

Mathematics Vision Project (MVP) High School Curriculum Evaluation

Submitted to the
Wake County Public School System

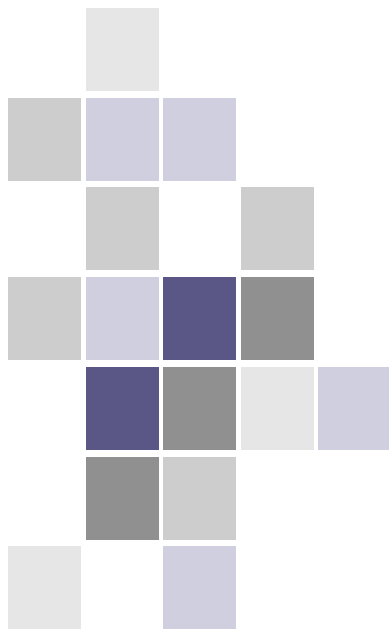
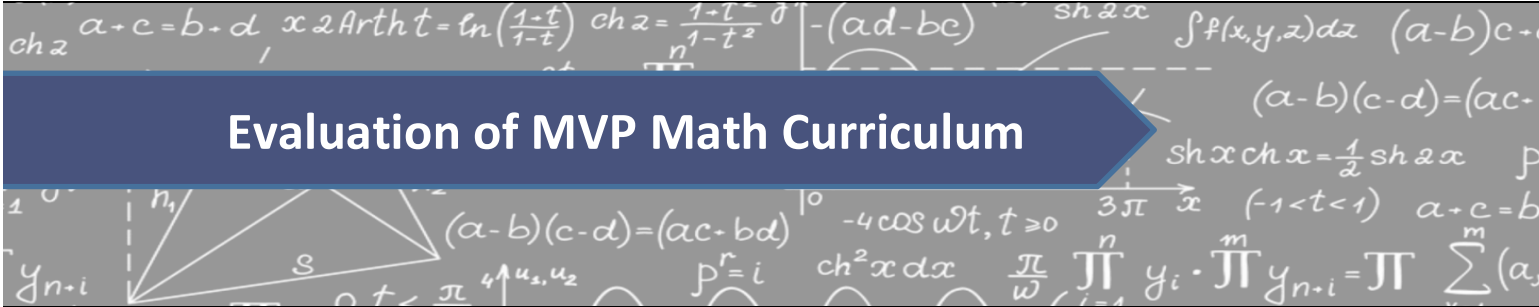


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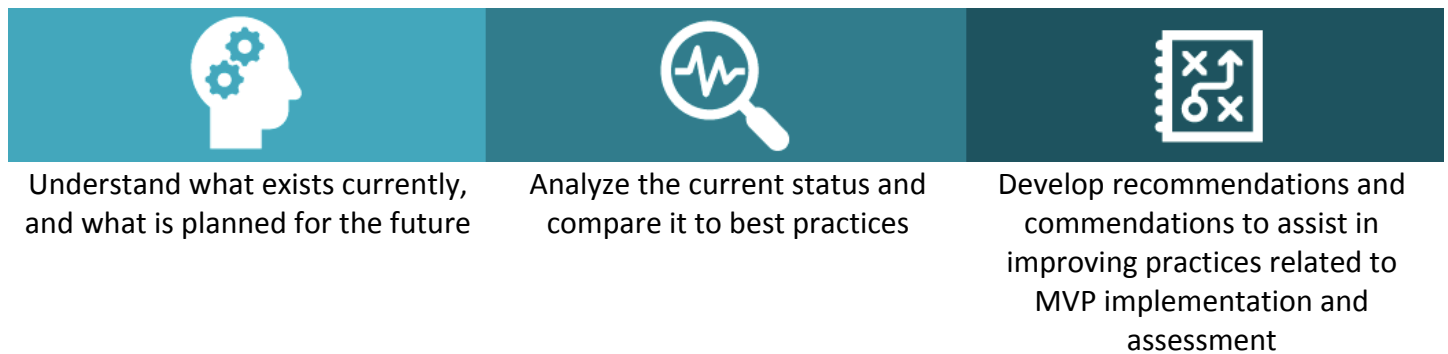
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Evaluation of MVP Math Curriculum

In September 2019, Wake County Public School System (WCPSS) contracted with MGT Consulting Group (MGT) to conduct a study of the Mathematics Vision Project (MVP) high school curriculum in a representative sample of WCPSS middle and high schools. The purpose of the study was to assess the current level and quality of implementation of the MVP curriculum, and to analyze the curriculum in comparison to best practices in mathematics. The primary goal of the study was to provide the school district with a set of recommendations on the future use of the curriculum based on the findings from the study of its current use.

