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**Mandating Change:
Assessing the Implementation
of the Michigan Merit Curriculum**

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Mandating Change:

Assessing the Implementation of the Michigan Merit Curriculum

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Table of Contents

Introduction.....	3
Background.....	4
The Michigan Merit Curriculum	4
National Graduation Requirements	6
Academic Course-Taking in Michigan.....	8
Math Requirements at Post-Secondary Level.....	10
Literature Review	11
Impact of Raising Mid-Level Requirements: A High School Transcript Study	11
High Stakes Graduation Requirements: Effects of Accountability Standards.....	12
Impact of Increased Course-Taking: Student Achievement Effects	13
Benefits of a Constrained Curriculum: NAEP and the 1990 High School Transcript Study	14
Long-Term Benefits of Additional Coursework: Labor Market Effects.....	15
Potential Lack of Implementation at the School Level.....	16
Methods	16
In-Person Interviews.....	17
Online Survey Instrument.....	17
Findings.....	19
Effects of Implementation	20
Changes in Course-Taking Patterns.....	20
Failure Rates	21
Challenges to Implementation	22
Meeting State Standards	22
Changes in Staffing	25
Student Preparation	26
School Resources.....	27
Local Policy Concerns	28
Responses to MMC Pressures	30
Scheduling Changes.....	30
New and Modified Courses	31
Online Learning	32
Additional Support for At-Risk Students	32

Student and Parent Outreach	33
Teacher Support and Changes in Teaching Methods.....	33
Preemptive Application of Standards.....	34
New Textbooks	34
Administrator Attitudes Toward the Michigan Merit Curriculum.....	34
Conclusion	35
Works Cited	37
Appendix A. In-Person Interview Questionnaire.....	39
Appendix B. Online Survey Questionnaire	40

Introduction

On April 20, 2006, Michigan governor Jennifer Granholm signed into law the Michigan Merit Curriculum – a set of core graduation requirements that are among the highest in the nation. The Michigan Merit Curriculum (MMC) requires all students in the graduating class of 2011 and beyond to obtain four credits in English, four credits in math (including Algebra I, Algebra II, and geometry), three credits in science, three credits in social studies, and one credit each in physical education, visual or performing arts, and an online learning experience (See Table 1). The MMC was initially touted as a way to ensure that every student graduating from a Michigan high school would be ready for a college level curriculum. Proponents of the measure also argued that the new MMC requirements would prepare students for the workforce, helping the state’s transformation into a 21st century economy (Michigan Department of Education, 2006b).

However, as opposed to the state-level reforms in the mid-1980s across the country which seemed to follow pre-existing local trends (Clune & White, 1992), this transition actually made many substantive changes to local requirements. It has mandated a dramatic change in course taking by students across the state, not only requiring students to take more challenging courses, but also to take more of them in order to graduate. As a result, schools must offer more classes in all core subject areas and ensure that students pass even the most rigorous courses in order to obtain a high school diploma. Therefore, tensions arise about hiring enough teachers to staff these new courses and providing enough resources to help students pass them. Normally, this would theoretically necessitate an increase in financial resources for schools. However, with the state’s recent budget crises, school funding levels have either remained stagnant or decreased, placing even greater pressure on schools and districts to meet the demands of the Michigan Merit Curriculum.

In addition to these *prima facie* challenges to implementation (staffing and resources), there are also multiple policy challenges presented at the local level including, but not limited to, student attendance requirements, length of the school year, student discipline, and the calculation of student GPA. While these policies are typically under local control, the Michigan Merit Curriculum is placing pressure on local officials to re-examine many of these long-standing decisions.

Finally, the graduating class of 2011 will be the first group of Michigan students subject to the new requirements, and as such, the state does not have data about the impacts of the MMC on test results or graduation rates – the class of 2011 will not take the Michigan Merit Examination until the spring of 2010. Perhaps more disconcerting is the fact that without the possibility of earning Michigan Promise Scholarships for taking the exam, there will be little incentive for students to complete the test, causing a potential bias in any data that is collected from the spring 2010 administration.

This report seeks to identify and quantify some of the challenges faced by districts as they push their students to higher academic levels in a time of fiscal hardship. We have conducted surveys and interviews of school and district level personnel from across the state to determine the major roadblocks to fully implementing the MMC as well as strategies that have been successful so that they may be replicated on a large scale.

In the pages that follow, we will first provide background information on national graduation requirements, course-taking patterns of students not subject to the MMC, and studies conducted over the past twenty-five years which attempt to draw connections between graduation requirements, academic course-taking, high

school graduation, student achievement, and future earnings. We will then discuss the methods of the study, including in-depth interviews with key informants at the district and intermediate school district level and an online survey instrument distributed to high school principals across the state. We will also discuss the sampling methods and response rates, including any possible biases in the responses. We will then turn to a discussion of the results of our surveys, with a prioritized list of challenges faced by school leaders as they try to meet the requirements of the MMC. Finally, we will discuss both the largest challenges and successes across the state from a policy perspective – analyzing possible solutions and supports from the state level.

Table 1. MMC Graduation Requirements

Michigan Merit Curriculum High School Graduation Requirements	
Mathematics – 4 credits	
Algebra I	Geometry
Algebra II	One math course in final year of HS
English Language Arts – 4 credits	
English Language Arts 9	English Language Arts 11
English Language Arts 10	English Language Arts 12
Science – 3 credits	
Biology	One additional science credit
Chemistry or Physics	
Social Studies – 3 credits	
½ credit in Civics	½ credit in Economics
U.S. History and Geography	World History and Geography
Physical Education & Health – 1 credit	
Visual, Performing and Applied Arts – 1 credit	
Online Learning Experience	
World Language – 2 credits (Class of 2016)	

Background

Before determining whether or not the implementation of the Michigan Merit Curriculum has been a success, it is important to ground our understanding of the requirements in both a national and state-specific context. Herein, we divide state-level graduation requirements into three distinct categories – low-level, mid-level, and high-level – based on the level of state mandates placed on the conferral of a degree. We then analyze results from the ACT for the class of 2009 to provide some baseline data on course-taking patterns among Michigan students and begin to estimate the effects of mandating certain course patterns for all students. Finally, we review a significant body of academic research on the topic of graduation requirements to provide a context for the prior impacts of increasing requirements elsewhere.

The Michigan Merit Curriculum

The Michigan Merit Curriculum was signed into law on April 20, 2006 and enacted some of the highest graduation requirements in the nation (Education Commission of the States, 2007). These new requirements required students to take four English Language Arts (ELA) courses, four math courses, three science courses, three social studies courses, one visual/performing art, one physical education course, and complete an “online learning experience.” The curriculum, in this form, was approved by the legislature. When the MMC was initially

presented to the State Board of Education, a world languages requirement was added, effective with the class of 2016. In all, the MMC will eventually require all students obtaining a high school diploma from the state of Michigan to complete no less than eighteen courses.

This curriculum was devised by a panel of state and local education officials, college deans, and representatives from industry, who analyzed scholarly research on curriculum reform and studied reforms in Singapore, Indiana, Oregon, and Arkansas (Steptoe, 2006). Two of the main goals of this curriculum was to double the college graduation rate in the state of Michigan and, in so doing, expedite the state's transition to a "21st century economy" (Michigan Department of Education, 2006b; Michigan Department of Education, 2006c).

All of these courses are required to be aligned to the Michigan High School Content Expectations (HSCEs), which were developed concurrently with this curriculum. The HSCEs cover all core courses at the high school level and were enacted to provide some measure of uniformity in courses across the state (Michigan Department of Education, 2006a). All districts and schools are also required to base a student's grade in a course on assessments of content material. However, how much these assessments count, what content they cover, and when they are given are all left to local control.

While graduation requirements had largely been determined locally until the passage of the MMC,¹ the new curriculum is notable for the sheer number of required courses relative to prior state mandate. The additional courses can put a strain on what electives (non-required classes) students can feasibly take during their high school career. School schedules are determined locally and can range from six courses per day for an entire year to four courses per day for one semester, followed by four different courses for the next semester, resulting in a typical range of six to eight courses (Carnegie units) per year per student. With this range, the MMC dictates between fifty-five and seventy-five percent of the courses students take during their high school careers, leaving room for one to three electives per year. Here, "electives" refers to any course not specifically outlined in the MMC, including, but not limited to, additional visual arts courses, band, orchestra, choir, debate, theater, psychology, sociology, creative writing courses, trigonometry, calculus, statistics, earth science, marine biology, oceanography, and any AP courses.

Due, in part, to the specificity and rigor of the courses required, the legislation allowed for the creation of a "personal curriculum" (PC) for students who may have trouble completing the requirements of the curriculum. A PC can be created by a parent in conjunction with a teacher and principal to meet the needs of individual students, but only beginning in their junior year. Until that time, all students are required to persist in the core courses. However, to avoid students using the PC as a way to not pass basic courses, the legislature was very specific in regards to which courses can be waived and how (See Table 2).

The ELA, science, world language, and online learning experience requirements cannot be amended unless the student has an Individualized Education Program (IEP) under the Individuals with Disabilities Education Act, or the student has transferred from another state and has already completed two years of high school. For the math requirements, all students must complete Algebra I and geometry, and can lower their Algebra II requirement to only ½ credit. All students still must complete a "math-related" course in their senior year. In social studies, all students must complete Civics and at least 2 social studies credits prior to modification. They

¹ The only state requirement for graduation prior to the Class of 2011 was a state government/civics credit.

may then substitute the final social studies requirement for another ELA, science, math, or world languages credit. Students may also substitute their physical education and visual/performing arts credits for an ELA, science, math, or world languages credit.

Additionally, students who can demonstrate knowledge of a particular subject area must have the opportunity to do so for course credit. That is, students have the option of taking a test, determined by the district/school, to demonstrate that they understand the content of a course. If the student passes the exam, she may receive the credit without taking the course.

Finally, schools can teach integrated curricula, particularly in math, that give students credit for obtaining the knowledge and skills in another setting, such as a Career/Technical Education course. If a student takes a shop class in which they cover the content of geometry in an applied manner, they can receive credit for geometry under the MMC. What particular courses qualify for this exemption is at the discretion of the local school district.

