



October 2017

Instructional Coaching Profile of Practice Brief

Kerstin Carlson Le Floch, Ph.D.

Courtney Tanenbaum, Ed.D.

Kirk Walters, Ph.D.





Contents

1	Introduction	1
2	Lessons From the Field	4
3	Haverton County at a Glance	6
4	Colina County at a Glance	8
5	Why Districts Turned to Mathematics Coaches	10
6	Coaching Activities in Haverton and Colina	13
7	Implementation of Algebra I Coaching	17
8	Challenges and Facilitating Factors	22
9	Key Considerations for Education Decision Makers	25
10	Appendix	28
11	References	31



1 Introduction

2

3

4

5

6

7

8

9

10

11

Introduction 1

Lessons From the Field 2

Haverton County at a Glance 3

Colina County at a Glance 4

Why Districts Turned to Mathematics Coaches 5

Coaching Activities in Haverton and Colina 6

Implementation of Algebra I Coaching 7

Challenges and Facilitating Factors 8

Key Considerations for Education Decision Makers 9

Appendix 10

References 11



Introduction

High school graduation rates in the United States are at their highest in U.S. history—81 percent. Even so, nearly one in five students nationally does not graduate from high school and dropout rates are particularly high for students from low-income families, racial and ethnic minority students, and students with disabilities (National Center for Education Statistics, 2015). Though students drop out of high school for a variety of reasons, research consistently reveals that students who fail Algebra I are at an especially high risk (e.g., Oriheula, 2006; Silver, Saunders, & Zarate, 2008). Algebra I, or its equivalent, is typically required for graduation from high school and is a critical gateway course to more advanced mathematics and science courses as well as potential postsecondary degree pursuits (e.g., Ham & Walker, 1999; Helfand, 2006).

Requiring Algebra I of all students does not on its own guarantee that students will succeed in gaining the content knowledge and skills they will need to advance in their education pathways. For example, students who are underprepared for Algebra I may struggle in the course and these challenges could set them on a path toward gradual educational disengagement—not just with mathematics, but with school (Stoelinga, & Lynn, 2013). However, districts and schools can engage in at least five research-based strategies that may promote student success in Algebra I: instructional practices, professional development, instructional coaching, curriculum alignment, and supplementary learning supports for struggling students.¹

To share information about these strategies, the U.S. Department of Education’s High School Graduation Initiative (HSGI) funded the Promoting Student Success in Algebra I (PSSA) project at American Institutes for Research (AIR).² PSSA is designed to provide actionable information for educational program developers in three ways. First, a series of research briefs summarizes research on the five strategies above that HSGI grantees are implementing to help struggling students succeed in Algebra I. Second, the project includes a forum for practitioners—district program developers or administrators and teachers—to make connections between the findings from the research briefs and their daily work. The results of these discussions have been published in a series of perspective briefs. Third, the project includes profiles of practice that provide an in-depth look at implementation of these five strategies.

¹ For research summaries on each of these strategies, see Sorensen, 2014; Smith, 2014a, 2014b; Walters, 2014a, 2014b.

² This brief contains examples of, adaptations of, and links to resources created and maintained by other public and private organizations. This information, gathered in part from practitioners, is provided for the reader’s convenience and is included here to offer examples of the many resources and models that educators, parents, advocates, administrators, and other concerned parties may find helpful and use at their discretion. These materials may contain the views and recommendations of various subject matter experts as well as hypertext links, contact addresses, and websites to information created and maintained by other public and private organizations. The opinions expressed in any of these materials do not necessarily reflect the positions or policies of the U.S. Department of Education (Department). The Department does not control or guarantee the accuracy, relevance, timeliness, or completeness of this outside information. Further, the inclusion of links to resources and examples do not reflect their importance, nor is it intended to represent or be an endorsement by the Department of any views expressed, or materials provided.

