP); similar to course availability, may be inferred in some sources with broader language such as to increase student *access* to AP STEM and English courses.

1. AP exam-focused
   1. Exam taking
   2. Exam scores of 3 or better
2. Others
   1. Teacher effectiveness (COMMBUYS bid response; other sources noted below); includes content knowledge and pedagogical skills
   2. Student interest in pursuing a STEM degree after high school)—could be an example of impact (2017 UMDI evaluation reports); *evaluation note—it was decided at the 12/3/18 meeting to keep this in the summary, but it will probably not be an element to be included in the evaluation’s fidelity study.*

### Impacts (Long-term Outcomes)

Impact: long-term or indirect effects of short-term outcomes

Summary of impacts (with sources)

1. Increase readiness for college-level study in science, mathematics, English, and computer science fields
2. Improve college attendance
3. (Improve) college attendance
4. (Increase) college persistence
5. (Improve) college completion
6. Increase student interest in pursuing a STEM degree or a STEM-related career after high school
7. Improvement in school culture surrounding AP course enrollment and AP exam taking. Context
   1. From DESE (the COMMBUYS bid says that these were developed by DESE )—the MIE COMMBUYS bid response lists a number of program “goals” (many of which get at outcomes), but also include two potential impacts:
      1. Increase readiness for college-level study in science, mathematics, English, and computer science fields (could also include reduction in the number of students who require remedial coursework in college, which is mentioned in the COMMBUYS bid response)
      2. Improve AP STEM and English teacher effectiveness, including content knowledge and pedagogical skills (this might better fit as an outcome)
   2. Also in the COMMBUYS bid response, three long-term outcomes are noted; these are also reflected in essentially the same form in a 2016 MIE report:
      1. College attendance
      2. College persistence (a MIE document briefing ESE lists “increased rates of first-second year persistence as a measure)
      3. College completion
   3. As noted in a 2013 MIE report, an increased share of MMSI students were graduating from high school; this could be a potential impact; the report lists a hypothesis that, “MMSI schools will experience slight increases in high school graduation due to improved instruction and a shift in expectations among teachers and students.”
   4. The UMDI evaluation reports references several additional “goals” that are likely are or at least could be interpreted as impacts:
      1. Improve science and mathematics teacher effectiveness, including content knowledge and pedagogical skills;
      2. Increase student interest in pursuing a STEM degree or a STEM-related career after high school.

# Appendix B

**Advanced Placement STEM and English Program Teacher Feedback Survey**

Thank you for participating in the Advanced Placement (AP) STEM and English Program online survey for teachers. You have been identified by the Massachusetts Department of Elementary and Secondary Education (DESE) and Mass Insight Education and Research (Mi) as a participant in the AP STEM and English Program at your school. The information you provide will be used to assess the ways in which the AP STEM and English Program is being implemented in participating schools. This survey focuses on the supports provided by Mi content directors.

This survey is voluntary and all feedback will be kept confidential. The survey should take approximately 20 minutes to complete.

Please note the following:

1. Several survey items use a multi-point scale. If you are taking the survey on your phone, you may have to scroll down to see the entire scale.
2. If you need to take a break and come back to the survey at a later time, please feel free to do so. This survey is programmed to automatically save your previous responses.
3. When finished, click the “Submit” button at the bottom of the final page to record your responses. You are free to leave the page, take breaks, or move throughout the survey and change responses until you click “Submit”.

Q1. Considering the following supports offered by Mass Insight’s content directors through the AP STEM and English Program, please identify any supports you have ever requested through the program, whether you have already received these supports, and whether you knew the support was available.