Table 2. Personal Curriculum Modifications

Subject Area Requirements	Personal Curriculum Modifications
4 English Language Arts (ELA) Credits	No Modification
4 Mathematics Credits	Minimum of 2 credits prior to any modification 1 credit of Algebra II may be modified to ½ credit
3 Science Credits	No modification
3 Social Studies Credits	No modification of Civics Minimum of 2 credits prior to any modification 1 credit may be exchanged for additional ELA/math/science/world language
1 Physical Education and Health Credit	Credit can be exchanged for an additional ELA/math/science/world languages credit
1 Visual, Performing, and Applied Arts Credit	Credit can be exchanged for an additional ELA/math/science/world languages credit
2 World Languages Credits	No Modification
Online Learning Experience	No Modification

National Graduation Requirements

Nationally, forty-two states currently have requirements for graduation, with twenty-five offering a “college preparatory” diploma (Education Commission of the States, 2007). However, requirements from state to state can vary widely, with some states (such as North Dakota) requiring students to only complete a certain number of Carnegie units, some (such as Missouri) requiring a certain number of units in each core content area, and others (such as Texas) requiring students to complete a large number of specific courses (See Table 3).

Given the variety of graduation requirements across the nation, it may be helpful to think of state level requirements in terms of three “levels” of mandate. States with “low level” graduation requirements set no specific state-level course mandates. Instead, the states may set a base number of credit hours that students must meet in order to graduate. Other decisions, such as which courses students must take and how credits are determined for those courses, are left up to the local educational agencies (LEAs) within the state. This broad

latitude can generate a myriad of different graduation requirements that not only may differ from other states, but between districts and possibly between schools. However, it also maintains a great deal of local autonomy in the school system.

States with “mid-level” graduation requirements take a more proactive role in defining the basic standard for graduation. Rather than simply providing schools with a total number of credits, these states provide a breakdown of how those credits should be allocated. For instance, students in Alaska must take four years of English, two of math, two of science, and three of social studies. However, which specific math courses students take is not mandated by the state. Students who take Algebra I and geometry would be eligible for a diploma just as a student who took pre-Algebra and Tech Math. In this model of state mandates, local control over the curriculum is limited to the specific courses students are required to take, if those courses are specified at all at the local level. One potential benefit of this design is that low-achieving students are not mandated to take higher level coursework, freeing those courses up for higher-achieving students, and making it easier for the lower-level students to obtain a high school diploma. However, this also means that students within schools who graduate with the same diploma may have drastically different competencies, and there is no basic level of knowledge that can be assumed.

“High-level” states not only mandate the number of courses in each subject area that students must take, but also the specific courses within that series. In this model, LEAs are left with very little discretion about which courses to offer. As a result, high school diplomas from across the state have essentially identical value, with the same coursework needed to obtain each one. The potential drawback to this method of setting requirements is that schools with historically low-performing students or with drastic teacher shortages may have trouble staffing certain courses, especially in math and science. While this method removes a large degree of local autonomy, it has been a popular reform in recent years, with eight states other than Michigan adopting rigorous “high level” standards.

It is also important to note that there is another type of state control over graduation standards that has not been discussed herein – requirements based on end-of-course (EOC) tests. Several states, including North Carolina and New York, use EOC tests to determine whether or not students have met certain basic standards. These EOCs are based on state-level content standards and are typically norm-referenced, like many other state-wide assessments. They are structured similarly to final exams, and are often given at the very end, or near the end, of a given course. In some instances, credit for a given course is contingent upon whether or not a student can pass the EOC. In other instances, a large percentage of the student’s final grade is based on this performance. We do not place this as a fourth and highest level of enforcement because it is used in both mid-level and high-level states. For example, in North Carolina, students have three diploma tracks (college prep, college technical prep, career prep), each of which has mid-level requirements.² However, to obtain credit in specific courses (e.g. biology, chemistry, Algebra I, geometry, English 9, U.S. History, Civics), students have to take, and often pass, EOC exams. Additionally, many states have enacted high stakes graduation exams. These exams, rather than covering content from any one particular course, cover a wide array of topics and are essentially minimum competency exams.

² The requirements for the college preparatory diploma has high-level requirements in math and social studies. Other subject areas and diploma tracks typically mandate only a number of credits to obtain in that subject area.

Table 3. Example Graduation Requirements

Subject Area	Low-Level	Mid-Level	High-Level
English	--	4	ELA 9, ELA 10, ELA 11, ELA 12
Math	--	2	Alg. I & II, Geom., one other
Science	--	2	Biology, Chem., one other
Social Studies	--	3	US Hist, Civ. & Econ., World Hist
Physical Education	--	1	1
Arts	--	0	1
Foreign Language	--	0	2
EXAMPLE STATE	Nebraska	Alaska	Michigan

Academic Course-Taking in Michigan

Even though the state of Michigan does not maintain public records at a state level about which courses students are enrolling in and how many complete each course series, this information can be obtained using data released from the ACT. Since 2007, every eleventh-grader in the state of Michigan has been required to take the ACT as part of the Michigan Merit Examination. While completing the ACT, students fill out an informational section about which classes they have taken and expect to complete by the time they graduate. By examining the results for the graduating class of 2009, we can begin to develop a baseline understanding of how many students in the state of Michigan are already meeting the requirements of the Michigan Merit Curriculum. It is important to note, however, that many of these results come from 11th grade students in the spring, and ask about what courses they expect to complete by the time they graduate. As a result, some students may have expected to take particular course sequences that they did not complete, and other students may have completed course sequences that they did not intend to take. We should therefore take these results as a preliminary and cursory view of academic course-taking, rather than an exact measure which would require detailed transcript studies.

The ACT defines a “core” level of coursework as four years of English, three years of math, three years of science, and three years of social studies by the end of a student’s high school career. Among the graduating class of 2009, only 54% of Michigan students had completed a 4-3-3-3 curriculum (ACT, 2009). However, a larger percentage of students had completed the core level of coursework in each subject area (81% English, 79% math, 84% social studies, 72% science). Although a large majority of students had taken the core level in each subject area, there were fewer students who met the core requirements in all four subject areas. However, Michigan’s new graduation requirements are “high level,” and as such, we should look to specific courses rather than the total number of courses taken.

Among the class of 2009, 56% of students had taken the minimum of four years of English as mandated under the MMC with another 25% taking more than the new requirements – 81% of total students meeting the requirements (See Table 4). Under the new requirements, 100% of students will be required to take these courses, amounting to a 23 percentage point increase over current levels in the number of students completing four English courses. However, given that one quarter of students had taken more than the minimum number of English credits, it appears as though staffing may not be a major concern in this field.

Table 4. Student Self-Reported Course Paths, Class of 2009

Math	
Total Met Michigan Merit Curriculum Requirements	31%
Algebra I, Algebra II, Geometry, 1 Other	10%
Algebra I, Algebra II, Geometry, Trigonometry	8%
Algebra I, Algebra II, Geometry, Trigonometry, 1 Other	8%
Algebra I, Algebra II, Geometry, Trigonometry, Calculus	5%
Total Did Not Meet Michigan Merit Curriculum Requirements	66%
Algebra I, Algebra II, Geometry	19%
4 years Math (Other)	24%
3 years Math (Other)	5%
<3 years Math (Other)	18%
Total Reporting	94%
Science	
Total Met Michigan Merit Curriculum Requirements	68%
Biology, Chemistry, 1 Other	29%
Biology, Chemistry, Physics	7%
Biology, Chemistry, Physics, 1 Other	32%
Total Did Not Meet Michigan Merit Curriculum Requirements	29%
3 years Science (Other)	4%
<3 years Science (Other)	25%
Total Reporting	97%
Social Studies	
Total Met Michigan Merit Curriculum Requirements	6%
U.S. History, World History, Government	4%
U.S. History, World History, Government, 1 Other	2%
Total Did Not Meet Michigan Merit Curriculum Requirements	91%
4 years Social Studies (Other)	44%
3 years Social Studies (Other)	34%
<3 years Social Studies (Other)	13%
Total Reporting	97%

In math, only 55% of students in the class of 2009 took four or more years of courses. Perhaps even more worrisome, almost half of those students (24% of the total) took a math series that did not include Algebra I, II, and geometry. Out of the total graduating class of 2009, only 31% of students expected to have met the requirements of the MMC by the time they graduated. Perhaps more promising is that 19% of the total students took only Algebra I, II, and geometry, requiring only one additional math or “math-related” course. Nonetheless, Michigan schools will have to more than triple the number of students taking Algebra I, II, geometry, and another math in order to meet the requirements of the MMC. With a quarter of the total class of 2009 taking a 4-year math series that did not fulfill the MMC requirements, there will potentially need to be a redistribution of faculty into the mandated courses, while hiring of new teachers in these subject areas.

In science, 72% of students took three years worth of courses. 36% of students took biology, chemistry, and one other science, with an additional 32% taking biology, chemistry, physics, and another science. Overall, of the graduating class of 2009, 68% would have met the Michigan Merit Curriculum requirements for science, requiring schools to increase student enrollment in these course sequences by a third.

In social studies, 84% of students took three years or more of content matter. 46% of the class took four years of social studies, with 38% taking three years of coursework. However, out of the graduating class of 2009, only 6% would have met the MMC requirements. This would require schools to increase the number of students taking the MMC core by a factor of 16 over its current levels. Perhaps more comforting than in other subject areas, there are a large number of students in the state of Michigan taking more courses than required, so staffing may not be as much of a concern as it is with other subject areas. Rather, schools will need to redistribute social studies teachers into the MMC core courses.

Math Requirements at Post-Secondary Level

As noted above, one of the major impetuses for the passage of the Michigan Merit Curriculum was a desire to increase the preparation of high school graduates for a college-level curriculum. To that end, we were interested in determining to what degree the Michigan Merit Curriculum requirements align with expectations in state colleges and universities. To simplify this process, we examined only math requirements as content covered in English, social studies, or the sciences is highly variable and has a less defined progression of content. Additionally, we examined the requirements at a handful of community colleges. This decision was made because the expectations of prior content knowledge are typically lower at local community colleges than at large research universities. Additionally, many students use community colleges as a cheaper avenue for earning credits before eventually attending larger, four-year colleges.

Upon examining the course sequences outlined in math programs at several community colleges (as an example, see Figure 1), we found that the math requirements of the Michigan Merit Curriculum strongly aligned with, and even overlapped, the courses at the beginning of the math sequence. At both Washtenaw Community College and Henry Ford Community College, successful completion of Algebra II in high school has the potential to allow students to bypass two “remedial” math courses and one 100-level course, moving directly into college algebra or a similar course. Depending on the content covered in the high school course, the student may also be prepared to bypass their college algebra class as well, depending on the results of their math placement exams.