Introduction 1

Lessons From the Field 2

Haverton County at a Glance 3

Colina County at a Glance 4

Why Districts Turned to Mathematics Coaches 5

Coaching Activities in Haverton and Colina 6

Implementation of Algebra I Coaching 7

Challenges and Facilitating Factors 8

Key Considerations for Education Decision Makers 9

Appendix 10

References 11



One of these five research-based strategies is instructional coaching designed to improve the quality of teaching and learning in Algebra I. The PSSA research brief on instructional coaching (Walters, 2014a; see www2.ed.gov/programs/dropout/instructionalcoaching092414.pdf) found that strong coaching programs had the following features:

- Focus on providing teachers with structured feedback on a narrow set of instructional practices;
- Emphasize strategies to improve student engagement and student reasoning;
- Use expert, well-trained coaches; and
- Take more than one year to show gains in student achievement outcomes.

To provide real-world examples of these practices supporting students' preparation for and success in Algebra I, this brief profiles the experiences of two very different school districts: rural Haverton County and urban Colina County.³ Despite their many differences, both districts adopted an instructional coaching approach to improve student learning in Algebra I. The goal of this profile is not to suggest that other districts should mimic these approaches, but rather to share experiences and ideas that other districts may adapt to meet their own communities' needs.

The information presented here emerged from visits to the two districts, during which AIR staff conducted interviews and focus groups with district mathematics leaders, mathematics coaches, school principals, mathematics department chairs and teacher leaders, and mathematics teachers. AIR also reviewed coaching materials and tools, such as rubrics, forms used to provide feedback to teachers, forms used to monitor teacher practice, and other curricular and online supports.

³ See the Appendix for sampling, data collection, and analytic methods, including district selection criteria. All names of people and places in this practice profile are pseudonyms.

Introduction **1**

Lessons From the Field **2**

Haverton County at a Glance **3**

Colina County at a Glance **4**

Why Districts Turned to Mathematics Coaches **5**

Coaching Activities in Haverton and Colina **6**

Implementation of Algebra I Coaching **7**

Challenges and Facilitating Factors **8**

Key Considerations for Education Decision Makers **9**

Appendix **10**

References **11**



- 1
- 2**
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11

Lessons From the Field

- Introduction 1
- Lessons From the Field 2**
- Haverton County at a Glance 3
- Colina County at a Glance 4
- Why Districts Turned to Mathematics Coaches 5
- Coaching Activities in Haverton and Colina 6
- Implementation of Algebra I Coaching 7
- Challenges and Facilitating Factors 8
- Key Considerations for Education Decision Makers 9
- Appendix 10
- References 11



Lessons From the Field

The following lessons reflect the experiences of the districts profiled here:

- **A highly qualified, visionary coach can drive instructional change.** In Haverton County, one individual—the math coach—saw the need for instructional support in math and spearheaded the coaching initiative. Although Haverton County is rural and isolated, Haverton High School’s math classrooms reflect the best, research-based practices in Algebra I. This individual also was highly skilled and knowledgeable, which reflects the research on the importance of providing well-trained, expert coaches.
- **A robust system of district support strengthens school-level coaching.** In Colina County, district officials provide frequent, in-school support to the math coaches and are able to respond to districtwide Algebra I needs. Complex, multiyear initiatives in larger systems not only require multiyear coaching programs; district- and school-level instructional leadership must be tightly linked and opportunities must be available to develop and strengthen these links.
- **A strong rapport with teachers is essential to effective coaching, but it can take time to develop.** In both districts, coaches eased into their roles by acknowledging their outsider status and starting with less challenging topics. Now, teachers in both districts say they are very comfortable with the coach in their classrooms, but as one teacher said, “I would have been so intimidated” at the start if the approach had been different. Although not highlighted specifically in the research, rapport-building is perhaps a common precondition of effective coaching.
- **More than one year is needed to help teachers implement complex forms of instruction.** Both coaching programs were tied to helping teachers implement content standards and curriculum that were conceptually demanding. In both cases, the coaching program did not assume that teachers would become experts overnight. The program instead reflected the research by assuming a gradual, multiyear trajectory of teacher growth.