MGT’s approach to this work was based on best practices for program evaluation and consisted of three phases:



MGT began the study by conducting diagnostic interviews with district leaders to ensure that we had a beginning picture of what’s working, what’s not, and what, if any, other issues or concerns WCPSS would want us to be aware of prior to conducting the study. This information was used to prepare for on-site work, data gathering and analysis.

During the study, MGT gathered information on the MVP Math Curriculum directly from stakeholders, including focus group interviews with teachers and students, individual interviews with school and district administrators and online surveys of parents of students enrolled in MVP classes and observations in MVP Math classes. In addition, the MVP Math Curriculum was evaluated for focus, coherence, and rigor using the Instructional Materials Evaluation Tool (IMET). The graphic below represents each of these data gathering activities.



139 Classroom Observations in a sample of 23 middle and high schools



23 School Administrator Interviews
31 Participants



Online Parent Survey
3125 Individual Responses



23 Teacher Focus Groups/
161 Participants



23 Student Focus Groups/
178 Participants



Review of the MVP Math Curriculum Using the IMET Protocols

MGT's findings and recommendations are the result of the triangulation of this data.

FINDINGS

MGT's findings are in the form of commendations for areas of the MVP Math Curriculum that are notable and reflective of best practice, challenges for areas that are in need of improvement, and recommendations that accompany the challenges.

COMMENDATIONS

Commendation 1: The approach to math instruction advocated by the MVP Math Curriculum is representative of best practices. The curriculum's focus on teaching students to think mathematically, and its emphasis on balancing procedural fluency with conceptual understanding of math encourages and strengthens problem-solving skills.

Commendation 2: There is high level of fidelity in the implementation of the MVP Math Curriculum throughout the district. Across the 23 middle and high schools visited, use of the curriculum in

accordance with its design was evident in Math 1, 2, and 3 classes. The hallmark features of the MVP curriculum that were in high evidence included:

- **Productive struggle.** Throughout the classroom observations, students were observed engaging in productive struggle. As problems were displayed on document cameras, or through lesson review using the student workbooks, questioning back and forth between and among students and teachers continued throughout the problem solving process. When faced with math problems they could not immediately solve, students were encouraged to first talk through the problem with other students in their groups, and identify why they were not getting to the answer. Teachers circulated throughout the classroom, listening to these conversations, and continued to probe with additional questions, restated or rephrased student comments and questions, redirected students to mathematical formulas, definitions, or other prior knowledge to help them solve the problem.
- **Use of the Ready, Set, Go protocols.** In both classroom observations, and focus group interviews with teachers and students, there was clear evidence of both understanding and use of these protocols in both homework and classwork assignments. This protocol featured the spiraling of skills so that teachers both referenced back to previously taught skills and their application to the lesson being taught during the observation, and referencing future lessons that would build on the skill.
- **Ample student discourse and discussion of mathematical concepts.** Teachers had structured the classroom environment with desks and/or tables arranged for students to sit in pairs or groups of 3 to 5 in order to facilitate discussions of the MVP Math problems throughout the lessons. In some classes, the flow of these discussions were loosely structured without clear delineation of when the conversations were on target or when they were not; however, in most classes, teachers maintained a tighter structure with clear time limits, a clearly communicated purpose of the discussion, and continuous monitoring of the conversations by the teacher throughout the lesson.
- **Use of mathematical language.** During observed lessons, there was an abundance of mathematical language used by teachers and students throughout the lessons. Teachers had anchor charts and word walls that were displayed around the room for ready reference. When new vocabulary was introduced, students took notes in their workbooks.
- **Use of recommended MVP Math Curriculum materials.** MVP materials were being used consistently by teachers and students throughout the observed lessons. Systems were well established for the distribution of the student workbooks, and teachers and students were familiar with the additional available online resources. Teachers used the planning guides in preparation of daily lessons and, during focus group interviews, shared how they had modified and enhanced these tools over the years of MVP implementation to improve their utility and impact.

CHALLENGES

The implementation of the MVP Math Curriculum does not provide sufficient supports for students of varied ability levels to access the curriculum at the appropriate level of challenge. The MVP Math Curriculum is structured in a way that is dependent on the concept of productive struggle. Students are

expected to use their prior math knowledge and skills and build a conceptual understanding of math that they then can use as they acquire new math skills. During classroom observations, focus group interviews, and in the comments from parent surveys, it was evident that for students who had not been previously exposed to this conceptual approach to math instruction, the MVP Math Curriculum represents a challenge. During classroom observations where there were a majority of students who had not had this prior exposure, the lessons were not effective and students were not engaged. In these classes, the group discussions were off task and classroom management was often problematic.