(Note: Please consider all supports received from content directors through visits to your school/classroom, phone, email, newsletters, etc. Supports received from content directors at the Summer Institute, two-day fall training, and Saturday study sessions *should not* be considered when responding to the items below.)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **Did you know this support was available?** | | **Did you request this support?** | | **Did you receive this support?** | |
| **Type of support** | **Yes** | **No** | **Yes** | **No** | **Yes** | **No** |
| Instructional coaching |  |  |  |  |  |  |
| Course design |  |  |  |  |  |  |
| Curriculum development |  |  |  |  |  |  |
| Curriculum planning |  |  |  |  |  |  |
| Knowledge of pedagogical  practices |  |  |  |  |  |  |
| Content knowledge |  |  |  |  |  |  |
| Equipment and supplies (i.e.,  textbooks, equipment, etc.) |  |  |  |  |  |  |
| Knowledge and guidance on textbook, equipment, and resource selections |  |  |  |  |  |  |
| Feedback on instructional materials |  |  |  |  |  |  |
| Sample unit exams |  |  |  |  |  |  |
| Strategies for aligning course  assessments to the AP exam |  |  |  |  |  |  |
| Assistance with utilizing the Instructional Planning Report |  |  |  |  |  |  |
| Classroom observation for instructional feedback |  |  |  |  |  |  |
| Co-teach AP class with content director |  |  |  |  |  |  |
| Content director modeled AP instruction |  |  |  |  |  |  |
| Assistance in learning how AP exams are assessed |  |  |  |  |  |  |
| Assistance in aligning school curriculum across grades 7– 12 |  |  |  |  |  |  |
| Assistance in aligning AP class curriculum to the College Board AP curriculum |  |  |  |  |  |  |

Q2a. Of the supports you received from Mass Insight’s content directors (via visits to your school/classroom, phone, email, newsletters, etc.), please select the approximate number of times you have ever received each type of support, and indicate the *total* amount of time you have ever spent with your content director receiving assistance for each support.

(Note: When responding to the item(s) below, please *do not* count interactions with content directors at the Summer Institute, two-day fall training, and Saturday study sessions.) *[Insert only the supports that were selected in Q1.]*

|  |  |  |
| --- | --- | --- |
| **Type of support** | **Number of times support received** | **Total time spent receiving support from Mass Insight content director** |
| Instructional coaching | 1, 2, 3, 4, 5+ times | Less than 15 minutes, 15–60  minutes, 1–2 hours, 2–3 hours, More than 3 hours |
| Course design | “ | “ |
| Curriculum development | “ | “ |
| Curriculum planning | “ | “ |
| Knowledge of pedagogical practices | “ | “ |
| Content knowledge | “ | “ |
| Feedback on instructional materials | “ | “ |
| Sample unit exams | “ | “ |
| Strategies for aligning course assessments to the AP exam | “ | “ |
| Assistance with utilizing the Instructional Planning Report | “ | “ |
| Classroom observation for instructional feedback | “ | “ |
| Co-teach AP class with content director | “ | “ |
| Content director modeled AP instruction | “ | “ |
| Assistance in learning how AP exams are assessed | “ | “ |
| Assistance in aligning school curriculum across grades 7–12 | “ | “ |
| Assistance in aligning AP class curriculum to the College Board AP curriculum | “ | “ |

Q2b. For the following support(s), please describe the equipment and supplies—and/or knowledge and guidance on equipment and supplies—you received from Mass Insight’s content directors. Be sure to describe how many, or how much of each support you have ever received. *[Insert only the supports that were selected in Q1.]*

|  |  |
| --- | --- |
|  | **Dosage** |
| Equipment and supplies (i.e., textbooks, equipment, etc.) | *Open-ended response.* |
| Knowledge and guidance on textbook, equipment, and resource selections | *Open-ended response.* |

Q3. For each of the following supports, please indicate whether the amount provided by Mass Insight’s content directors was sufficient for your needs. *[Insert only the supports that were selected in Q1.]*

|  |  |  |
| --- | --- | --- |
| **Type of support** | **Yes** | **No** |
| Instructional coaching |  |  |
| Course design |  |  |
| Curriculum development |  |  |
| Curriculum planning |  |  |
| Knowledge of pedagogical practices |  |  |
| Content knowledge |  |  |
| Equipment and supplies (i.e., textbooks, equipment, etc.) |  |  |
| Knowledge and guidance on textbook, equipment, and resource selections |  |  |
| Feedback on instructional materials |  |  |
| Sample unit exams |  |  |
| Strategies for aligning course assessments to the AP exam |  |  |
| Assistance with utilizing the Instructional Planning Report |  |  |
| Classroom observation for instructional feedback |  |  |
| Co-teach AP class with content director |  |  |
| Content director modeled AP instruction |  |  |
| Assistance in learning how AP exams are assessed |  |  |
| Assistance in aligning school curriculum across grades 7–12 |  |  |
| Assistance in aligning AP class curriculum to the College Board AP curriculum |  |  |