Introduction	1
Lessons From the Field	2
Haverton County at a Glance	3
Colina County at a Glance	4
Why Districts Turned to Mathematics Coaches	5
Coaching Activities in Haverton and Colina	6
Implementation of Algebra I Coaching	7
Challenges and Facilitating Factors	8
Key Considerations for Education Decision Makers	9
Appendix	10
References	11



- 1
- 2
- 3**
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11

Haverton County at a Glance

Introduction	1
Lessons From the Field	2
Haverton County at a Glance	3
Colina County at a Glance	4
Why Districts Turned to Mathematics Coaches	5
Coaching Activities in Haverton and Colina	6
Implementation of Algebra I Coaching	7
Challenges and Facilitating Factors	8
Key Considerations for Education Decision Makers	9
Appendix	10
References	11

Haverton County at a Glance

Haverton County is a rural, mountainous, picturesque region located hours from any metropolitan area. The majority of the student population is White, and although most families live below the federal poverty line, few families lack food; indeed, many families reportedly grow vegetables, and the start of hunting season means an opportunity to stock freezers with venison. In this setting, college attendance is not yet part of the culture, and even students who are successful in Advanced Placement courses may not go on to higher education. Although the district's approximately 1,000 students are spread throughout a large geographic area—many students travel more than one hour to get to school—the community is close-knit, and the rate of mobility in and out of the district is low. Indeed, the high school math teachers, although relatively young, anticipate spending their entire careers in Haverton County.

Table 1. Haverton County at a Glance

Geographic Region	Mid-Atlantic
Setting	Rural
District Enrollment	Approximately 1,000
Total Number of Schools	5
Number of High Schools	1
High School Enrollment	Approximately 300
Algebra I Curriculum	Open-source, ⁴ integrated Algebra I program
Percentage Proficient in Algebra I	55 percent
High School Attendance	97 percent
High School Graduation Rate	80 percent
High School Math Teachers	4
High School Students Eligible for Free or Reduced-Price Lunch	Approximately 70 percent

Data reported are estimates based on publicly available data for the 2014–15 school year and have been modified minimally to protect the identity of the site.

schools that are spread widely apart. Since the coaching initiative began four years ago, teachers have reported high levels of satisfaction and the county has shown gains in algebra achievement. Specifically, Haverton High School improved Algebra I proficiency rates by 14 percentage points during a three-year period and continues to outpace the rate of improvement in the rest of the State.

Yet, it is in this isolated setting that a dynamic and passionate mathematics coach has transformed instruction. Four years ago, Ms. Woods, who had previously taught math in the county, wanted to ensure that teachers in her district were well prepared to implement challenging state academic content standards. She convinced administrators and educators to pilot a math coaching model. As a native of Haverton County, with teaching experience in diverse settings across the county, Ms. Woods brought to this pilot her unique mix of deep math content and instructional expertise and indispensable familiarity with the teachers and families in Haverton County.

During the past four years, Ms. Woods has developed a highly collaborative approach to researching, developing, and refining lessons. The coaching activities occur one-on-one and in small-group meetings, both in-person and through e-mail and, occasionally, by remote video. Although reliable Internet access is not always a given in rural communities, video-based coaching is becoming a necessity for this small, rural district with

⁴ An open-source curriculum is a Web-based instructional resource that can be freely used, distributed, and modified.

- Introduction 1
- Lessons From the Field 2
- Haverton County at a Glance 3**
- Colina County at a Glance 4
- Why Districts Turned to Mathematics Coaches 5
- Coaching Activities in Haverton and Colina 6
- Implementation of Algebra I Coaching 7
- Challenges and Facilitating Factors 8
- Key Considerations for Education Decision Makers 9
- Appendix 10
- References 11



1

2

3

4

Colina County at a Glance

5

6

7

8

9

10

11

Introduction 1

Lessons From
the Field 2

Haverton County
at a Glance 3

**Colina County
at a Glance 4**

Why Districts Turned
to Mathematics
Coaches 5

Coaching Activities in
Haverton and Colina 6

Implementation of
Algebra I Coaching 7

Challenges and
Facilitating Factors 8

Key Considerations
for Education
Decision Makers 9

Appendix 10

References 11

Colina County at a Glance

In many ways, the Colina County Public Schools could not be more different from the schools in Haverton County. With enrollment approximately 180,000 students, Colina County is large, diverse, and multilingual. Although more than half of Colina County’s students qualify for free or reduced-price lunch, enrollment covers the socioeconomic spectrum. The Colina County district office is robust and forward thinking, seeking new instructional approaches and funding streams that can advance innovation in their classrooms. Teachers are supported by a well-established infrastructure of professional learning opportunities and the district regularly seeks input from teachers regarding how the district can better meet its needs.