The MVP Math Curriculum requires supplementation and scaffolding in order to make the curriculum accessible to students of all ability levels. Through the classroom observations, focus group interviews and IMET assessment of the MVP Math Curriculum, it was evident when not appropriately supplemented, the MVP Math Curriculum was not sufficient to meet the learning needs of students of all ability levels. In the years since its initial implementation, supplementary materials and activities have been developed by WCPSS as well as individual teachers in order to increase the accessibility of the curriculum to all students. ‘

In terms of MVP Math Curriculum accessibility, there remains a challenge in scaffolding instruction appropriately for Limited English Proficient students and Students with Disabilities. This challenge can be addressed through a combination of differentiated professional development for MVP Math teachers and provision of appropriate supplementary materials for these student populations.

Messaging around the MVP Math Curriculum implementation has produced confusion, specifically around the topic of supplementation. The messaging about the implementation of the MVP Math Curriculum has been mixed since its inception and there is not a clear understanding of expectations around curriculum delivery and modification. One of the perceptions/criticisms of the MVP curriculum by parents and other stakeholders is that students are required to “teach themselves” and that teachers are not providing sufficient instruction when students struggle with mastering math concepts. Part of this perception is supported by conflicts between the initial training on the MVP math curriculum that emphasized strict adherence to the curriculum without modification, and subsequent messaging that advocated modifications and supplementation. While the district has addressed this through the creation and distribution of such adaptations to the curriculum, there still remains some confusion among stakeholders on this topic.

RECOMMENDATIONS

Provide an informational campaign on the MVP Math Curriculum for both schools and parents. In the online survey and during the focus group meetings, parents stated that they did not receive information about curriculum prior to its implementation, and learned of it primarily through what their children shared and/or after making inquiries of their children’s teachers. At this stage in the MVP implementation cycle, it would be beneficial to have an informational campaign that would clearly specify the philosophy behind the curriculum, what the enacted curriculum looks like in practice, the benefits of the curriculum to enhancing students’ conceptual understanding of mathematics, and a Frequently Asked Questions informational document that addresses issues and concerns raised by parents over the past several years. This campaign should also include greater communication to

parents about the resources developed by the district that can help them support their children at home.

Deploy MVP Math teachers who successfully champion the program through both the quality of their daily instruction and their students' performance on math assessments, to become instructional coaches for the program throughout the district. During MGT's classroom observation in the 23 middle and high schools in the study, there were teachers who were implementing the curriculum with high degrees of both fidelity and quality and have found ways to reach students of a variety of ability levels and help them access the curriculum successfully. The practices in these classrooms need to be shared through formal and informal networking both in person and electronically throughout the district in order to provide additional support for teachers' effective implementation of the curriculum.

Continue to build supplementary resources to improve the accessibility of the curriculum for students of all ability levels. The district has begun this process, but it needs to be expanded so that there are readily available resources and materials for teachers working with students who lack a foundational understanding of mathematics. This should include providing a greater number and variety of MVP Math practice problems, and a larger bank of North Carolina Math Standards-aligned practice assessment questions for use during formative assessments throughout the school year.

Examine the structure of the curriculum and mathematical practices at the K-8 level and make modifications necessary to strengthen students' foundational math skills. Although the scope of MGT's work did not encompass an exploration of the math curriculum at the elementary level, it was evident through classroom observations and focus group interviews, that there are a number of students who come into middle and high school without the skills necessary for them to be successful in math at that level with additional supports.

Assessment of MVP Math Curriculum

MGT consultants evaluated the MVP Math Curriculum using the Instructional Materials Evaluation Tool (IMET). The tool is designed to help determine whether instructional materials are aligned to the North Carolina Standard Course of Study for Mathematics. The ITEM tool contained three components that were used in the evaluation of the MVP Math Curriculum. These components were:

- Focus: Are the areas of focus in the MVP curriculum aligned with the NC Standards focus areas?
- Coherence: Is there a linkage across the grade levels of the major topics within each grade level?
- Rigor: In major topics, does MVP Math Curriculum promote conceptual understanding, procedural skill and fluency, and application with equal intensity?

In conducting the evaluation of the MVP Math Curriculum, MGT consultants followed the protocols specified in the IMET, and the following actions were taken in compliance with those protocols.

- Assembled copies of all MVP Math Curriculum Materials for every grade level using the curriculum
- Obtained a reference copy of the North Carolina Standard Course of Study for Mathematics
- Reviewed all protocols of the IMET, including all criterion of the tool.