Q4. Please elaborate on why this support provided by the content directors was not sufficient for your needs: *[Insert only the supports that were a “no” response in Q3.]*

|  |  |
| --- | --- |
| **Type of support** | **If no…** |
| Instructional coaching | *Open-ended response.* |
| Course design | “ |
| Curriculum development | “ |
| Curriculum planning | “ |
| Knowledge of pedagogical practices | “ |
| Content knowledge | “ |
| Equipment and supplies (i.e., textbooks, equipment, etc.) | “ |
| Knowledge and guidance on textbook, equipment, and resource selections | “ |
| Feedback on instructional materials | “ |
| Sample unit exams | “ |
| Strategies for aligning course assessments to the AP exam | “ |
| Assistance with utilizing the Instructional Planning Report | “ |
| Classroom observation for instructional feedback | “ |
| Co-teach AP class with content director | “ |
| Content director modeled AP instruction | “ |
| Assistance in learning how AP exams are assessed | “ |
| Assistance in aligning school curriculum across grades 7–12 | “ |
| Assistance in aligning AP class curriculum to the College Board AP curriculum | “ |

Q5. Please indicate the extent to which each type of support provided by Mass Insight is essential for helping you as an AP teacher, with the ultimate aim of helping promote the AP STEM and English program’s goals. As a reference, the program goals include:

* Increase student participation and performance in AP STEM and English courses and exams, particularly among historically underserved populations.
* Increase equity and access to AP STEM and English courses and exams.
* Create a college-going culture among the entire school community in which all students believe that they can have a great future, characterized by students having an appreciation of academics, a desire to succeed, and a drive to attend college and become a lifelong learner.
* Increase the share of students who matriculate, persist, and graduate from college. To what extent is each support essential for helping you as an AP teacher?

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **To a great extent** | **To a moderate extent** | **To a small extent** | **Not at all** |
| Instructional coaching |  |  |  |  |
| Course design |  |  |  |  |
| Curriculum development |  |  |  |  |
| Curriculum planning |  |  |  |  |
| Knowledge of pedagogical practices |  |  |  |  |
| Content knowledge |  |  |  |  |
| Equipment and supplies (i.e., textbooks, equipment, etc.) |  |  |  |  |
| Knowledge and guidance on textbook, equipment, and resource selections |  |  |  |  |
| Feedback on instructional materials |  |  |  |  |
| Sample unit exams |  |  |  |  |
| Strategies for aligning course assessments to the AP exam |  |  |  |  |
| Assistance with utilizing the Instructional Planning Report |  |  |  |  |
| Classroom observation for instructional feedback |  |  |  |  |
| Co-teach AP class with content director |  |  |  |  |
| Content director modeled AP instruction |  |  |  |  |
| Assistance in learning how AP exams are assessed |  |  |  |  |
| Assistance in aligning school curriculum across grades 7–12 |  |  |  |  |
| Assistance in aligning AP class curriculum to the College Board AP curriculum |  |  |  |  |

Q6. Reflecting upon your classroom practices and students’ needs, please indicate the extent to which you need support in the listed areas.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **High need** | **Moderate need** | **Low need** | **No need** |
| Instructional coaching |  |  |  |  |
| Course design |  |  |  |  |
| Curriculum development |  |  |  |  |
| Curriculum planning |  |  |  |  |
| Knowledge of pedagogical practices |  |  |  |  |
| Content knowledge |  |  |  |  |
| Equipment and supplies (i.e., textbooks, equipment, etc.) |  |  |  |  |
| Knowledge and guidance on textbook, equipment, and resource selections |  |  |  |  |
| Feedback on instructional materials |  |  |  |  |
| Sample unit exams |  |  |  |  |
| Strategies for aligning course assessments to the AP exam |  |  |  |  |
| Assistance with utilizing the Instructional Planning Report |  |  |  |  |
| Classroom observation for instructional feedback |  |  |  |  |
| Co-teach AP class with content director |  |  |  |  |
| Content director modeled AP instruction |  |  |  |  |
| Assistance in learning how AP exams are assessed |  |  |  |  |
| Assistance in aligning school curriculum across grades 7–12 |  |  |  |  |
| Assistance in aligning AP class curriculum to the College Board AP curriculum |  |  |  |  |

Q7. What is the name of your school?

*[Insert drop-down of all high schools surveyed.]*

Q8. How many years have you been a teacher?

* This is my first year
* 2—3 years
* 3—6 years
* 7—10 years
* More than 10 years

Q9. How many years have you been teaching Advanced Placement (AP) classes?