While placing out of multiple math classes can dramatically increase the likelihood that a student will be successful in the college environment, it also reduces the financial burden on a student. Bypassing three courses at Washtenaw Community College (Foundations of Mathematics, Foundations of Algebra, and Intermediate Algebra), will save an in-state student between \$960 and \$1,572, depending on the location of their home. If a student also bypasses College Algebra, the potential savings increases to between \$1,280 and \$2,096. For low-income students, these savings are significant and could potentially make the difference between a decision to attend post-secondary school or not.



Figure 1. Math Course Sequence at Washtenaw Community College (** Content covered by Michigan Merit Curriculum Requirements)

Literature Review

For more than two decades, researchers have been examining the impact of higher standards on student achievement. On average, much of this research indicates that students on the margins may benefit the most from higher requirements (Chaney, Burgdorf, & Atash, 1997). These students typically take more courses than they did before (Clune & White, 1992; Teitelbaum, 2003), and this additional coursework has the potential to increase their achievement in a given subject area (Jones, Davenport, Bryson, Bekhuis, & Zwick, 1986; Sebring, 1987).

Impact of Raising Mid-Level Requirements: A High School Transcript Study

Until recently, very few states had ever enacted high-level graduation requirements. In the mid-1980s and early 1990s, many of the changes in state-level requirements involved either enacting mid-level requirements or increasing the number of courses required under such requirements. As a result, academic course-taking was not greatly impacted at the upper levels (Clune & White, 1992).

Clune and White conducted a transcript study in four states (California, Missouri, Pennsylvania, and Florida) to determine the impact of increased graduation requirements on student course-taking. The reforms they were examining focused heavily on increasing the number of required courses in each subject area. Among these four states, the authors admit that only Florida could be viewed as a “high-change” state, thereby limiting the study’s application to analyzing large state-level changes. Within these states, the authors purposively selected four

schools located in two to three districts. At least one of the schools in each state was an urban high school, and one other was rural. All schools had to be four year high schools in the lowest quartile of district achievement which did not undergo any major changes between 1980 and 1989. Within these high schools, the authors selected twenty-five transcripts at each of three time periods for analysis.

Clune and White found that the greatest effects were on low-achieving students who tended to take more courses than they did before. However, the courses that they took were largely at the beginning of course sequences rather than at the end (more students taking pre-Algebra rather than trigonometry). However, the authors themselves indicated that the sampling was non-random and non-representative of schools as a whole. In conjunction with the small sample sizes at each time period and the unique policy questions they were analyzing, the external validity of this research is small, particularly as it applies to the MMC. More than anything else, this study should serve as an indicator of possible effects of only modestly increasing graduation requirements – they influence students who are not yet meeting minimum requirements to obtain the basic standard, but rarely incite higher-level course-taking. Other studies have also shown that even though more students take more courses in mathematics and science with more stringent graduation requirements, not all students take advanced courses (Teitelbaum, 2003).

High Stakes Graduation Requirements: Effects of Accountability Standards

As school systems adopt greater accountability standards, it is important to understand the differential effects of varying requirements. A study by Schiller and Muller (2003) attempted to answer this very question. Using data from the National Education Longitudinal Survey of 1998-1992 and data collected from the National Cooperative Education Statistics System, the authors compared student course-taking with various levels of state requirements, including raising the number of courses required for graduation, instituting a more extensive testing system, and creating consequences for schools and/or students. Using a sample of over 10,000 students across all fifty states and the District of Columbia, Schiller and Muller analyzed how these requirements affected the freshman mathematics course taken by students and the number of advanced courses they took during their high school career (defined as geometry and above). Even after controlling for socioeconomic status, they found that increased graduation requirements did increase the average level of course taken in the freshman year, with an effect size similar to all family indicators. Increased graduation requirements also decreased the impact of racial/ethnic background on student course-taking. In contrast, the extensiveness of testing reduced the average level of course taken in the freshman year and increased the effect of socioeconomic status, indicating that states with high levels of testing also tended to have larger gaps between high- and low-SES students.

Schiller and Muller also investigated the impact of changing requirements on the number of advanced courses taken in high school. They found that when a state increased the number of courses required to graduate, students actually took fewer advanced courses in high school, potentially because they were also taking more advanced courses in ninth grade. That is, even though students started high school at a higher level of coursework (e.g. completing Geometry in ninth grade instead of Algebra I), they did not complete more courses overall, generally ending the course sequence where they would have in the absence of the intervention (e.g. trigonometry as a final course in both instances, despite additional time to complete other courses). In contrast, school-level consequences had a positive effect on the number of advanced courses taken by students. In short, adopting certain policies can and does have an impact at the student level on course-taking. Students who must

complete more credits to graduate tend to start high school at a higher level of mathematics, but also tend to take fewer advanced courses during their high school career. Students subject to extensive testing tend to start high school at a lower level, but take approximately the same number of advanced courses in high school. States with higher consequences for schools also tend to have students taking more advanced courses. Finally, most graduation policies (except for extensive testing) tend to mitigate the impact of racial/ethnic background of a student, a finding that has been discovered elsewhere as well (Schiller & Muller, 2000).

Impact of Increased Course-Taking: Student Achievement Effects

With that being said, research has also indicated that increasing the number of courses that students take, especially in math above the Algebra I level, has an impact on student achievement in that subject area (Jones, Davenport, Bryson, Bekhuis, & Zwick, 1986). Such links were also found in science courses, but the relationship was weaker. Jones, et al. used data from the 1980 High School and Beyond study that examined the math, science, and verbal aptitudes of almost 10,000 high school students who were sophomores in 1980. Many of these students were then retested in 1982. The authors analyzed the relationship between the number of advanced math and science courses students took (both self-reported and on their transcripts) and correlated it with their achievement on the 1982 series of tests. Advanced math courses were defined as those at the Algebra I level and above, with a low of zero and a top-code value of five. Before conducting their analysis, the authors also saw fit to control for home environment (including factors of socioeconomic status), achievement on the 1980 series of tests (to parse out any effects from middle school or earlier), and achievement on the verbal section of tests (to separate out any effects that may arise from “more intelligent” students taking more courses). These controls take into account all student achievement measures available and many factors of socioeconomic status. If any improvements were to be made, we may have liked to include some measure of school fixed effects, understanding that the quality of a school is likely associated with both the number of advanced courses students take and their achievement, and not all of these factors may be included in a measure of home environment. Leaving out this variable may create a positive bias in the results, providing too strong of an effect of additional coursework on achievement tests.

After controlling for these factors, the authors found that an increased number of courses at the Algebra I level or above had a strong and statistically significant impact on student achievement. The correlation between these coefficients increased as the number of advanced courses increased, dropping off slightly at $M=5$ due to ceiling effects. In this study, the difference between students who had completed no advanced math courses and those who were top-coded was more than two standard deviations in test score, indicating an extremely large impact of additional math courses on student achievement. In science, increased course-taking was associated with increased achievement, but when Jones, et al. controlled for achievement on the 1980 test, less than 2% of the total variance was explained by additional coursework. The authors attribute this difference to the shorter science test and the variation in content covered by “biology,” “chemistry,” or “physics” in classrooms across the nation (especially when compared to the much smaller variation in “Algebra I”). If we take into account the potential omitted variable bias introduced by excluding school level fixed effects, science effects may completely disappear.

The only analytical concern of this study beyond the omitted variable bias (OVB) is a disconnect between the self-reported course-taking of students and the transcript records. In fact, using students’ transcripts rather than self-reports results in a decrease in the predictive ability of the model. The authors attribute this

disconnect to errors in transcript coding or students' reporting course content (e.g. Calculus) that was taught in other courses (e.g. Algebra II). Nonetheless, the predictive model is strong in math, indicating that more math coursework increases student achievement in the subject, even after controlling for home environment, prior achievement, and student intellectual capability.

However, the relationships between course-taking and student achievement are not limited only to math and science (given that the OVB does not mitigate any science effects). Using information from the High School and Beyond survey and the College Entrance Examination Board, Sebring (1987) studied course-taking patterns and achievement in additional subjects among 1980 high school seniors in New York, Pennsylvania, Ohio, Illinois, Washington and California and 1982 high school seniors in New York and California. She found that after controlling for verbal and mathematics aptitude, performance on achievement tests in American History, French, Math 2, and Chemistry was positively associated with students having taken more coursework in social studies, language, mathematics, and physical science, respectively. However, these findings must be taken with an important caveat—students taking the SAT were self-selecting. Nevertheless, because she found that the relationship between course-taking and achievement held across most aptitude levels, she argues that it is possible to extrapolate these findings to non-college bound students.

Despite these promising findings, other research has shown little or no change in student test scores related to higher graduation requirements directly (Teitelbaum, 2003). In 2003, Teitelbaum conducted a study using information from 5,586 public high school graduates with transcript and test score information from 732 schools which was gathered as part of the National Educational Longitudinal Study. The purpose of his study was to examine the effects of more stringent graduation requirements. He found that after controlling for race, sex, socioeconomic status (at the school and individual student levels), eighth grade test scores, and vocational or general path, stricter standards did not have a statistically significant effect on student test scores. His findings did not indicate that this was because of the dilution of curricula. A hypothesis that higher graduation requirements leads to higher student test scores requires an intermediate process, namely that those higher requirements lead students to take more classes. The ultimate explanation advanced by Teitelbaum and other studies (Clune & White, 1992) is that increased requirements did not directly influence students to take more advanced coursework, which minimized any potential effects of graduation requirements on test scores.

Benefits of a Constrained Curriculum: NAEP and the 1990 High School Transcript Study

A constrained curriculum is one which offers fewer choices to students in the courses that they take and increases the number of academic courses in which they enroll. Using data available from the 1990 High School Transcript Study and the National Assessment of Educational Progress (NAEP), Lee, Croninger, and Smith (1997) examined the impact of a constrained mathematics curriculum on the math performance of students. Drawing a sample of over 3,000 students from 123 schools, the authors used hierarchical linear modeling to determine the impact of a constrained curriculum on student test scores. In their analysis, the authors controlled for student, school, and community characteristics, including, but not limited to, demographics, socioeconomic status, variability in graduation rate, ninth grade GPA, and parents' educational status. Lee, et al. found that schools whose math curriculum is more than 75% academic courses had the highest average proficiency on the 12th grade NAEP. Those whose math curriculum was less than 50% academic courses had the lowest average proficiency. Both results were significantly different ($p=.001$), from schools with 50-75% academic courses.