The findings of the IMET review of the MVP Math Curriculum are included in this section of the report. The full tool with detailed descriptions of each of the areas of evaluation is included in the appendix of this report. The table below displays the overall findings from the IMET review of the MVP Math Curriculum. The results of MGT’s review of the MVP Math Curriculum using the IMET protocol are shown in the table below. As shown in the table, the curriculum met three of the four criteria, and met the overall alignment criteria.

Non-Negotiable Criteria	Alignment Criteria		
Non-Negotiable 1: Focus and Coherence	Alignment Criterion 1: Rigor and Balance	Alignment Criterion 2: Standards for Mathematical Practice	Alignment Criterion 3: Access to Standards for All Learners
	*Points: 5 of 6 possible.	*Points: 5 of 6 possible.	*Points: 4 of 6 possible.
<input checked="" type="checkbox"/> Meets <input type="checkbox"/> Partially Meets <input type="checkbox"/> Does Not Meet	<input checked="" type="checkbox"/> Meets <input type="checkbox"/> Partially Meets <input type="checkbox"/> Does Not Meet	<input checked="" type="checkbox"/> Meets <input type="checkbox"/> Partially Meets <input type="checkbox"/> Does Not Meet	<input type="checkbox"/> Meets <input checked="" type="checkbox"/> Partially Meets <input type="checkbox"/> Does Not Meet
Alignment Criteria Overall: <input checked="" type="checkbox"/> Meets <input type="checkbox"/> Does Not Meet			

*Must score at least 5 of 6 points to meet alignment standard.

Onsite School Visits

MGT used a structured observation protocol during its visits to 14 high schools and 9 middle schools across all nine regions of the school district. Each visit consisted of the following:

- **Classroom observations.** MGT consultants conducted classroom observations using a structured observation checklist designed to assess the fidelity of implementation of the MVP Math Curriculum, and the employment of the *Eight Effective Mathematics Teaching Practices*¹. Consultants were provided copies of the bell schedule at each school, and observations were conducted across all class periods. Classes for Math 1, 2, and 3 were observed and included courses structured for both semester-long and year-long duration. Consultants also observed co-taught classes that support Students with Disabilities, and sheltered instruction classes that supported Limited English Proficient students.
- **Structured individual interviews with school administrators and instructional supervisors.** At each school this included one or more of the following participants: school principal, assistant principal with responsibilities for supervising the math department, and the instructional coach/facilitator for mathematics.

¹ National Council of Teachers of Mathematics. (2014). Principles to actions: Ensuring mathematical success for all. Reston, VA: Author.

- **Teacher focus group interviews.** A structured interview was conducted with a group of teachers responsible for instruction in MVP Math courses. Teachers represented a range of years of teaching experience and included teachers who had been teaching MVP since its inception in the district and some who had only been working with the curriculum for a few months.
- **Student focus group interviews.** A structured interview was conducted with a group of students who were currently enrolled in an MVP Math course. At the middle school level, this consisted of MVP Math 1 students, and at the high school level, students taking Math 1, 2, and 3. Schools were instructed to provide a range of 8 to 10 students, and informed consent forms were provided to schools so they could obtain parental permission for student participant in the focus group.

Classroom Observations

As previously stated, MGT conducted classroom observations in 139 classrooms across 23 WCPSS middle and high schools. MGT consultants used a structured classroom observation checklist that examined the implementation of the MVP Math Curriculum in four domains:

- **Program Fidelity.** The extent to which program components are delivered as prescribed in the teachers’ manual. This includes the core content, methods, and key activities. Although adaptation may be necessary, it is important to understand the potential risks of adapting the program curricula. For example, eliminating program content and reducing the number of program sessions can reduce the effectiveness of a program, whereas adding materials such as culturally relevant examples and materials that do not change the purpose of the sessions may actually improve program outcomes.
- **Program Delivery.** The extent to which program implementers are supportive and prepared for lessons (Pence, Justice & Wiggins, 2008). Teachers need to demonstrate familiarity with the content, methods and strategies to achieve the program objectives.
- **Program Resourcing.** The extent to which critical features that distinguish the program are present. This may include technology resources and consumables.
- **Program Support of Varied Learners.** The extent to which program implementers utilize the program’s resources to support students with varied learning needs. This includes utilization of differentiated activities, tasks or products, as well as the inclusion of multi-modal teaching techniques to support student learning.

Within each of these domains were a series of specific performance indicators, each of which were rated on a 4-point Likert based on the degree to which they were evident during the classroom observations.