* This is my first year
* 2—3 years
* 3—6 years
* 7—10 years
* More than 10 years

Q10. In what year did you first participate in Mass Insight’s AP STEM and English training?

*[Insert drop-down menu starting with 2005-06 forward]*

Q11. In which content area(s) do you teach AP classes? Please select all that apply.

* English
* Math (includes computer science)
* Science
* Other (please specify)

*[Note: This question is a multi-response selection.]*

Q12. Who is your content director from Mass Insight?

* Sally Guadagno (Managing Director of AP STEM and English)
* Mimi Letourneau (AP Stats)
* Carla Comeau (AP Computer Science)
* Leslie Prudhomme (AP Sciences)
* Patti Azzara (AP ELA)
* Myra Morgan (AP Environmental Science)
* Sue Biggs (AP Chemistry)
* John Pinizotto (AP Physics)
* Other (please specify)

*[Note: This questions is a multi-response selection.]*

Q13. How often does a Mass Insight content director typically communicate (via email, phone, etc.) with you? Please consider all support activities and other check-in type communication.

* Daily
* Weekly o Biweekly o Monthly
* Less frequently than monthly
* I do not communicate with Mass Insight content directors

Q14. Through which means do you typically communicate with your content director? Please select all that apply.

* In-person visits to your school/classroom (excludes interactions at the Summer Institute, two- day fall training, and Saturday study sessions)
* Email
* Newsletter
* Phone
* Other (please specify)

Q15a. Do you regularly communicate with anyone else from Mass Insight?

* Yes
* No

Q15b. Please list the other Mass Insight staff members you regularly communicate with.

*[Open-ended question.]*

# Appendix C

###### Percentage of teachers that requested and received each support

|  |  |  |
| --- | --- | --- |
| **Number of supports** | **Percent of teachers that requested each support X times** | **Percent of teachers that received each support X times** |
| 0 supports | 29% | 18% |
| 1 support | 6% | 6% |
| 2 supports | 9% | 7% |
| 3 supports | 6% | 8% |
| 4 supports | 5% | 5% |
| 5 supports | 9% | 10% |
| 6 supports | 7% | 5% |
| 7 supports | 5% | 8% |
| 8 supports | 4% | 4% |
| 9 supports | 3% | 5% |
| 10 supports | 2% | 2% |
| 11 supports | 4% | 5% |
| 12 supports | 2% | 5% |
| 13 supports | 2% | 2% |
| 14 supports | 1% | 1% |
| 15 supports | 2% | 2% |
| 16 supports | 2% | 3% |
| 17 supports | 0% | 1% |
| 18 supports | 2% | 3% |

# Appendix D

###### Responses to Q2b

**Equipment and supplies**

*1 classroom set of the PTC lab - Leslie Prudhomme ran the lab with my students over the span of a week, and the students still reference what they learned today*

*8 APES textbooks (Friedland)*

*A couple sample textbooks, materials from professional development days All of the above*

*Anchor texts*

*Ap Chemistry textbooks*

*Ap Materials for Great Expectations Bpa test lab equipment*

*Choice in selecting textbook and getting access to content information boards etc Class activities and assessments were provided through weekly emails*

*Classroom set of text Everything's an Argument. Director suggested 3 books and gave me copies. I made the final decision. Classroom set Keypoint audience reply remotes. I wanted them for immediate response on Multiple Choice questions. Our school had a budget. I got them. 3 document readers.*

*Copies of On the Road Digital Textbook Document Camera*

*Document camera (1), access to Albert.io online learning site*

*Equipment: g-ball lab; Textbooks: Free copies of physics sample textbooks; 1 set of 24 of Etkina (College Physics) Feedback on materials I created*

*Flash cards, textbooks, Summer courses etc.*

*Gel Electrophoresis DNA lab, content director spent the day with me and my AP class instructing and coordinating the lab, as well as integrating information into curriculum.*

*Have received materials like textbooks, review books, access to borrowing multiple kinds of equipment (PCR, CO2 probes, associated materials). Equipment also came with in-room support the first times being used and lots of contact to make sure things were working as planned.*

*I have had Leslie come into my class over the year, she has also let me borrow equipment I knew this existed, but I haven't used it, just discussed at the 2 day in October*

*I know that the contact person at my school with MIE asked for textbook requests in the past. I also remember I may not receive some of my requests so I kept them simple. I did receive what I ordered.*

*I received many textbooks, Barron Cards, Barron Practice Book, as well as software. I received some textbook samples and reviewed them with content director.*