Table 2. Colina County at a Glance

Geographic Region	South
Setting	Urban
District Enrollment	Approximately 180,000
Total Number of Schools	250
Number of High Schools	30
Franklin High School Enrollment	Approximately 1,500
Algebra I Curriculum	Blended learning ⁵ commercial Algebra I program
Franklin High School, Percentage Proficient in Mathematics	52 percent
Franklin High School Graduation Rate	84 percent
Franklin High School Mathematics Teachers	12
High School Students Eligible for Free or Reduced-Price Lunch	Approximately 70 percent

Data reported are estimates based on publicly available data for the 2014–15 school year and have been modified minimally to protect the identity of the site.

them with feedback that enables them to grow as instructional leaders. This district official visits Franklin High School—and other schools in the district—almost once a week. In addition to the instructional coaching, the district provides professional learning opportunities and trainings to help ensure that Algebra I teachers have the instructional resources they need.

Franklin High School—featured in this profile—is one of the oldest high schools in Colina County and has gone through several transitions as the neighborhood has shifted. As enrollment declined, Franklin established four magnet programs to attract students, and nearly half of the school is now composed of magnet students. (The magnet “academies” are considered to be honors programs and students must apply to attend.) The majority of students are African-American or Hispanic and are from low-income households, with 70 percent of students eligible for free or reduced-price lunch. Enrollment is just around 1,500, which makes Franklin one of the smaller high schools in Colina County.

As the district transitioned to a new Algebra I curriculum two years ago, the principal of Franklin High School saw the need for a full-time math coach and hired Ms. Baker to fill this position. In this role, Ms. Baker interacts with all of the math teachers nearly every day. In turn, she receives support from a district official whose primary responsibility is to assist math coaches, providing

- Introduction 1
- Lessons From the Field 2
- Haverton County at a Glance 3
- Colina County at a Glance 4**
- Why Districts Turned to Mathematics Coaches 5
- Coaching Activities in Haverton and Colina 6
- Implementation of Algebra I Coaching 7
- Challenges and Facilitating Factors 8
- Key Considerations for Education Decision Makers 9
- Appendix 10
- References 11

⁵ Blended learning is an instructional approach in which students access at least some of the content through an online, computer-based platform.



1

2

3

4

5

6

7

8

9

10

11

Why Districts Turned to Mathematics Coaches

Introduction 1

Lessons From the Field 2

Haverton County at a Glance 3

Colina County at a Glance 4

Why Districts Turned to Mathematics Coaches 5

Coaching Activities in Haverton and Colina 6

Implementation of Algebra I Coaching 7

Challenges and Facilitating Factors 8

Key Considerations for Education Decision Makers 9

Appendix 10

References 11



Why Districts Turned to Mathematics Coaches

Both the Haverton and Colina districts proactively developed their coaching programs to support the implementation of new, more rigorous standards. A recognized need for a dramatic shift in teacher instructional practice—combined with the adoption of new algebra curriculum and materials—were major factors driving both of these districts’ decisions to develop a mathematics instructional coaching program. In Haverton County, the State’s adoption of the academic content standards and subsequent rollout of assessments aligned to these standards provided the primary impetus and a unique opportunity to gain buy-in among key stakeholder groups. As Ms. Woods, the Haverton coach, remarked:

[Adopting these challenging new content standards] was a huge player in helping build this. Now is the time for any teacher to say ‘I don’t have any idea what this standard means and I shouldn’t be expected to because it wasn’t in my training.’...There is a common understanding and perception that the mathematics education programs didn’t do a good job of preparing teachers for [these challenging content standards] and that is used as the reason for why teachers need help and more support.

From the start, the math coach was the visionary and primary driver for creating the coach position in Haverton County. Although district staff were concerned about students’ achievement in Algebra I and subsequent mathematics and science courses, it was the coach (who was then serving as a middle school teacher) who identified the need for a coaching program in anticipation of more challenging academic content standards. With this foresight, Ms. Woods approached the district’s school board, advocating that it start planning for full implementation of the challenging academic content standards and the aligned assessments. She suggested an instructional coaching program that would first focus on working directly with algebra teachers to develop an Algebra I curriculum that better aligned with the new content standards as well as the types of instruction and skills these standards promote. Next, she proposed moving to a second phase of coaching that would emphasize pedagogical strategies that engage students in the learning process and lead to their success in Algebra I. With the support of the assistant superintendent and school board, Ms. Woods was able to take her proposal to the teachers for their feedback and approval. The teachers agreed and the initiative moved forward.