4	3	2	1
Very evident throughout the class session	Evident during most, but not all of the class session	Evident during a limited portion of the class session	Not evident to any degree during the class session

Program Fidelity: Rating – 3.1

This was the highest rated of the four domains. Six of the seven indicators within this domain were scored as a “3” or higher. Within this domain, the highest rated indicators (3.5 each) were *Curriculum scope and sequence utilization is evident*, and *Recommended materials are present and utilized*. Use of the MVP curriculum was evident throughout the majority of the observed lessons, along with the recommended strategies of the program. These included:

- **Student use of the MVP workbooks.** Students were observed taking notes from teacher lectures, working out sample problems, copying algebraic formulas, and writing math vocabulary words and definitions.
- **Use of the Ready, Set, Go (RSG) MVP Protocols. Teachers** regularly referenced the RSG process throughout lessons, and students were very familiar with this program structure. The protocol was observed through the review and explanation of homework assignments, student group discussions and problem-solving, and teacher explanation of either a culminating portion of the present unit of study, or preview of an upcoming unit.
- **Facilitation of the Productive Struggle Protocol.** The evidence of this protocol was most notable during question and answer exchanges between teachers and students, and during observations of student conversations and problem-solving with their peers. Teachers asking leading and challenging questions in response to both incorrect responses from students, as well as “why” and “what if” questions when students answered correctly, to check the depth of understanding and to ensure that the response was not just a “lucky guess” or an answer procured from a classmate during the group discussions.
- **Demonstration of the *Eight Effective Mathematics Teaching Practices*.** In virtually all of the classes observed, teachers demonstrated one or more of the following practices. The practices in bold were the most frequently observed.
 - **Pose purposeful questions.**
 - Build procedural fluency from conceptual understanding.
 - **Support productive struggle in learning mathematics.**
 - Establish mathematics goals to focus learning.
 - **Implement tasks that promote reasoning and problem solving.**
 - Use and connect mathematical representations.
 - Facilitate meaningful mathematical discourse.
 - **Elicit and use evidence of student thinking.**

The indicator for which there was the least observed evidence was *Deviations and adaptations are present and work well to enhance learning*. During structured interviews with teachers and school and district administrators, participants noted that during the initial year of the MVP Math Curriculum implementation, trainers emphasized the importance of strict adherence to the program, with no supplementation or variance. In the ensuing years, teachers have made strategic modifications to the implementation of the curriculum and have used supplemental materials to support learner needs; however, in most classes, little of this deviation was evident. In instances where there was not sufficient scaffolding of the curriculum or the learning activities to help students increase their mathematical understanding, some students were not able to successfully participate in the productive

struggle. This was especially true in Math 1 classes at the high school level and Math 1 Foundations classes that were designed to support students who struggle with math.

Program Delivery: Rating – 3.0

Program Delivery, was the second highest rated domain based on the classroom observations. Five of the eight indicators were rated as a “3” or higher. The two highest rated indicators in this domain were *Demonstrates familiarity with the content of the lesson and its sequence* (3.7) and *Uses mathematical language during class discussions (students and teachers)* (3.5). Among the most common behaviors demonstrated during the classroom observations were:

- Definition and use of mathematical vocabulary. Across the observed classes, teachers and students regularly used and discussed the vocabulary used in the MVP student workbook and in the taught lesson. Students also wrote vocabulary words and definitions with which they were not familiar. A sample of the vocabulary used during observed lessons is shown in this display.
 - Inequalities
 - Polynomials
 - Roots
 - Fractured form
 - Multiplicity
 - Leading coefficient
 - Quadratic
 - Parabola
 - Function
 - Quadrilateral
 - Parallelogram
 - Congruent
 - Perpendicular
 - Consecutive angles
 - Domain
 - Range
 - Input
 - Output
 - Set notation
 - Interval notation
 - Function notation
 - Recursive
 - Perimeter
 - Area
- Teacher understanding of the philosophical foundation of the MVP Mathematics Curriculum. During both the classroom observations and teacher focus group interviews, it was apparent that through a combination of years of experience with the MVP Math Curriculum (and of being a math teacher), teachers demonstrated a significant fundamental understanding of the philosophy and structural components of the curriculum.

The lowest rated indicator within the Program Delivery domain was *Communicates the objectives of the lesson in student-friendly language* (2.4). Ratings for this indicator had one of the highest contrasts in scores, with 11 schools having a rating of “2” or below, and 12 schools have a rating of at least 2.1 or above.