*I received text books through the grant*

*I was told that I could borrow equipment if needed, but I have not done so yet Kindles from MIE funds for AP CSP course*

*Lab materials*

*Laboratory Equipment & Supplies*

*Leslie from Mass insight has helped me with probeware and share engaging activities. Lessons from TeachArgument.com*

*MiniPCR equipment (3 years), PTC lab materials, sample lap report templates Mock exams, sample test, sample books*

*Money for textbooks when we started the program. Not sure how much. Multiple textbooks*

*Multiple textbooks, including the Anchor text*

*New TI-84 graphing calculators (30), New Textbooks with amazing ebook access & resources (40) - The Practice of Statistics 6ed*

*PCR Machines, computers, gel electrophoresis*

*Received equipment and support with use of equipment once a year for the last 3 years. We received materials/equipment for 2 labs (cellular respiration and photosynthesis). During the first and second year the content director was involved in the teaching of those labs as well.*

*Received sentence style books, supplies such as sticky notes, markers, large poster size sticky paper Recommendations were received concerning appropriate LabQuest modules and sensors*

*Teacher tablet for AP CSP, Test/Practice Test packets from Institute/Seminar Text books for language and lit courses*

*Text books, contacts who helped get calculators, resources for review and online engagement*

*Textbook samples from 2 day workshop Textbook, flashcards*

*Textbooks Textbooks*

*Textbooks (~60 student editions, 3 teacher editions)*

*Textbooks that are not used or provided by Boston Public School, coordination and alignment with College Board content*

*Textbooks, at least 20 Textbooks, resource selections*

*Use of biotech equipment (annually for 3 years), cockroach colony for respiration studies (1 time, 20 minutes), Numerous conversations about what to buy for equipment and from whom.*

*Various texts for class Vernier Probeware*

*We get newsletters regularly that contain resources, materials, suggestions, etc*

*We have received funding for equipment (first year of grant--smartboard/document reader). Books multiple times... class sets.*

*We received AP Statistics textbooks in our first year of teaching the course.*

*We received guidance from the content directors we have had in English on the best textbooks to choose for our new Language class and our Literature class which was in need of new texts at the time. They also guided us in obtaining electronic devices such as the Elmo for use in the classroom for projection and annotation purposes.*

*Worksheet on different type of AP topics*

###### Guidance and knowledge

*2 Different Programming Textbooks, 42 in total.*

*2 x 2 whiteboards for my class, Use of projectile launchers (6)*

*A supplemental workbook was recommended for my AP Calculus course, and it is excellent.*

*All equipment came well-supported with suggested materials, activities, and troubleshooting. The first time miniPCR materials were used, the content director came to lead the class activity with me for the whole week.*

*Both Mimi and Sharon Hessney provided me with guidance on resources available and provided me with resources/lessons/activities.*

*Class activities and assessments were provided through weekly emails Director taught a topic using the worksheet*

*Examples of easy to do labs using easy to obtain equipment through the MIE 2-day in October. These are too numerous to detail here.*

*Given in newsletters*

*Guides for targeting students*

*Help choosing textbook for initial course offering Help selecting course textbooks*

*I chose the course text book on my own when we first ran the course. Several years later, I was able to choose a new text. I discussed suggestions on how to go about comparing books. This was done during the 2-day event.*

*I did not receive guidance on equipment or supplies.*

*I met with my content rep to help plan and use resources two times so far.*

*I never asked for or requested guidance and/or knowledge on any of the textbooks or resources.*

*I received suggestions on what to include as well as model vocational school syllabi to help me plan my course*

*Instruction using TI 84, math apps, stats crunch*

*Leslie came and showed me how to use Vernier probes for numerous labs. She was incredibly helpful. Many hours of assistance through trainings and workshops attended*

*MIE guided me through selecting a textbook to choose*

*Networking with teachers in other school districts and the sharing of best practices. Over three years*

*PPT's and supplemental material*

*Received feedback on new textbook we decided to order.*

*Representatives explained the advantages of these new texts and how they align to our learning goals Resources emailed to me*

*Sample problems were highlighted and other key features of the textbook and how to use it in the classroom*

*Text books*

*The Practice of Statistics, StatsMedic, Stats for Stem, NYTs What's Going on in this Graph? and countless supplemental resources through weekly newsletter and emails.*

*They also send materials for pacing, teaching and implementation but I do not know how many. Tons of support*