Even more interestingly, the authors also found that schools with lower levels of academic courses also tended to have lower socioeconomic status³, more minority students, more female students, and a lower 9th grade GPA² than other schools. Since higher socioeconomic status is negatively associated with minority status and positively associated with prior achievement, we cannot necessarily disentangle these effects from one another, i.e. develop a causal relationship, from this analysis. However, using HLM, the authors did find that, at the student level, social class and ninth grade GPA are positively correlated with 12th grade achievement and gender (female) and minority status are negatively correlated with 12th grade achievement. At the school level, every indicator of a constrained curriculum was positively associated⁴ with average achievement, controlling for other factors. In short, Lee, et al. found that a more constrained, more academic curriculum was positively associated with overall achievement holding constant factors such as socioeconomic status, demographics, and entering achievement levels.

Long-Term Benefits of Additional Coursework: Labor Market Effects

Higher curriculum standards are rarely end goals in and of themselves; such policies are often intended to have long term consequences. Goodman found that there are fairly significant labor market effects associated with increased math coursework (Goodman, 2009). For his study, he compiled a nationally representative time series of high school transcripts that contained detailed information about completed coursework. This information came from two data sources: Census data and high school transcripts collected by the National Center for Education Statistics in 1982, 1987, 1990, and 1994. In an effort to mitigate selection bias, he also used an instrumental variable: differentially timed state-level reforms of high school graduation requirements.

Using two-sample instrumental variable estimates, Goodman found that reforms had a particularly strong impact on the course-taking and earnings of black males. After reforms, black males completed .40 more math courses (roughly evenly split between basic and advanced), and black females completed .28 more math courses (mainly more advanced coursework). Among whites, reforms were associated with a .19 course increase among males and a statistically insignificant increase of .10 among females. Furthermore, he found that each additional year of math raised blacks' earnings by 5-9%, which is a large part of the value of a year of schooling. Much of this effect came from blacks who attended schools that were less than 80% white and who will not attend college. Thus, the reforms close one fifth of the earnings gap between black and white males. While there also appeared to be an effect on whites, this effect was less clear and was somewhat masked by the smaller impact of reforms on white students' coursework. He summarizes his findings by concluding that math coursework is important for earnings, less rigorous requirements benefit lower-achieving students, and more rigorous requirements may be necessary to improve the earning outcomes of higher-achieving students.

However, there are some important caveats to this study. Because only information about graduates was available for the 1990 and 1994 waves of transcript collection, Goodman excluded information about dropouts from the 1982 and 1987 studies. Thus, he cannot comment on the effects of higher requirements on high school completion. In addition, because Goodman used state of birth as a proxy for state of high school completion in the Census data, he also excluded Hispanics from the study since many were born outside of the United States. Therefore, an important demographic is thus not present in this study. Furthermore, he

³ Significant at the p=.05 level

⁴ Significant at the p=.001 level

identifies variation in the study by comparing observations from states that had stricter reforms in 1987 and earlier to those who enacted reforms in 1988 or later. However, states that enact reforms earlier may be different than those that passed reforms later. Even though Goodman found no statistically significant difference in initial course-taking between states that reformed earlier, later, or not at all and does control for state fixed effects, there are other observable and unobservable characteristics that can vary between states over time.

Despite some limitations, this study does demonstrate the important long term benefits of increased graduation requirements. In addition to substantially affecting course-taking among black males especially, taking more math courses was associated with higher earnings after graduation. Thus, increasing graduation standards can also have important impacts on states' economies.

Potential Lack of Implementation at the School Level

Despite research indicating the positive effects of higher graduation requirements, there are other less promising findings about the extent to which these standards have been implemented. In Teitelbaum's 2003 study (see above), he found that about 15% of the surveyed students that were technically required to complete three credits in mathematics failed to do so, and about 20% failed to take three credits in science (Teitelbaum, 2003). It is important to note that more students in schools with requirements took more credits in these subjects (about 30% of students in schools without such requirements took less than three credits in mathematics and 42% took less than three credits in science). However, it is troubling that schools with more rigorous requirements allowed so many students to graduate without completing three credits in these subjects.

Another study that examines the implementation of graduation requirements was conducted by Sipple, Killeen, and Monk (2004). Most of their data came from interviews and document analysis from five New York State school districts collected in the 2000/2001 school year, which was supplemented by a descriptive trend analysis of school districts between the 1991/1992 and 1999/2000 school years (Sipple, Killeen, & Monk, 2004). Their research, which focused on the early years of implementation of more rigorous standards in New York State, indicated that initial school district compliance with higher graduation requirements may be somewhat superficial, with strong rhetoric promoting the standards from the superintendent but limited change among teachers. The study also highlighted the importance of local environment and context in the way that standards were implemented. Clearly, while there is some research demonstrating the positive benefits of higher graduation standards, the effect of such requirements greatly depends on how they are implemented in practice.

Methods

To determine the level of implementation of the Michigan Merit Curriculum and any substantial challenges posed by the new state mandate, we conducted an online survey of high school principals across the state and in-depth personal interviews with thirteen school officials at the building, district, and intermediate school district level.

In-Person Interviews

In order to assess the level of implementation of the Michigan Merit Curriculum, we surveyed school officials at the school, district, and intermediate school district (ISD) level. These stakeholders included principals, district curriculum coordinators, and superintendents. One-on-one interviews were conducted with both current and former school officials either in their offices or via video conference. All interviews were conducted in October and November of 2009 and covered many of the same questions as the survey instrument while allowing a more in-depth conversation about the issues surrounding implementation. Interviews ranged in length from 25 to 75 minutes and provided interview subjects the ability to comment on both their personal successes and challenges, and responses from the larger online survey instrument. No interview subjects also completed the online survey instrument.

Subjects for in-person interviews were identified both through convenience and snowball sampling. That is, initial contacts were made with school leaders who were either close in proximity to the University of Michigan or who had personal connections with UM faculty or staff (convenience sampling). These initial contacts then provided us with links to other stakeholders who potentially would provide additional pertinent information for our study (snowball). Subjects included ISD superintendents and curriculum coordinators, district superintendents and staff, and school level principals and teachers. For privacy concerns, their names and specific positions are withheld.

All of the interviews included basic questions regarding school or district level response to the MMC (see Appendix A), but allowed the official substantial leeway in guiding the conversation to particular issues they felt needed to be addressed with the plan. Specific issues that arose in these discussions are outlined in the “Findings” section below.

Online Survey Instrument

We also surveyed high school principals in Michigan using the online survey software Qualtrics. In order to maximize the number of responses, the survey was distributed to all 604 principals for whom we had accurate contact information rather than using a random sampling method. According to Keesler et al., there are a total of 892 public high school principals in Michigan (Keesler, Wyse, Jones, & Schneider, 2008, p. 2). Principals were given fourteen days to respond to the survey before it was closed. In total, we received 238 responses to the instrument – a response rate of 39.4%. This response rate is high for email-based surveys (Sheehan, 2001), likely because of the salience of the issue and the number of follow-up communications sent to non-respondents.

However, by providing the survey instrument to all available administrators and allowing them to decide whether or not to participate, we potentially introduced bias into any results as principals who have particularly strong emotions about the MMC may self-select into taking the survey. In short, these principals may be in some way substantively different than the general population of principals. Principals who are more apathetic or who have done less to implement the new standards may be among those that did not respond. Additionally, those who have particularly struggled with the new standards or are more opposed to the standards may be more likely to respond. To determine whether respondents and non-respondents differed substantively, we solicited school identifiers from each survey respondent and compared the school characteristics of respondents against the characteristics of the entire population of Michigan high schools, specifically focusing on such factors

as percent of the population qualifying for free or reduced price lunch, size of the school, racial/ethnic composition, and prior test results.

We found that respondents were markedly different from non-respondents (Table 5).⁵ Respondents were principals from schools which tended to have fewer students living in poverty, fewer minority students, more students graduating on time, a lower student to computer ratio, higher test scores, and were more likely to make adequate yearly progress as defined by the No Child Left Behind Act of 2001. This indicates that our respondents were from more privileged schools that, theoretically, may have less challenges in meeting the requirements of the Michigan Merit Curriculum. These principals may have been more likely to respond for several reasons. These particular types of schools may have been more satisfied with the prior status quo, and changes in graduation requirements may have seemed like more of an intrusion than it did with lower performing schools which have been subject to more state intervention in the last decade. Additionally, principals from less advantaged schools may have been less likely to respond because of challenges at the school site that made it more difficult for them to find time to complete the survey.

Table 5. Descriptive Statistics of Respondents and Non-Respondents*

Parameter	Population (n=604)	Respondents (n=238)	Non-Respondents (n=366)	Statistically Significant?
% Qualifying for Free/Red. Price Lunch	37.4	34.4 (1.13)	39.4 (1.07)	Yes (p=.0019)
% White	79.9	84.8 (1.26)	76.8 (1.55)	Yes (p=.0002)
% Made AYP	72.3	76.9 (2.74)	69.4 (2.41)	Yes (p=.0443)
Graduation Rate	86.7	88.5 (0.83)	85.4 (0.79)	Yes (p=.0075)
MME Math Scale Score	1093	1096 (0.70)	1090 (0.87)	Yes (p=.0000)
Students Per Computer	10.6	3.3 (0.08)	15.4 (4.95)	Yes (p=.0495)

*p-values are obtained from a two-tailed t-test of difference in means; Standard errors are shown in parentheses

However, with these caveats in mind, even though the differences between the groups are statistically significant in every category, this does not inherently bias all of our results. On the contrary, it implies that all of our results should be viewed in the context of the group that provided them – somewhat more affluent schools

⁵ A linear probability model assessing the relationship between all of the variables listed in Table 5 and the likelihood of response provided an F-statistic of 14.74 with p=0.0000.

with fewer minority students, higher graduation rates, and higher test scores. For this group, we may have a large measure of external validity. Whether these results can effectively be extrapolated to all principals is a more complex issue and one that could be resolved at a later date.

Findings

We found that the majority of schools added new courses to their curriculum in response to the MMC and almost 40% of schools had to add additional sections of existing courses to meet the new requirements (See Table 6). More than a third of principals reported that significantly more students were taking more challenging courses in response to the new curriculum. The majority of teachers have not had difficulty aligning their courses to state standards. More than any other challenge, 55% of schools indicated that poor student preparation was a major challenge to full implementation of the curriculum.