Program Resourcing: Rating – 2.5

Program resourcing was one of the weaker domains based on classroom observations. Only one of the indicators had a rating of “3” or higher--*Program resources including textbooks, workbooks and other resources are present and utilized by students in meaningful ways to support learning.* (3.3)—while the other two indicators were rated as 2.4 (*Any technology used by students and teachers enhances learning*) and 1.9 (*Teachers use the program in a way that maximizes student choice within appropriate parameters to foster improved focus and engagement*) respectively. Among the most common behaviors demonstrated during the classroom observations were:

- **Technology Use by Teachers.** Teachers’ technology use consisted primarily of the document camera to project pages in the students’ MVP workbooks and work through math problems as a class. When projecting the workbooks, teachers focused on helping students work through

the math scenarios to identify the actual math problem embedded in the narrative. The document camera was also used by teachers to illustrate how to solve math problems. In this instance, teachers would typically have students direct them through the steps of solving the problem, i.e., tell them what to write in each step of an equation. During these uses of the document camera, students were directed to take notes, highlight passages in their workbooks, and/or underline or circle key passages in the name scenarios to help them better identify the underlying math problem.

- **Student Use of Technology.** The most frequently used technology by students was graphing calculators, and teachers had well-organized procedures in place for the distribution and collection of the calculators. During classroom observations, students were using their laptops for additional problem-solving practice, using programs such as DESMOS and Khan Academy. In some instances, students were taking practice formative assessments or re-taking assessments in an attempt to improve their performance.

The lowest rated indicator in this domain echoes the finding of previous domains with regards to fostering student engagement--*Teachers use the program in a way that maximizes student choice within appropriate parameters to foster improved focus and engagement.* In most classes there was little in the way of differentiation or scaffolding, and students were working on common assignments.

Program Support of Varied Learners: Rating – 2.0

This domain had the least evidence of effective practices based on classroom observations. All four indicators were rated below “3” and two of the lowest rated indicators were, *Lessons have multiple entry points and content is scaffolded to allow student access to content at the appropriate level of challenge/rigor* and *Strategies are utilized to improve learning outcomes for all student subgroups (e.g., English Language Learners, Students with Disabilities, etc.)*. Each of these indicators had a 1.7 average rating. Among the most common behaviors demonstrated during the classroom observations were:

- **Lack of differentiation of lesson tasks and activities to allow students to access lesson content at the appropriate level of challenge.** The MVP Math Curriculum’s core premise of productive struggle can be an insurmountable one unless additional instructional supports are provided for students to be able to access the conceptual framework of an MVP math lesson. In classes where students were not meeting this challenge successfully, there was not sufficient scaffolding of MVP lessons to allow students to successfully engage in the learning process.
- **Insufficient differentiation of instructional strategies to support learning for all student subgroups.** In addition to the MVP Math lessons in general education classes, MGT consultants observed co-taught classes for Students with Disabilities (SWD), and a small number of sheltered instruction classes for Limited English Proficient (LEP) students. In these classes the same challenges as described in the previous bulleted statement were evident.

Focus Group and Administrative Interviews

MGT consultants conducted structured interviews with principals at each of the 23 WCPSS middle and high schools sampled for this study. In schools where an assistant principal had primary responsibility for the supervision of the math department, that individual was also interviewed. The administrators at each school were asked a series of questions to determine their experiences and perceptions of the

implementation and impact of the MVP Math Curriculum in their schools. Each of the schools has been implementing the MVP Math Curriculum for at least three years. The teachers in the focus groups had an average of 10 years experience teaching math, and experience levels ranged from less than one year to more than 30. Focus groups ranged in size from 2 to 12, based on the number of MVP courses taught in the school. Student focus groups ranged in size from 5 to 12 and included students in foundational Math 1 classes to Math 2 and 3 Honors classes. Table 1 summarizes the responses to the focus group interview questions.

Table 1. Summary of Responses to Principal and Focus Group Interview Questions

<p>Supervision of Math</p>	<p>Administrators with primary responsibility for the supervision of the math program conduct the following activities on a regular basis as a part of their duties in this area:</p> <ul style="list-style-type: none"> • Conduct classroom walk-throughs and formal observations of math classes and provide feedback to teachers • Provide support for collaborative planning time and participate in the PLT meetings • Adjust the master schedule to keep the number of lesson preparations to a minimum • Attend district math meetings and communicate curriculum-related updates to math teachers • Assist in interviewing and hiring of new math faculty when vacancies occur
<p>Impression of the MVP Math Curriculum</p>	<p>Impressions of the MVP Math Curriculum were mixed, but tended to be positive overall. Specifically:</p> <ul style="list-style-type: none"> • The strength of the curriculum is its focus on building students’ conceptual understanding of math and not just seeing the subject as the memorization of formulas and problem solving. • The MVP Math Curriculum has really pushed students in a positive way and the conversations that students have to engage in as a part of the curriculum have been beneficial.
<p>Teachers’ Perception of the MVP Math Curriculum</p>	<p>School administrators stated that teachers’ perception of the MVP Math Curriculum has been mixed, with some embracing the conceptual approach to teaching math, and others still harboring reservations about the curriculum’s appropriateness and effectiveness. Overall, most administrators felt that teachers’ perceptions of MVP Math were more positive than negative. Concerns that teachers have expressed to school administrators include the following:</p> <ul style="list-style-type: none"> • Mixed messaging from the district regarding the practice of supplementing the curriculum, e.g., initially strongly stating that the curriculum had to be strictly adhered to without modification, then later relaxing that requirement. • Some teachers feel that for students who struggle with reading, and/or do not possess a strong foundational understanding of math, the MVP Math