# Appendix E

###### Extent to which each support was considered essential by support type (aggregated for both teachers who requested and did not request each support)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Extent to which support was considered essential | | | | |
| Support | To a great extent | To a moderate extent | To a small extent | Not at all |
| Course design | 31% | 31% | 23% | 16% |
| Curriculum planning | 30% | 35% | 20% | 15% |
| Curriculum development | 30% | 31% | 23% | 16% |
| Content knowledge | 36% | 30% | 20% | 14% |
| Equipment and supplies (i.e., textbooks, equipment, etc.) | 37% | 30% | 19% | 14% |
| Knowledge and guidance on textbook, equipment, and resource selections | 23% | 29% | 30% | 18% |
| Instructional coaching | 27% | 29% | 26% | 18% |
| Knowledge of pedagogical practices | 24% | 35% | 28% | 13% |
| Strategies for aligning course assessments to the AP exam | 30% | 35% | 19% | 16% |
| Assistance with utilizing the Instructional Planning Report | 21% | 28% | 26% | 25% |
| Co-teach AP class with content director | 16% | 18% | 27% | 39% |
| Assistance in aligning AP class curriculum to the College Board AP curriculum | 22% | 31% | 22% | 24% |
| Feedback on instructional materials | 19% | 35% | 26% | 20% |
| Assistance in learning how AP exams are assessed | 30% | 33% | 19% | 18% |
| Assistance in aligning school curriculum across grades 7–12 | 18% | 24% | 18% | 40% |
| Sample unit exams | 42% | 23% | 19% | 17% |
| Classroom observation for instructional feedback | 15% | 20% | 32% | 32% |
| Content director modeled AP instruction | 22% | 24% | 26% | 29% |

# Appendix F

## Comparison of level of engagement

After identifying the universe of schools used for this comparison, the evaluation team developed an analysis plan for comparing the two data sources, the survey data and the Mi data, as each included different elements related to level of teacher engagement by Mi content directors:

* The Mi-provided data covered an approximate total number of interactions between content directors and participating core schools for the 2017–18 school year. The template developed by UMDI included a breakdown of contacts made in-person by Mi content directors versus approximate other contacts (e.g., by phone or email) by school; it also contained the AP subject areas in which the school participated in the program. Mi also indicated the total number of participating teachers at each core school.
* The teacher feedback survey included a question on support frequency, in terms of the number of times each respondent had ever received each of 16 support types within the broad teacher support category. 27 This question asked participants to respond on a five-point scale: 1 = *1 time*, 2 = *2 times*, 3 = *3 times*, 4 = *4 times*, and 5 = *5+ times*.

Both of these methods for assessing level of engagement were limited, most notably because of their differences in 1) the timeframe considered, and 2) number and type of supports referenced. The timeframe for the data provided by Mi bound to the 2017–18 school year, while survey respondents reported the number of times they had ever received a support. Further, the Mi data was a *total* of *all supports* received by the *entire school*; the survey data was limited as far as the number of times *each teacher* received *each individual support*, up to the *5+ times* option.

As a basis of comparison, the study team calculated an average for each data source to control for the different time periods for the data (i.e. 2017–18 vs. 2018–19 school years) and nuances in how the supports were alternately worded and described. For the Mi data, this meant calculating an average number of interactions per teacher per school for each of the nine schools. The approximate number of interactions provided by Mi served as the number of interactions. To average the data collected from the survey, we calculated the average level of engagement (based on interactions) per teacher for each school. The survey question on support frequency was recoded to gage level of engagement, so that *1 time* = 1, *2 times* = 2, *3 times* = 3, *4 times* = 4, and *5+ times* = 5, where 1 = lower levels of engagement and 5 = higher levels of engagement. This recoded level of engagement was calculated for each support,

27 Two support types, “equipment and supplies” and “knowledge and guidance on textbook, equipment, and resource selections,” provided for open-ended responses on the frequency of receipt because of differences in the type and method of assistance and are not included in these frequencies.

and the final average was calculated across all supports. The number of teachers for both data sources was provided by Mi. Because we calculated different measures of content director engagement with teachers for each data source, the average level of engagement calculated from each of the data sources were not directly comparable.