Table 6. Raw Percentages from Survey Instrument

Location of School	
Urban	8.8
Suburban	31.5
Rural	55.5
New Classes Offered?*	
No	21.4
New Classes	55.0
New Sections, Existing Classes	39.1
Course-Taking Effects	
Significantly more students taking more challenging courses	37.4
Some more students taking more challenging courses	45.0
No change	14.3
Have teachers had difficulty aligning their courses?	
No	52.1
Somewhat	37.0
Yes	6.7
What implementation challenges have you faced?*	
Not enough qualified teachers	15.1
Poorly prepared students	55.0
Classroom Space	14.3
Online Learning Experience	6.3
Other	29.4

*Totals do not sum to 100% as respondents could select more than one response

Effects of Implementation

Changes in Course-Taking Patterns

Course-taking patterns also changed among students as a result of the Michigan Merit Curriculum. Of the 235 high school principals that responded, 37% stated that significantly more students were taking more challenging classes, 45% stated that some students were taking more challenging classes, and 14% stated that students had already been taking classes now required by the Michigan Merit Curriculum (Figure 2). None of the respondents indicated that there was no change in course-taking patterns due to insufficient classes being offered for students to fulfill the Michigan Merit Curriculum requirements. These results demonstrate that the new Michigan Merit Curriculum did have a substantial effect on student course enrollment.

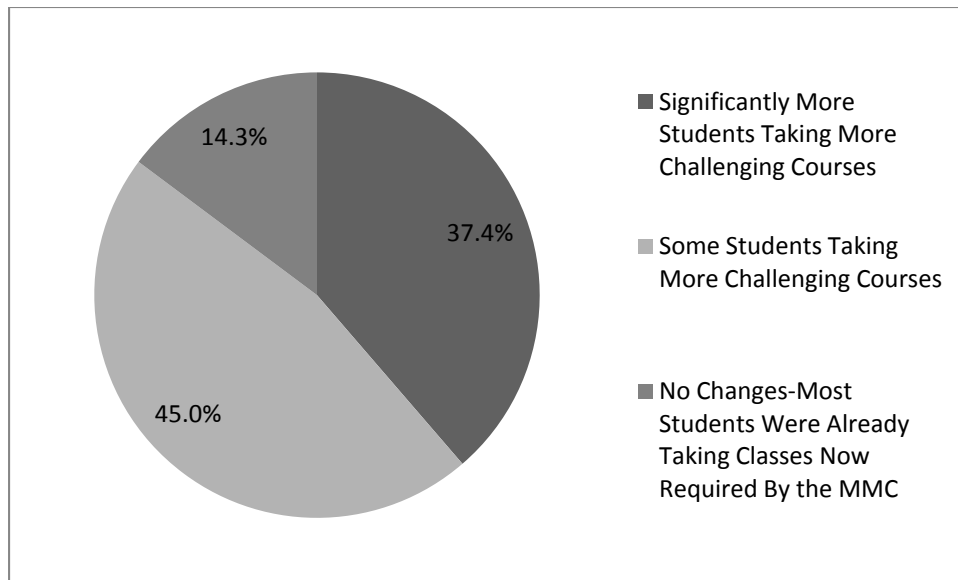


Figure 2. Have course-taking patterns changed as a result of the Michigan Merit Curriculum?

Changes in course-taking patterns do not seem to be strongly related to school poverty levels. In our initial analysis, we found that schools in which significantly more students were taking more challenging courses had slightly more students living in poverty than other schools, and those schools that indicated no change in student course-taking patterns tended to have fewer students living in poverty.⁶ To further examine the relationship between poverty and survey results, we divided schools into four quartiles based on the proportion of students qualifying for free or reduced price lunch in the last year. Schools in the 1st quartile thereby had the smallest proportion of students living in poverty and those in the 4th had the most. We received a higher response rate from principals whose schools are in the first and second quartile, and had a lower response rate from principals whose schools are in the third and fourth quartile.

In this analysis (presented in Table 7), we noted that schools in the 1st quartile were less likely to indicate that students were taking significantly more courses and more likely to indicate that students were taking some more challenging courses or have no change. Schools in the fourth quartile were the least likely to indicate no

⁶ Differences were not statistically significant at the 5% level ($p=.0795$ and $p=.0681$, respectively)

change in course-taking behavior, and more likely to indicate either some more or significantly more challenging courses. Schools in the second and third quartiles were more likely to indicate that some more or significantly more students were taking more challenging courses. However, overall the relationship between school-wide poverty level and the change in course-taking patterns was weak and not statistically-significant.

Table 7. Course-Taking Changes by Poverty Level of School*

Impact on Student Course-taking	Quartiles of Proportion Qualifying for Free/Reduced Price Lunch				All
	1 st (Fewest)	2 nd	3 rd	4 th (Greatest)	
Significantly more students taking more challenging courses	19 26.03%	34 46.58%	27 44.26%	9 40.91%	89 38.86%
Some more students taking more challenging courses	40 54.79%	30 41.10%	26 42.62%	11 50.00%	107 46.72%
No Change	14 19.18%	9 12.33%	8 13.11%	2 9.09%	33 14.41%
Total	73 100.0%	73 100.0%	61 100.0%	22 100.0%	229 100.0%

*Whole numbers represent numbers of respondents. Percentages are column percentages. Differences are not statistically significant (p=0.214)

Failure Rates

Unfortunately, most counties in Michigan do not compile information about course failure rates. Thus, our discussion is limited to examining changes in course-taking and failure rates in Macomb County between the 2005-2006 and 2008-2009 academic years.⁷ As seen in Table 8 below, failure rates have not increased as dramatically as was feared because more students would be taking more challenging classes. The percentage of ninth graders that failed at least one class remained steady at 34%. Enrollment in Algebra I increased by 1735 students, or 22.8%, but the failure rate only increased by 4 percentage points. In Geometry, enrollment increased by 21.3% and the failure rate increased by 6 percentage points. Even though enrollment in Algebra II increased by 29.4%, the failure rate only increased by 1 percentage point. Thus, while failure rates are increasing in classes that are now becoming mandatory, the increase in failure rates is much lower than the increase in enrollment rates. These results are encouraging and suggest that many students that are now required to take more challenging courses are capable of succeeding.

⁷ Data was provided by Dr. Gayle Green, Chief Academic Officer/Assistant Superintendant of Instruction for the Macomb Intermediate School District.

Table 8. Macomb County Course-Taking and Failure Rates

Course	2008-2009 Academic Year		2005-2006 Academic Year	
	N	Failure Rate	N	Failure Rate
Algebra I	9,348	27%	7,613	23%
Geometry	10,359	19%	8,539	13%
Algebra II	7,602	13%	5,873	12%
Biology	13,048	15%	10,584	13%
Chemistry	8,183	13%	6,055	7%
Physics	3,659	7%	2,886	3%
All Ninth Graders	8,443	34%	8,239	34%

Challenges to Implementation

Meeting State Standards

Determining how much school course offerings had to change in response to the Michigan Merit Curriculum must be assessed at two different levels. First, we must see if sufficient courses and classes are being offered for students to complete the Michigan Merit Curriculum (i.e. if there are enough math courses and sections so that students can complete four years of math). Second, we should examine how well each course meets requirements (i.e. if Algebra I contains all of the skills required by state standards). While assessing how much schools needed to change their course offerings, we will also discuss other factors that could have made meeting the Michigan Merit Curriculum more challenging.

Changes in Course Offerings

One of the questions in the online survey asked whether the school had added more classes in order to fulfill Michigan Merit Curriculum requirements. There were 231 responses, and out of those that answered the question, 22% stated that enough classes had been offered already, 41% stated that new courses (i.e. Algebra II) were offered, and 57% stated that new sections of existing classes were offered (respondents were allowed to select more than one answer). Thus, most schools added more courses and/or course sections in order to meet the requirements of the Michigan Merit Curriculum, as seen in Figure 3.

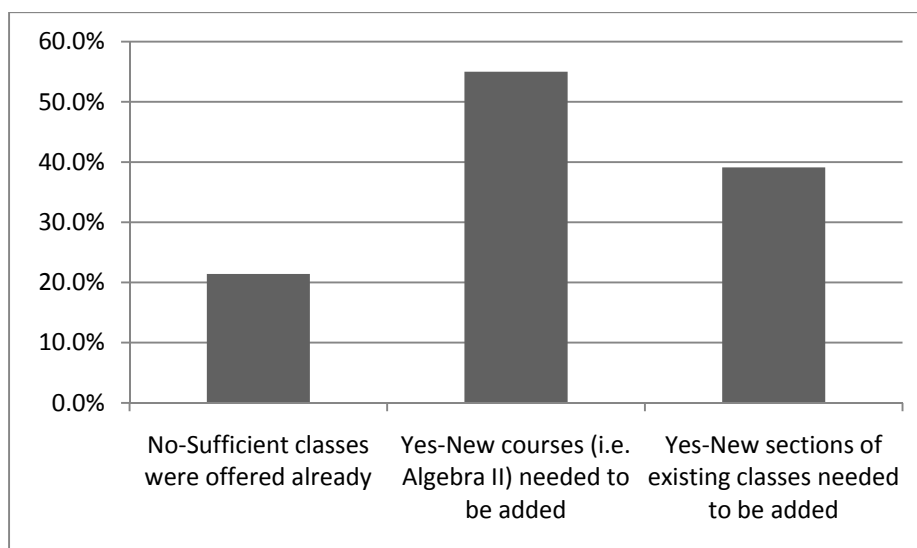


Figure 3. Did your school or district add new courses or sections in response to the Michigan Merit Curriculum?

The types of new courses that were needed were specified by 92 principals in a free response question on the survey. The percentage of principals that mentioned each type of course is illustrated in Figure 4 below. Overwhelmingly, most principals—70%—stated that they needed new math courses such as Algebra II over two years and new senior math alternatives. The next most common subject that required new courses was science (39% of principals), followed by social studies (20%) and ELA (13%). Economics and visual and performing arts were mentioned by 8% of principals that responded, and foreign language courses had been needed by 5% of principals (largely in anticipation of future foreign language requirements). A few principals (8%) also mentioned other courses such as civics, guided academics, test preparation, and courses for transitioning students.