	<p>Curriculum is especially challenging, and they are challenged to meet the needs of these students using the curriculum.</p> <ul style="list-style-type: none"> • The amount of planning required to implement the curriculum is greater, but the rewards of seeing the deeper level of understanding of math that students gain through the MVP Math Curriculum has been very rewarding. <p>Teachers’ stated impressions of the MVP Math Curriculum were mixed and discussions around the curriculum centered mainly around the following:</p> <ul style="list-style-type: none"> • Some teachers expressed the view that the MVP Math Curriculum is better suited to stronger math students, particularly honors, but does not support the learning needs of students with poor reading skills, and/or who lack fundamental math knowledge and skills. • Conversely, some teachers felt that the productive struggle component of the MVP Math Curriculum was especially beneficial to struggling students because it deepened their level of mathematical thinking and understanding. • Nearly all teachers felt the curriculum lacks sufficient numbers of practice items for students who need additional exposure to a particular math skill. They also stated that the curriculum requires a great deal of planning and looking ahead in the math units in order to adequately prepare lessons that engage students in the type of mathematical thinking required by the curriculum.
<p>Parents’ Response to the MVP Math Curriculum</p>	<p>School administrators reported having minimal parental response to the MVP Math Curriculum. For those who have expressed concern, once they spoke with their child’s math teacher or to a school administrator, they have stated that they trust the school to do what is best for the students. When parents did express concern, they centered primarily around two areas:</p> <ul style="list-style-type: none"> • Some parents perceive the curriculum as requiring students to teach themselves, and that the teachers are not doing their jobs in providing direct instruction and helping students learn the math. • The MVP Math Curriculum presents challenges to parents’ ability to support their children with homework assignments; some have shared that they have hired tutors to provide additional support. <p>Generally, teachers stated that they had not received significant feedback from parents regarding the curriculum. This was more frequently the case at the middle school than at the high school. Other responses included:</p> <ul style="list-style-type: none"> • The experiences that teachers most often cited were with parents expressing frustration with an inability to help their children at home, and the additional cost and inconvenience of hiring tutors. Teachers frequently referred parents to the district-developed online resources to help parents work with their children. • Parents who had questions or concerns about the MVP Math Curriculum felt more positive about the curriculum after talking with

	<p>teachers or other school personnel and having the philosophical rationale of the curriculum explained to them.</p> <ul style="list-style-type: none"> Some parents still struggle with their understanding of the “Ready, Set, Go” MVP protocol, but again, once they received an explanation of the procedure, most parents were satisfied and understood or had faith that the school was doing the right thing with the curriculum and their efforts to help students master the concepts.
<p>Students’ Response to the MVP Math Curriculum</p>	<p>School administrators reported that students’ responses have been “all over the board” regarding the MVP Math Curriculum. In summarizing these responses, administrators stated the following:</p> <ul style="list-style-type: none"> Students with strong math ability and foundational mastery of mathematical concepts are having the best experiences with productive struggle. Students who lack strong foundational understanding of math concepts and students who struggle with reading are particularly challenged by the MVP Math Curriculum. The curriculum “comes as a shock” for many 9th grade students who did not experience it in middle school. The intensity of effort required from students to successfully navigate the curriculum also requires greater supports/supplements to the curriculum and greater effort from teachers. Even for students who are not strong math students, the MVP Math Curriculum creates an environment where mistakes are an accepted, even necessary, part of the learning process. The fact that there is often more than one answer or one approach to a problem is a very positive experience for these students.
<p>Gaps in the MVP Math Curriculum</p>	<p>Administrators’ responses to this question were mixed. Most acknowledged that there are gaps, and that teachers have worked hard to close them through the use of supplementary materials. Others statements included:</p> <ul style="list-style-type: none"> The gaps are not in the curriculum, but rather in many students’ lack of prior knowledge. This was a greater issue in the first year of implementation, but in subsequent years, the district has helped to provide resources to close the gaps.
<p>Structures Established to Support Teacher Implementation of the MVP Math Curriculum</p>	<p>All schools have provided structures and procedures to facilitate effective implementation of the MVP Math Curriculum. Common strategies include:</p> <ul style="list-style-type: none"> Collaborative teacher planning time embedded in the master schedule District training that is differentiated by teacher experience levels One day per quarter devoted to district MVP Math Curriculum training A visiting math specialist provided by the district Structuring of the master schedule to limit the number of different lesson preparations by individual teachers
<p>Teacher Strategies that Support Student</p>	<p>Students were asked to identify those teaching practices that they found most beneficial in helping them learn, and cited the following examples:</p>