Introduction	1
Lessons From the Field	2
Haverton County at a Glance	3
Colina County at a Glance	4
Why Districts Turned to Mathematics Coaches	5
Coaching Activities in Haverton and Colina	6
Implementation of Algebra I Coaching	7
Challenges and Facilitating Factors	8
Key Considerations for Education Decision Makers	9
Appendix	10
References	11



At Franklin High School, in Colina County, the principal was the main driver behind the full-time math coaching position, but the district has supported, sustained, and underscored the need for this role. The principal of Franklin High School reported that he came from a previous school with instructional coaches, so he supported this model, and chose to spend his Title I dollars on a math coach. District officials reported that this was entirely his decision, but they provide an infrastructure that enables the coach to be successful in her role. (For example, two full-time district staff provide support to the coaches.) Having a full-time math coach at Franklin High School coincided with the implementation of newly adopted algebra curricula. The districtwide adoption of their blended Algebra I program not only required teachers to use new instructional materials, but also required a substantial instructional shift in the way teachers had been providing instruction. Unlike more procedural, skill-based curricula, this program places a strong emphasis on developing students' conceptual understanding and mathematical reasoning through problem-solving situations. As of the 2014–15 school year, the district had six high schools with full-time mathematics coaching positions. As was the case with Haverton County, there was a strong academic rationale for creating coaching positions at the school-level, and the district supported the strategy. The combination of these factors provided the impetus and context that facilitated the development of a mathematics coaching program.

Introduction	1
Lessons From the Field	2
Haverton County at a Glance	3
Colina County at a Glance	4
Why Districts Turned to Mathematics Coaches	5
Coaching Activities in Haverton and Colina	6
Implementation of Algebra I Coaching	7
Challenges and Facilitating Factors	8
Key Considerations for Education Decision Makers	9
Appendix	10
References	11



1

2

3

4

5

6

7

8

9

10

11

Coaching Activities in Haverton and Colina

Introduction 1

Lessons From
the Field 2

Haverton County
at a Glance 3

Colina County
at a Glance 4

Why Districts Turned
to Mathematics
Coaches 5

**Coaching Activities
in Haverton and
Colina 6**

Implementation of
Algebra I Coaching 7

Challenges and
Facilitating Factors 8

Key Considerations
for Education
Decision Makers 9

Appendix 10

References 11

Coaching Activities in Haverton and Colina

Although the mathematics coaching position in Haverton County is only part-time, the coach has progressively increased the number of teachers she supports. During her one week per month in the district, Ms. Woods visits all of the elementary schools, the middle school, and the high school (approximately 50 teachers total). During these visits, she holds at least one afterschool professional learning community (PLC)-type meeting with the high school and middle school teachers and at each of the other school sites. These meetings vary in focus, but typically involve discussing a new lesson plan they are developing, have tried, or want to try; successes and challenges that teachers are experiencing in their classrooms; and new resources or strategies teachers or the coach have identified. In addition to the PLC meetings with teachers, the coach will model lessons and then observe the teachers and provide feedback at each of the five school sites.

Table 3. Algebra I Coaching at a Glance

Haverton County	Colina County
Part-time coach	Full-time coach
Sees math teachers one week each month	Sees math teachers daily
Provides support through PLCs, modeling instruction, e-mail, and videoconferencing	Provides support through PLCs, modeling instruction, classroom assistance as needed
Engages teachers in thinking about mathematics content, developing lessons, discussing classroom challenges	Engages teachers in thinking about instructional strategies, new curricula, syllabi, and scheduling
Sees her role as building content knowledge, excitement about mathematics, and student-centered instruction	Sees her role as building teacher capacity, facilitating teachers' instructional responsibilities, and transitioning to new curricula

During the time between on-site visits, Ms. Woods stays in regular touch with the teachers through e-mail and phone and conducts remote video meetings with teachers on a biweekly basis. The e-mail and phone communications are relatively informal, with the coach checking in at times and the teachers e-mailing her with questions, successes, and challenges and to share resources or materials. The blend of in-person and remote meetings enables her to maintain her relationship with teachers and familiarity with students' needs despite the large geographic area the district covers.