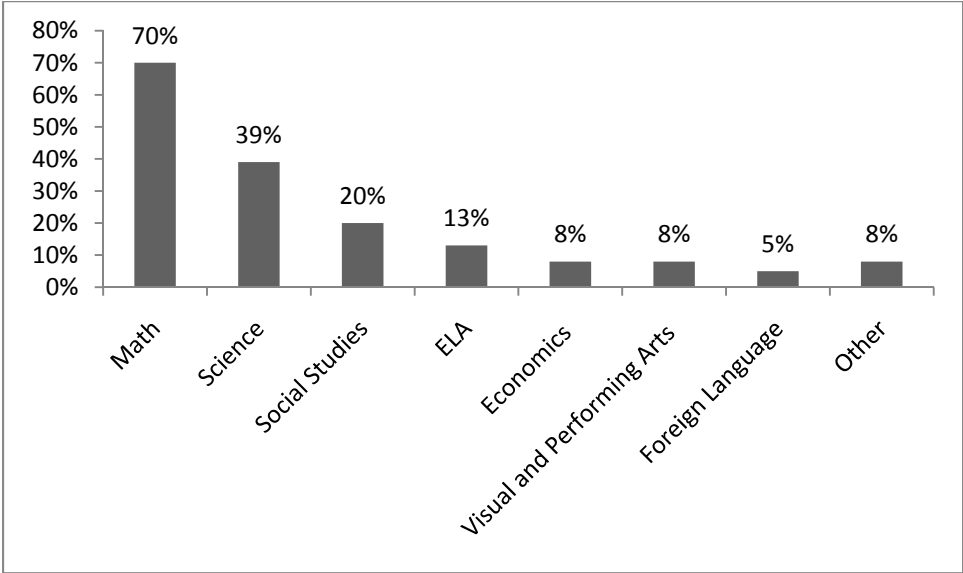


Figure 4. Please specify which new courses needed to be offered.

The need for new courses or sections appears to be tied to school poverty levels. Schools with the lowest student poverty levels were more likely than others to need new courses, but not need new sections of existing courses. Schools with the highest levels of student poverty were much less likely to add new courses than other schools, and were the most likely to not need any additional courses or sections at all. While this may seem counterintuitive, schools with higher poverty levels tend to be those that are already subject to closer supervision and assistance and thus were in a better position to meet the new standards. The relationship between the impact on course-taking and proportion of students qualifying for free or reduced price lunch is illustrated in Table 9.

Table 9. Need for New Courses by Poverty Level of School*

Impact on Student Course-taking	Quartiles of Proportion Qualifying for Free/Reduced Price Lunch				All
	1 st	2 nd	3 rd	4 th	
No New Courses or Sections Needed	14 19.18	11 15.07	14 22.58	10 43.48	49 21.21
New Sections Needed, No New Courses	12 16.44	18 24.66	15 24.19	6 26.09	51 22.08
New Courses Needed, No New Sections	36 49.32	28 38.36	21 33.87	4 17.39	89 38.53
New Courses and New Sections Needed	11 15.07	16 21.92	12 19.35	3 13.04	42 18.18
Total	73 100.0	73 100.0	62 100.0	23 100.0	231 100.0

*Whole numbers represent numbers of respondents. Percentages are column percentages. Differences are statistically significant at the .09 level

Alignment to Standards

One of our online survey questions was, “Have teachers had difficulty aligning their courses to state content standards?” We received 224 responses. Of the principals that answered that question, 54.0% said that teachers did not have difficulties aligning courses to state standards, 45.0% said that teachers had some difficulties, and 7.1% stated that teachers were having difficulties. As seen in

Table 10, standard alignment was related to school location. While 71.4% of principals that self-reported as being in urban locations stated that teachers were not having difficulties aligning courses to standards, this percentage was only 58.1% in suburban schools and 48.8% in rural schools. In addition, 23.8% of urban principals, 32.4% of suburban principals, and 45.0% of rural principals reported some difficulties. Only 4.8% of urban principals, 9.5% of suburban principals, and 6.2% of rural principals said that teachers had difficulties aligning courses to state standards. There does appear to be variation in principal responses depending on school location. Fewer urban teachers seem to have had difficulties, and rural teachers seem to have had the most difficulties aligning courses to state standards.

Table 10. Alignment Issues by Geographical Area*

		Have teachers had difficulty aligning courses to state standards?		
		No	Somewhat	Yes
Location	Urban (n=21)	71.4	23.8	4.8
	Suburban (n=74)	58.1	32.4	9.5
	Rural (n=129)	48.8	45.0	6.2
	All Locations (n=224)	54.0	38.8	7.1

*Numbers represent row percentages

Changes in Staffing

Out of our survey respondents, 15.1% of administrators indicated that they were faced with the challenge of an insufficient number of qualified teachers. Based on the free response answers to other questions in the survey instrument, we concluded that principals interpreted this question in two distinct ways:

1. Did your school have enough existing teachers to staff all courses and sections required by the MMC?
2. Did your existing teachers have enough skill and content knowledge to adequately teach all courses required by the MMC?

This difference complicates the analysis of the response to this question. Some schools may have had enough teachers to staff all of the needed sections and courses, but those teachers were not highly skilled. Some schools may have had highly qualified staffs, but not enough teachers for the new courses and sections they needed to add. Judging by the weak relationship between an indicated challenge with staffing and the need to add new sections of existing courses or new courses⁸, more principals may have interpreted the question in the second manner. However, without directly re-surveying the principals we cannot clearly identify the

⁸ A two-tailed t-test of the difference in means did not produce statistically significant differences. 19.3% of schools who needed to add new sections of existing courses indicated an insufficient number of teachers, compared with 12.4% of those who did not need new sections ($p=0.1460$). 13.7% of schools that needed to add new courses indicated an insufficient number of teachers, compared with 16.8% of those who did not need to add new courses ($p=0.5112$).

interpretation. Whatever the interpretation may have been, there was a strong indication that many schools had to hire new teachers to respond to the pressures of the MMC.

Hiring new teachers can mean increased costs to the school if they find someone new to hire, or an inability to teach required courses if they are unable to find qualified teachers to staff the courses. In interviews, ISD-level staff indicated that they were unaware of any difficulties finding qualified staff to teach courses, even in rural locations. No school-based staff indicated any hardship in finding teachers either. However, due to our sampling method, we may have interviewed a non-representative sample of administrators.

To test which schools indicated a challenge with staffing, we compared the poverty level of schools among the different responses. We found that schools with higher concentrations of poverty were more likely to identify an insufficient numbers of teachers (Table 11). These schools also tend to have a harder time hiring qualified teachers (Jacob, 2007; Lankford, Loeb, & Wyckoff, 2002; Monk, 2007).

Table 11. Indicated Challenges by Poverty Level of School*

Challenge	Quartiles of Proportion Qualifying for Free/Reduced Price Lunch				All
	1 st	2 nd	3 rd	4 th	
Insufficient Numbers of Qual. Teachers**	4 5.26	11 14.86	14 21.54	7 30.43	36 15.13
Poor Student Preparation**	34 44.74	40 54.05	39 60.00	18 78.26	131 55.04
Classroom Space	11 14.47	11 14.86	7 10.77	5 21.74	34 14.29
Online Learning Experience	5 6.58	2 2.70	5 7.69	3 13.04	15 6.30

*Whole numbers represent numbers of respondents. Percentages are column percentages.

**Differences are statistically significant at the p=0.05 level.

In addition to serving more impoverished communities, schools that indicated an insufficient number of teachers also tended to be smaller (539 students v. 810 students; p=0.0039) and were slightly more likely to be rural, though there was not a significant difference (p=0.3494).

A recent study by Keesler et al. (2008) indicated that up to 25% of schools in the state of Michigan could have a potential undersupply of teachers in mathematics, compared with 7% in English, 5% in science, and 4% in social studies given the new graduation requirements, and that these schools would tend to serve larger numbers of students than the state average. Our data tend to suggest that smaller schools have had a greater challenge with insufficient numbers of teachers, and that fewer schools faced the undersupply than was predicted.

Student Preparation

Over half of the principals surveyed (55%) indicated that one of the largest challenges they faced was in regards to student preparation entering high school. These principals indicated that students entering their schools did not have the prerequisite knowledge and skills to be immediately successful in the MMC without substantial remediation and support. To test whether this assertion was based in fact, we compared the Michigan Merit Examination scale scores in math between groups indicating various challenges (Table 12). We found that schools who indicated an insufficient number of qualified teachers and poor student preparation had lower average scale scores than those who did not.⁹ In short, schools who indicated poor student preparation as a challenge have historically been lower-performing. Additionally, students in these schools were more likely to be living in poverty than students in other schools (Table 11).

Table 12. Indicated Challenges by Student Test Scores*

Challenge	MME Math Scale Score		Statistically Significant?
	Indicated Challenge	Did Not Indicate Challenge	
Insufficient Numbers of Qualified Teachers	1091 (1.98)	1097 (0.73)	Yes (p=.0015)
Poor Student Preparation	1094 (0.95)	1099 (0.99)	Yes (p=.0003)
Classroom Space	1095 (1.65)	1096 (0.77)	No (p=.6188)
Online Learning Experience	1095 (4.19)	1096 (0.70)	No (p=.6322)

*p-values are obtained from a two-tailed t-test of a difference in means; Standard errors are shown in parentheses.

Many principals also indicated that a longer period between passage of the legislation and enactment would have been beneficial to students. When the MMC legislation was passed, the first group subject to its requirements was already in eighth grade. As a result, while high schools had time to build higher level courses into their curricula, middle schools had no opportunities to increase student proficiency in key areas, such as math. These principals claimed that as the MMC continues and middle schools begin to feel pressure to reform, student proficiency when entering high school will increase, making it easier to meet the requirements of the curriculum. However, given the relatively small movement in student proficiency in the middle grades over the last several years, it is difficult to discern whether this is possible without major interventions at the middle school level.

⁹ Those schools that indicated that poor student preparation was not a challenge had 2009 MME Math performance in the 75th percentile. Schools that indicated it was a challenge had scores in the 56th percentile state-wide.

School Resources

While at least some challenges were identified for the vast majority of schools, many principals consistently pointed to variations in school resources as a barrier to effective implementation. In Tables 9 and 11, we demonstrated that the poverty level of a school does have a significant impact on the challenges that school might face. Schools with higher concentrations of poverty also tend to have lower test scores and schools with lower-performing students have a greater challenge meeting the requirements of the Michigan Merit Curriculum. Higher concentrations of poverty are correlated with less state funding and a decreased ability to generate revenue locally (Summers-Coty, 2007). Students from lower socio-economic backgrounds also are less able to seek the support of supplementary education services, such as tutors and afterschool programs, which might help offset a lack of resources at the school level.