<p>Learning</p>	<ul style="list-style-type: none"> • Teachers taking the time to work through problems multiple times and providing extended guided and independent practice • Having the opportunity to ask questions of both their peers and their teacher and having time to think through their response to math problems • Taking notes on teacher lecture and having access to the notes to prepare for end-of-unit, and end-of-course exams <p>Teachers cited having the opportunity to have common planning time to discuss the curriculum, share lesson plans and instructional strategies, and review student work as a strong source of support for student learning.</p>
<p>Features to Add to the MVP Curriculum</p>	<p>Teachers and students shared many of the same thoughts and ideas around enhancements to the MVP curriculum. Common responses included providing the following:</p> <ul style="list-style-type: none"> • More sample problems for practice • More pages in the student workbook for taking notes • Interactive note pages to guide student note-taking practices during class • A glossary of mathematical terms that can be referenced to supplement the terms students take notes on in class and to assist students who need more support in mastering their understanding of the terms • A larger bank of sample test questions for formative assessments to ensure adequate practice is provided through MVP Math lessons to adequately prepare students for year-end assessments
<p>Would You Select MVP Math Curriculum Again?</p>	<p>Generally, school principals responded positively to this question. Specifically:</p> <ul style="list-style-type: none"> • The most frequent reason given for a positive response was an appreciation for the additional level of challenge provided by the curriculum and the mathematical discourse students routinely engage in during Math classes using MVP. • If principals had a qualifier on their response, it was to recommend that the curriculum be continued, but modified to provide more supporting materials for students who struggle with basic mathematical understanding.

Online Parent Survey and Parent Focus Groups

MGT created a survey that sought to determine parental perceptions of the MVP math curriculum. The school district emailed a link to the 9-item survey to parents of all current MVP Math students in middle and schools. The survey was opened on October 29, 2019 and closed on November 13, 2019. Each of the items were multiple choice, and following the response options, survey participants could also provide unlimited narrative responses to provide more detail about their survey response.

Parents received a link to the online survey if they had a child who:

- Is currently enrolled in Math 1 during the first semester of the 2019-20 school year.
- Is currently enrolled in Math 2 or Math 3 for the first or second semester of the 2019-20 school year.

Using these criteria the WCPSS Technology Services department deployed 32,085 emails, pulled from information in PowerSchool.

In addition to the online survey, MGT facilitated four parent focus group meetings around the district. The focus groups were conducted on October 29th and 30th, and November 4th and 5th. Potential participants in the focus groups included the parents of students in Math 1, 2 and 3 at the 23 selected middle and high schools in the study. One hundred and seventy-five invitational calls were made, and 31 parents responded affirmatively. Of that number, 10 parents participated over the course of the four focus groups.

The following statements provide a summary of the majority responses to each of the nine items of the online survey:

- Parents did not receive information about the MVP Math Curriculum at the time that it was first introduced in the district.
- The MVP Math Curriculum is not an improvement over its predecessor.
- The level of rigor/challenge in the MVP Math Curriculum is too high.
- Parents have never visited the WCPSS Math Resources website.
- The MVP Math Curriculum has been very frustrating to students.
- Children's performance on math assessments has declined.
- Parents have not received communications from their children's teacher about the MVP Math Curriculum.
- Since the implementation of the MVP Math Curriculum, parents have had to spend more time helping their children at home.
- Students have had to spend more time working on math assignments/homework since the implementation of the MVP Math Curriculum.

Responses from the parents who attended the focus group mirrored the online survey in terms of communication about the MVP Math Curriculum. Parents reported that they had received little in the way of information prior to the implementation of the curriculum, and one parent said the first she'd heard about the curriculum was when she was invited to participate in the focus group interview. Two parents described their children as having great frustration with the curriculum, and needing to provide them with additional support and hiring tutors. All parents stated that they were challenged in their efforts to help their children with their assignments. Two parents said their children were being challenged, but felt that it was a positive learning experience overall.