Indeed, during the past four years, the coaching activities in Haverton County have evolved. In the first year, Ms. Woods transitioned into the role by primarily focusing on building a trusting coach–teacher relationship and “doing mathematics” with the teachers to help develop their content knowledge. In the second year, beginning in the summer, Ms. Woods focused on working collaboratively with teachers to develop the Algebra I curriculum that mapped to new academic content

- Introduction 1
- Lessons From the Field 2
- Haverton County at a Glance 3
- Colina County at a Glance 4
- Why Districts Turned to Mathematics Coaches 5
- Coaching Activities in Haverton and Colina 6**
- Implementation of Algebra I Coaching 7
- Challenges and Facilitating Factors 8
- Key Considerations for Education Decision Makers 9
- Appendix 10
- References 11



standards. In the third and fourth years, Ms. Woods has focused on refining and adjusting the curriculum to add new lessons, tweak lessons, and solidify instructional techniques. The coach and the teachers emphasized that the more frequent in-person time with the coach was a benefit in the early years of the program, but the coach being remote in the third and fourth years has not proven problematic due to the strong foundation and her familiarity with the teachers, their needs, and their students. The teachers noted that they still rely on her support, but remote coaching meets their primary needs. Unique contextual factors, including the stability of the teaching staff (little to no turnover), the relatively small size of the district, and Ms. Woods' deep knowledge of the community, also likely contributed to the success of the remote coaching model.

Figure 1. Sample PLC Agenda for Algebra I Teachers

Time: 3:30–5:30

1. High/lowlights from last meeting (10 min)
2. Teacher presentation #1 with feedback: multiple-representation model for systems of equations (30 min)
3. Teacher presentation #2 with feedback: introducing rich tasks (30 min)
4. Group reflection on implementation of recent mathematical communication tool (30 min)
5. Group reflection on department's goal of improving students' mathematical discourse (10 min)
6. Next steps (10 min)

In contrast, Franklin High School in Colina County has the resources to fund a full-time mathematics coach. As a result, Ms. Baker explained that she was able to talk to each one of the 12 math teachers at some point every day. Of course, not all teachers need the same level of support, so the Algebra I teachers—who are in their second year of implementing their blended, problem-solving based program—receive the most support. The coach convenes a weekly PLC with the Algebra I teachers, during which they review upcoming lesson plans, pacing, and logistics. Indeed, the transition to this program, during the 2013–14 school year, was reportedly difficult for teachers, and they relied heavily on the coach. One teacher described the transition by saying, “Teaching it old school was like, OK, turn to page 272, we’re going to do slope intercepts... now it’s like, conceptual, it’s a bit more real-life to [the students]. They argue about who’s gonna get it correct.” Another teacher

described the implementation of these new programs as overwhelming, frustrating, and scary. Ms. Baker, however, was a reassuring presence who worked with teachers individually to give them strategies and support them through the more difficult transitions.

The coach also provides day-to-day support with tasks such as ensuring teachers have appropriate materials, photocopies, and other activities that can take their time away from teaching. According to teachers, however, Ms. Baker's most valued activity is modeling instruction or co-teaching, which teachers report happens “all the time.”

Coaching Activities in Haverton and Colina

Introduction	1
Lessons From the Field	2
Haverton County at a Glance	3
Colina County at a Glance	4
Why Districts Turned to Mathematics Coaches	5
Coaching Activities in Haverton and Colina	6
Implementation of Algebra I Coaching	7
Challenges and Facilitating Factors	8
Key Considerations for Education Decision Makers	9
Appendix	10
References	11



Teachers are comfortable with the coach popping into their class unannounced to observe, and, as necessary, step into the instructional role. As one teacher explained:

She makes us be more effective and better prepared for what we have to face in the classroom. Plus, sometimes she takes the stress off of us by stepping into the classroom and giving us that three-minute break that we might need to step outside and reassess what's going on because I can tell you, there have been days...and she is there to back us up and help us refocus and realize—OK, we can do this. I mean, I couldn't—I wouldn't—do this job without her.