However, aside from the effects of concentrated poverty on school resources, we were interested in the differential impacts of school location on challenges to implementation. We compared the identified challenges of schools to their self-reported locations. In this analysis, we found that urban schools were significantly less likely to have challenges with adequate classroom space than other types of schools, but significantly more likely to have challenges meeting the requirements of the online learning experience (Table 13). Urban schools in our sample had an average of 291 more students than other schools, and a higher concentration of poverty (a 14 percentage point increase). However, despite the concentration of poverty, these large schools tended not to have problems finding space for their classes to meet. Additionally, urban schools tended to have more computers per student than other types of schools, although not by a statistically significant margin. In contrast, rural schools were significantly more likely to face challenges with classroom space than schools in other settings. These schools tended to serve forty percent fewer students than other types of schools, and did not face higher concentrations of poverty. As a result, it seems that smaller, rural schools are facing problems with adequate classroom space, regardless of the poverty level of the students served. Additionally, larger, urban schools do not have problems with adequate classroom space, but do tend to face problems with the online learning experience requirement (despite a lower student to computer ratio).

While the issues cited here do not by any means constitute a holistic review of school resources, it does suggest that school location and size do have an impact on the challenges an individual school faces when attempting to implement the Michigan Merit Curriculum.

Table 13. Indicated Challenges by Geographic Area

		Challenges to Implementation			
		Insufficient Teachers	Poor Student Preparation	Classroom Space	Online Learning Exp.
Location	Urban (n=21)	14.3	71.4	0.0*	23.8*
	Suburban (n=75)	12.0	46.7	12.0	4.0
	Rural (n=132)	17.4	59.1	18.2*	4.6

All Locations (n=228)	15.1	55.0	14.3	6.3
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*Differences are statistically significant at p=0.05

Local Policy Concerns

Several local school officials that we spoke with indicated that the additional requirements of the MMC would begin to place pressures on certain local policies including, but not limited to, those outlined in Table 14. While none of our interview subjects noted that these were major concerns, they did state that they were issues that local school boards and district offices would have to face in light of the new requirements. In many cases, these issues have been either already discussed at the local level, or are being addressed currently. However, since the Merit Curriculum’s implementation did have a substantive impact on these policies, they thought the concerns were important to note in our report.

Table 14. Local Policy Concerns

Local Policy Issues	
Attendance Policy	New requirements are based on mastery of content, and there is no longer time to fail a course, recover the credit, and graduate on time. If students can pass a course academically, how can LEAs fail students for not attending?
Length of School Year	With budgetary cuts, some districts have begun to offer teachers shorter school years in lieu of pay increases. With higher requirements for student mastery, how can we meet these goals in only 156 school days?
Student Discipline	Success in particular courses depends on student attendance. If students who represent behavior problems are given out of school suspension, how is a school supposed to support them in recovering the lost class time?
Local Graduation Requirements	Many local school districts have local graduation requirements that include students to complete additional work to graduate, e.g. a community service requirement. Is it still feasible for local school districts to require these additional feats from students in light of increased academic rigor?
Calculation of GPA	Students who complete Algebra I in eighth grade must receive credit for that course at their high school. However, due to variation in grading policies at middle schools and the availability of such courses, are high schools required to use eighth grade Algebra I scores in the calculation of GPAs?
Integrated Coursework	The MMC allows students to receive credit for courses through integrated content in other, non-academic courses, e.g. a CTE course. Since CTE teachers will be

potentially providing instruction in other content areas (math, science, etc.), do they need to meet the “highly qualified” NCLB standard for those subject areas too?

Other Issues

- What qualifies as a “math-related” course?
- Is the personal curriculum a justifiably “alternative” option?
- How does a high school grant credit for courses it does not control?

Responses to MMC Pressures

Schools have tried different strategies to meet the requirements of the Michigan Merit Curriculum. While many principals have stated that it is too early to see if these tactics were successful, we have summarized the various responses that schools adopted.

Scheduling Changes

Given that the MMC placed much higher constraints on student schedules than previous curricula, many schools have opted to simply provide more opportunities for students to earn credits by expanding the number of courses they can complete in any given year.

Trimester System

Many high schools also adopted a trimester calendar in lieu of a semester system. This switch has several benefits. First of all, one concern with the Michigan Merit Curriculum was its effect on electives. Because more courses were now mandatory, students would have less freedom in choosing classes. Since the trimester system allows students to take more classes than the semester system, switching to a trimester system can help save room for electives in students’ schedules. One principal shared that the school now had “teachers create new elective courses for the ‘fun’ things they may not be able to fit into the MMC.” As another principal pointed out, trimesters “have allowed for not only more classes, but the opportunity for the struggling student to make up failed classes within the same year to keep pace with their cohort.” In other words, if a student fails a course, he or she would have the opportunity to retake that course in the same year and thus recover credits without needing to spend an extra year (or years) in high school. At one high school, Algebra I is offered both as a two trimester and a three trimester course, while Algebra II is offered either as a two trimester or a two year course. Thus, struggling students would have the option of taking Algebra at a slower pace, while students who have less difficulty with the coursework have more room for electives and other courses. However, not all courses at that school offer the two or three trimester option: Advanced Placement classes remain full year courses. While it is too early to see the impact of switching to a trimester system, this strategy does seem to allow room for more electives and more credit recovery options.

Additional Class Periods Per Day

While switching to the trimester system was a more common strategy, a few schools adopted a seven-hour day instead. Like the trimester system, this tactic would allow students to take a greater number of courses, including more electives or academic support classes.

Block Classes

A few schools have started block classes to help students meet Michigan Merit Curriculum standards. These block classes are usually for ELA and math, especially Algebra. At some schools, only some of the students have block classes. As one principal described, “We have created double block classes for students who struggle to process new learning at the rate of their peers.” One school that adopted the Guided Academics program has double blocks in math, ELA, or Science.

Changing Course Sequence and Timing

Some schools changed the sequence and timing of courses. For example, some schools offer geometry in 9th grade and Algebra I in 10th grade. Other schools allow students to take Algebra I and Geometry simultaneously.

Another trend is to encourage students to take classes they would normally in high school when they are still in middle school. For example, in one district, all students take Algebra I in 8th grade. Another district is attempting to meet the World Language requirement at the 7th and 8th grade level so that elective classes can still be offered in high school. Additionally, in one school environmental science shifted from being a 9th grade required course to being integrated within the 8th grade curriculum so that all 9th graders could be enrolled in biology. Furthermore, another district generally offers the opportunity to take high school classes in 8th grade.

New and Modified Courses

Even though the goal of the MMC was to encourage students to take more rigorous courses already being offered, many schools have created entirely new courses to support students as they complete the requirements of the curriculum.

Two Year Algebra II

One frequent response to the Algebra II and four-year math requirement was to offer Algebra II as a two year course. Doing so makes the course slower-paced, which can reduce the number of students struggling to meet the new requirement. As one principal explained, “We have doubled the time devoted to Algebra for some students. We restart students in the second semester who have struggled with Algebra II in the first semester.”

New Math and Science Courses

To help students meet the new requirements, many schools added new math and science course. Examples of these courses include:

- “A Personal Finance requirement for all seniors, which can count as a 4th year of math as long as the Algebra II requirement is covered. “
- “Algebra I Restart, and the creation of Conceptual Physics.”
- “All freshmen now take an introductory physical science course.”
- “Implementing a more basic Algebra II course and implementing Conceptual Physics to compliment the regular (college-bound) physics that we've offered in the past.”
- “Essentials of Chemistry and Physics course in the ninth grade to help prepare students who normally wouldn't take Chemistry or Physics”
- “A senior financial strategies course as a option for senior math”

Alternatively, one principal shared, “Our Career Center did work to incorporate statistics into all courses so that their senior math requirement is satisfied there.” Such measures were in response to concerns that the math and science class that had historically been offered would be too difficult for students that normally would not have chosen to take additional math and science course prior to the adoption of the Michigan Merit Curriculum.

More Advanced Placement Classes

While less common than adding new math and science classes, some principals mentioned that their schools increased Advanced Placement course offerings, especially for junior and senior electives.

Integrating Online Learning Requirement

Though many schools mentioned the benefits of online classes, some tried to fulfill the online learning experience requirement in other ways. For example, one school “integrated the ‘online learning experience’ rather than having a one-semester computer lit requirement.” Another principal shared, “We surveyed our teachers 6-12 re: online learning for students to ensure that all students were getting the hours required to meet that requirement.” Thus, such schools made sure that students could complete the new online learning standard without having to take a new course.

Online Learning

One of the requirements of the Michigan Merit Curriculum is the online learning experience. For this reason, some schools have added classes such as “Computer 1” to help students fulfill the requirement. Other schools have expanded their course offering using online courses so that students can fulfill all needed electives through programs such as Apex or Nova Net. As one principal explained, the school started an “on-line lab to expand offerings without having to hire additional staff.” Online classes are also frequently used for credit recovery. A popular program that many schools have adopted is E2020. At one school, there is “on-line mastery content recovery for just the content missed” rather than full classes. Principals also mentioned that online classes for both electives and credit recovery are being offered both during the day and after school.

Additional Support for At-Risk Students

A number of schools indicated that they were adjusting to the MMC requirements by offering extra support for those students deemed most at-risk of failure or dropouts. Specific strategies are outlined below:

Early Identification of At-Risk Students

Some high schools are increasing communication with elementary and middle schools so that future incoming high school students are more prepared to begin the Michigan Merit Curriculum and high school staff are more aware of which students may need additional support. For example, one school worked with the middle school to help identify students who are at-risk and intervened with a summer program. One middle school also had an at-risk coordinator for 7th and 8th graders. Naturally, such communication is made easier at the middle and high schools that share facilities and staff (i.e. junior/senior high schools).