After the averages were calculated, frequency distributions were utilized to define high or low levels of engagement for each school, for each data source. Figure 14 below illustrates the frequency distribution for the average number of interactions per teacher per school for the Mi data. As illustrated, eight of the nine schools averaged 4–7 interactions with Mi. Given this distribution, six interactions was set as the lower bound for high-engaging schools (schools averaging six and higher interactions were defined as high engaging, and schools with five or less interactions categorized as low engaging).

###### Figure 14: Distribution of average number of contacts per teacher per school *for Mi data*

3

2

**Number of schools**

1

0

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28

**Average number of interactions per teacher per school**

Given this distribution, five schools from the Mi data were classified as high engaging (Ayer Shirley Regional High School, Diman Regional Vocational Technical High School, Grafton High School, Haverhill High School, and Pathfinder Regional Vocational Technical High School) and four schools as were classified as low engaging (Doherty Memorial High School, Joseph P. Keefe Regional Technical School, Lowell High School, and Tri-County Regional Vocational Technical High School).

Using a similar process for the survey data, the frequency distribution for the survey question on level of engagement per teacher per school suggested that a value of six would serve as an ideal lower bound for high-engaging schools. Figure 15 on the following page illustrates the frequency distribution for the average level of engagement per teacher per school for the survey data.

###### Figure 15: Distribution of average level of engagement per teacher per school *for survey data*

3

**Number of schools**

2

1

0

1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39 41 43 45 47

**Average level of engagement per teacher per school**

The frequency distribution for the survey data suggested that four schools classify as high engaging (Diman Regional Vocational Technical High School, Grafton High School, Haverhill High School, and Joseph P. Keefe Regional Technical School) and five schools classify as low engaging schools (Ayer Shirley Regional High School, Doherty Memorial High School, Lowell High School, Pathfinder Regional Vocational Technical High School, and Tri-County Regional Vocational Technical High School).

## Trends identified during the data analysis

To identify trends in the comparison of the level of engagement data, high- and low-engaging schools as defined from the Mi data were compared to high- and low-engaging schools from the teacher feedback survey data. Table 5 on the following page contrasts these two data sources by level of engagement.

Schools highlighted in gray were labeled with the same level of engagement across data collection methods.

###### Table 5: Comparison of high and low engagement schools for Mi data and survey data

|  |  |  |  |
| --- | --- | --- | --- |
| **Data Collection Method** | | | |
| **Level of Engagement** | **High Engaging Schools** | **Mi Data**   * Ayer Shirley Regional High School * Diman Regional Vocational Technical High School * Grafton High School * Haverhill High School * Pathfinder Regional Vocational Technical High School | **Teacher Feedback Survey Data**   * Diman Regional Vocational Technical High School * Grafton High School * Haverhill High School * Joseph P. Keefe Regional Technical School |
| **Low Engaging Schools** | * Doherty Memorial High School * Joseph P. Keefe Regional Technical School * Lowell High School * Tri-County Regional Vocational Technical High School | * Ayer Shirley Regional High School * Doherty Memorial High School * Lowell High School * Pathfinder Regional Vocational Technical High School * Tri-County Regional Vocational Technical High School |

Levels of engagement were generally similar between the two data sources. As highlighted, six of the schools were categorized with the same level of engagement across both data sources. Three schools were consistently labeled as high engaging: Diman Regional Vocational Technical High School, Grafton High School, and Haverhill High School; and three schools were consistently labeled as low engaging: Doherty Memorial High School, Lowell High School, and Tri-County Regional Vocational Technical High School.

The three schools that did not match across data sources (Ayer Shirley Regional High School, Joseph P. Keefe Regional Technical School, and Pathfinder Regional Vocational Technical High School) all joined during the 2016–17 school year, as highlighted in Table 6 on the following page. This table also illustrates that the four schools that joined during the 2017–18 school year were all consistently categorized as high- or low-engaging schools.

###### Table 6: Year each school joined the AP STEM and English program

|  |  |
| --- | --- |
| **School** | **Year School Joined** |
| Ayer Shirley Regional High School | 2016–17 |
| Diman Regional Vocational Technical High School | 2017–18 |
| Doherty Memorial High School | 2017–18 |
| Grafton High School | 2016–17 |
| Haverhill High School | 2017–18 |
| Joseph P. Keefe Regional Technical School | 2016–17 |
| Lowell High School | 2017–18 |
| Pathfinder Regional Vocational Technical High School | 2016–17 |
| Tri-County Regional Vocational Technical High School | 2016–17 |

No obvious trends were found in either data source between standard high schools and vocational technical high schools.