Another teacher explained:

[The coach] is really hands-on. She was in the classroom with us. She was helping us to implement strategies to help our struggling students. She really focused on building us up to where we could be successful as well as see the students be successful...We know the way she works, she knows the way we work, and we kind of just flow now and it seems to be just like a really good oiled unit.

Teachers reported that they appreciate the support, knowing that they can rely on Ms. Baker as a resource. One teacher summarized: "It's like we have Superman in our back pocket."

**Coaching Activities
in Haverton and
Colina**

Introduction 1

Lessons From
the Field 2

Haverton County
at a Glance 3

Colina County
at a Glance 4

Why Districts Turned
to Mathematics
Coaches 5

**Coaching Activities
in Haverton and
Colina 6**

Implementation of
Algebra I Coaching 7

Challenges and
Facilitating Factors 8

Key Considerations
for Education
Decision Makers 9

Appendix 10

References 11



1

2

3

4

5

6

7

8

9

10

11

Implementation of Algebra I Coaching

Introduction 1

Lessons From the Field 2

Haverton County at a Glance 3

Colina County at a Glance 4

Why Districts Turned to Mathematics Coaches 5

Coaching Activities in Haverton and Colina 6

Implementation of Algebra I Coaching 7

Challenges and Facilitating Factors 8

Key Considerations for Education Decision Makers 9

Appendix 10

References 11



Implementation of Algebra I Coaching

In Haverton County, the district and coach’s approach to rolling out the coaching model and engaging teachers was deliberate and purposeful. A key element was the coach’s existing position and reputation in the district. Ms. Woods was a highly regarded teacher; her students’ test scores were among the highest, and teachers and school leaders had seen her teach and viewed her as effective in the classroom. The existing respect for her practice provided her with credibility in the district and among her colleagues, as did her position as a long-standing and trusted member of the community: She grew up in the district and attended school there herself.

Despite the initial familiarity, level of trust, and respect for the coach, Ms. Woods knew she needed to transition slowly into the coach role and the new relationship she was forging with the teachers. She began by meeting individually with each of the teachers she would be supporting. She asked each teacher to bring a “math idea” to this meeting that they could share with her; specifically, an idea that was “rooted in a common student misconception that they had observed in class.” As she stated:

I focused on finding the thing that could be the most positive and build on that rather than find and focus on the biggest weakness in the teachers...You have to start with what is hard for kids, not what aren’t the teachers doing. By focusing on students’ reactions and what they are challenged with, you can find something to work on together (the coach and the teachers) in a nonthreatening way—not focusing on what is wrong with the teacher.

Another early tactic was to not observe teachers, only model instruction. Ms. Woods worked closely with the teachers to develop and model lessons. She also collaborated one-on-one with teachers to work through mathematics content, mathematics ideas, and areas in which students struggled. Her focus remained on promoting herself as a resource, a partner, and collaborator, not an evaluator or fixer of their teaching. In describing her approach, the coach explained:

For example, I would do a demo lesson in [a teacher’s] classroom that she would observe and take notes on. In the postdemo conference, I would ask her, what do you notice from my demo? What do you think was having the greatest impact on the kids? What feels possible to you? What do you want to take on as a goal? What I’m learning is that what I think a teacher needs and what a teacher is ready to do and can get excited about is the best approach. It’s important to know what they can take on and what they are motivated to take on.

Introduction	1
Lessons From the Field	2
Haverton County at a Glance	3
Colina County at a Glance	4
Why Districts Turned to Mathematics Coaches	5
Coaching Activities in Haverton and Colina	6
Implementation of Algebra I Coaching	7
Challenges and Facilitating Factors	8
Key Considerations for Education Decision Makers	9
Appendix	10
References	11

The coach explained, “By focusing on students’ reactions and what they’re challenged with, you can find something to work on together...not focusing on what’s wrong with the teacher.”