Student Counseling, Mentoring, and Tutoring

Many schools offered additional student counseling, especially for at-risk students. These interventions have taken a few different forms:

- Freshman Academy/Transition Programs

- Guided Academics
- Before and after-school tutoring
- Mandatory Math Labs for students failing math
- Teacher/Student assistance program
- AAI - Academic and Attendance Intervention: Each week, for two hours on two different nights, teachers facilitate tutorial sessions for students to get extra help. There are weekly "eligibility" checks on all students, and AAI is encouraged for students that are failing.
- Academic support time built into the end of the day for struggling students
- Academic hold
- Mentor program for at-risk students
- Seat time waiver for expelled or pregnant students
- Remediation and re-testing after-school program
- After-school intervention program for students who are failing one or more classes on a weekly basis
- Teachers “adopt” and mentor at-risk students
- Using Explore (8th grade), Explore (9th grade), and Plan (10th grade) results for early intervention and curriculum revision
- “Pyramid of intervention” approach to intervene with individual students

All of these strategies try to intervene early to help struggling students and provide academic support.

Special Classes for At-Risk and Failing Students

Many principals also reported additional classes for at-risk and failing students. These include academic support classes, Guided Academic classes, remediation classes, credit recovery classes, and focus-study skills classes.

Summer School

Several principals mentioned that summer school was another way that they were helping students adjust to the Michigan Merit Curriculum. One noted that summer school was for math, while another said that the number of summer school options had increased. A different principal stated, “Since our county is number 1 in unemployment, there is no cost for summer school.”

Student and Parent Outreach

Outreach to Parents and Students

Several principals mentioned doing outreach with students and parents. For example, one school held a Freshman Orientation, which was “a night for parents and students to learn about MMC among other things, preparing them for high school.”

Letters Suggesting Alternative Education

As one principal described, “We have an Alt. ed. program (Pioneer High School) and we use it for students falling behind to the extent that they cannot graduate with their peers. Letters urging parents to consider alt. ed. are sent to those falling behind at end of each semester.” Thus, families are informed of educational opportunities that might be better for their children.

Teacher Support and Changes in Teaching Methods

Test Preparation and Continuous Assessments

As part of the transition to the Michigan Merit Curriculum, many schools are developing common assessments, and, in some cases, developing databases to better record student performances. Furthermore, assessments are becoming more common—one principal reported “ACT and MME-like assessments year-round and on a weekly basis.” Many school principals also shared that they have implemented more classes related to test preparation, including some specifically targeted towards the ACT and MME.

Common Planning and Support

Many school principals have also reported more common planning of curricula, both within and across academic disciplines. To facilitate common planning, districts and schools have helped allocate time for teachers to meet and work together. Teachers have also generally begun to support each other more. As one principal shared, “Teachers are also beginning to go into other teachers' classrooms during their own prep periods to assist. We are building common planning time for our staff for data analysis and planning.” In addition, another principal wrote, “I meet quarterly with all of my departments to look at the data and curriculum. We use student grades, common assessments, etc.” There is also a trend towards adopting the “Professional Learning Communities” model, which encourages teachers to share best practices.

Team Teaching

Many school principals also reported an increase in team-teaching in order to help special education students. This strategy usually involves teaming a general education teacher with a special education teacher for classes that are a combination of general and special education students. As one principal shared, this practice “has added a different dimension to the classes and to the expertise of our special education staff.” Another principal whose school has a long history of team teaching wrote, “We have been involved with Co-Teaching for 20 years. Our staff works hard to differentiate instruction to meet the needs of all learners on every level.”

Professional Development

Many principals reported additional teacher training in preparation for the Michigan Merit Curriculum. For example, one principal shared, “ALL math teachers have completed Algebra I and Algebra II training to expose them to new ways of teaching mathematics using technology and manipulatives - this training was offered by the Macomb Intermediate School District to all county teachers.”

Preemptive Application of Standards

A few schools preemptively applied the Michigan Merit Curriculum to earlier cohorts. As one principal shared, “We required students in the year 2008-2009 to follow the MMC. We then responded to potential problems in scheduling and graduation credit issues.” Thus, this trial run helped the school anticipate any issues that could arise when the Michigan Merit Curriculum actually became mandatory.

New Textbooks

Some schools also mentioned that they needed to invest in new textbooks to better implement the Michigan Merit Curriculum. One principal shared that the school spent \$250,000 on textbooks. Another principal mentioned that when school staff were aligning curriculum, they also got new textbooks where necessary. In particular, one principal mentioned that new high school math textbook series had been needed.

Administrator Attitudes Toward the Michigan Merit Curriculum

The Michigan Merit Curriculum frequently led to strong feelings among administrators, but these reactions varied across principals. Most reactions can be summarized by the following:

1. The Michigan Merit Curriculum was a very negative experience and was not a good policy.

- “It is unrealistic to believe that the State can legislate students to pass Algebra II and other more advanced classes. You cannot legislate student achievement!”
- “The MMC had taken local control from school districts, and has created a "one size fits all" approach to education in Michigan.”

2. The Michigan Merit Curriculum was a good idea and is working well.

- “I fully support the higher course standards and see it as a way for all of our students to be successful at some point in the future. Our culture has changed from a manufacturing base to an information/service based economy. If we do not prepare our students for this kind of global economy, we are only shortchanging them.”
- “In general, I am very supportive of the new graduation requirements, and believe that they will have positive results for our students.”

3. The Michigan Merit Curriculum was a good idea, but there could be improvements in implementation.

- “Stay consistent and develop different pathways, so students who have differing learning styles have the ability to graduate from high school with a state endorsed diploma.”
- “We need the State to provide quality end of the course assessments for every MMC class and it has to be aligned to the ACT. If we had this, it would allow us to work backward to create proper pacing guides and concept maps for each course. As it stands, Districts are creating their own assessments- many of which are not of high quality and their results on the MME show it.”
- “Too politically motivated - decisions were made because lawmakers wanted Michigan to lead the nation with respect to academic requirements, but the applying these requirements to all students is not necessarily in the best interest of all students. The personal curriculum component is a mess. While the idea behind it is a good one, the practicality of its implementation is not there.”
- “For the most part, this is an excellent change for our kids and our state. We are struggling now, due to the budget reductions, to provide electives for students. We are bound by the MMC, but our schedule is changing next year to save money and freshmen will have difficult choices and few options outside of the basic MMC. We lose out when students can't take art and music. Our state and our country suffer because of lack of creativity and innovation, yet we are weakening our position more than ever because of the choices we are forced to make in this budget crisis.”
- “I don't have a problem with the state asking for a tougher curriculum. The only item I would like to see removed is Algebra II. Otherwise no problem of what is being asked.”

Conclusion

Our survey findings suggest that the Michigan Merit Curriculum has led to widespread changes in high school course offerings and student course-taking. Based on data from Macomb County, it appears that while these new standards have led to increased course failure rates, the enrollment rates in more challenging courses have grown substantially more than the increases in failure rates. Thus, while the new curriculum is detrimental to some students, most students that are now taking more challenging classes are doing relatively well.

Schools have encountered a number of challenges when attempting to implement the Michigan Merit Curriculum, such as insufficient qualified teachers, poor student preparation, and inadequate funding and resources. These are often partly tied to other factors, such as poverty rates and geographic location. To meet the challenges of the Michigan Merit Curriculum, schools have tried several strategies, including altering scheduling, adding and modifying courses, providing additional support to at-risk students, conducting outreach to students and teachers, providing additional teacher support, and changing teaching methods.

Administrator attitudes to the Michigan Merit Curriculum have been mixed. While some administrators are frustrated with the new standards, others have expressed support. By far, most administrators indicated support for more stringent graduation requirements, but suggested changes in implementation such as better funding, removing the Algebra II requirement, and the addition of other curriculum and certification tracks.

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Appendix A. In-Person Interview Questionnaire

Part I. Implementation of the Curriculum

1. To what extent has the MMC changed the courses offered in schools?
2. Has the MMC changed course-taking patterns in schools?

Part II. Alignment of the Curriculum

1. How closely do newly required courses mirror the state High School Content Expectations, especially in advanced courses like Algebra II?
2. What local supplements have been put in place to help teachers align their course offerings to the state standards?
3. Do you believe proper alignment is more/less of an issue in a(n) urban/suburban/rural district because of the population being served?

Part III. Challenges to Implementation

1. What are the major challenges your school/district/ISD faced when implementing the MMC?
2. Did your school/district/ISD face challenges in any of the following areas when implementing the MMC?
 - a. Staffing subjects, especially math and science
 - b. Space constraints
 - c. Meeting the requirements of the online learning experience
 - d. Poor preparation in the early and middle grades for higher level content in high school
3. How has your school/district/ISD responded either proactively or retroactively to address/avoid those challenges?

Part IV. Other Comments

Appendix B. Online Survey Questionnaire

Question	Potential Responses	Potential Follow-up Questions
Please state your school code.	[Free Response]	
Please state your school district name.	[Free Response]	
Please state the name of your high school	[Free Response]	
Please describe the area where your school is located.	a) urban b) suburban c) rural	
Please provide an estimate of how many students attend your school.	[Free Response]	
Did your school or district add new classes in response to Michigan Merit Curriculum requirements?	a) No – sufficient classes were offered already b) Yes – new courses (e.g. Algebra II) had to be offered c) Yes – more sections of existing courses had to be offered	Answered b → Please specify which new courses had to be offered. Answered c → Please specify which courses needed additional sections.
Are sufficient classes now being offered to fulfill Michigan Merit Curriculum requirements?	a) Yes – there are currently enough classes to fulfill requirements b) No – more classes are needed to fulfill requirements	Answered b → Please specify which classes are needed to fulfill requirements.
Are course-taking patterns among students changing because of the Michigan Merit Curriculum?	a) Yes – significantly more students are taking more challenging courses b) Somewhat – some more students are taking more challenging courses c) No – most students were already taking classes now required by the Michigan Merit Curriculum d) No – insufficient classes are being offered for students to fulfill the requirements of the Michigan Merit Curriculum	Please describe in more detail how course-taking patterns among students have changed.
Have teachers had difficulty aligning their courses to state content standards?	a) No b) Somewhat c) Yes	Answered b or c → Please describe any difficulties that teachers have faced.

What are some challenges in implementing the Michigan Merit Curriculum?	<ul style="list-style-type: none"> a) Insufficient qualified teachers for required classes b) Insufficient student preparation to take required classes c) Insufficient classroom space for required classes d) Fulfilling the online learning experience requirement e) Other
Please describe any challenges your school has faced.	[Free Response]
What are some successful strategies your school or district has adopted to implement the Michigan Merit Curriculum?	[Free Response]
Do you have any recommendations for better implementing the Michigan Merit Curriculum?	[Free Response]
Do you have any other comments about the Michigan Merit Curriculum?	[Free Response]