In the fourth year of the program, Ms. Woods now regularly observes teachers. Student engagement and learning, however, remain the focus and starting point for discussions. The coach and teachers also are starting to watch videos of their and of each other’s teaching. They come together as a group to debrief on the instruction they observed and to identify which aspects of the instructional delivery or lesson worked well in terms of engaging and promoting student learning and where tweaks could be made. Ms. Woods has developed a number of tools to help teachers observe each other and stimulate discussion after observations. One observation agenda, for example, asks teachers to reflect on “What was the heart of the new math in this lesson?” and “Where and when during this lesson did students advance their understanding of this mathematics? How do you know?” (See Figure 2 for an excerpt of the observation agenda.)

In reflecting on the coach’s approach to working with teachers, especially initially, one of the middle school teachers praised the coach’s focus on building a trusting and collaborative relationship with teachers, saying, “This was a good strategy. I think this was intentional. I would have been so intimidated and now I don’t mind at all. I’m observed all the time.”

Similarly, in Colina County, the new math coach at Franklin High School sought to gradually build familiarity with the staff. As in Haverton County, the math coach in Colina County was a well-regarded math teacher before she took on the coaching role. She also had prior math coaching experience, but at the middle school level, so the transition to the high school was not without challenges. Indeed, Ms. Baker overheard commentary suggesting she did not have the skills required to navigate a high school. She also observed that students who take Algebra I in high school have a different set of needs than students who take Algebra I in middle school, so she had to think about how to structure instructional activities differently—and to accommodate the needs of a larger population of English language learners. As Ms. Baker remarked:

The biggest thing coming into a new faculty is you’re an outsider... these teachers have been here for years and years. They love it

Figure 2. Observation Agenda Sample Questions

What to look for?

- Start class: How are students welcomed? What do students do first?
- Checks for understanding or formative assessment
- Someone is not paying attention; redirecting off-task behavior
- Small-group practice or work

What to discuss after the observation?

- What was the heart of the new math in this lesson?
- Was the new mathematics being introduced, reinforced, or refined? How do you know?
- Where and when during this lesson did students advance their understanding of this math? How do you know?

Introduction	1
Lessons From the Field	2
Haverton County at a Glance	3
Colina County at a Glance	4
Why Districts Turned to Mathematics Coaches	5
Coaching Activities in Haverton and Colina	6
Implementation of Algebra I Coaching	7
Challenges and Facilitating Factors	8
Key Considerations for Education Decision Makers	9
Appendix	10
References	11



here, they're very loyal to the school, so I was kind of an outsider coming in...you have to develop rapport, instead of [being] another person who is [saying] you've got to do something or you're doing it wrong.

The district provided support, helping Ms. Baker to fine-tune her perceptions of what each teacher needed. As one official noted, “[The coach] has grown quite a bit in learning that mentoring language and coaching language and having the teacher identify needs and areas to develop and focus steps.” Although it took time, all respondents reported that the math coach at Franklin High School has progressively won the trust and respect of the math teachers. As the coach noted, “I was told by some teachers, ‘We weren’t sure when you first came in, but we’re okay now.’”

Instructional coaching in Colina County is embedded within an extensive, intricate system of support. The rollout of the instructional coaching activities at Franklin High School was closely connected to larger initiatives within the district, primarily the launch of the blended Algebra I program districtwide (Deiger et al., 2009). District officials knew that the transition to more rigorous content would be difficult, and it would be easier to build teacher buy-in if they had school-based support. In addition, math teachers had provided feedback to the district office that they wanted more opportunities to collaborate and plan together. Thus, the coaches were hired as part of the efforts of the district to respond to teachers’ needs, support transition to a challenging new instructional approach, and facilitate the implementation of research-based strategies.

Two district officials have taken on primary responsibility for supporting the six full-time math coaches (as well as part-time coaches) and Algebra I instruction throughout the district. One of these officials, the district academic coach for secondary math, spends nearly all of her time in schools and reports that she “talks to [Ms. Baker] every day.” Her focus is exclusively on implementing instructional practices at the classroom level and developing strategies for observation, reflection, and mastery of new instructional techniques. This district official observes classrooms to see how students are engaging with content, how the teacher is guiding student discussions, and how the coach is supporting teachers through the coaching cycle.

Figure 3. Recommendations From Colina and Haverton:

- ✓ Secure a coach with a solid rapport and reputation.
- ✓ Focus on addressing students’ academic struggles, not teachers’ instructional faults.
- ✓ Start with modeling and relationship building, not observing and evaluating.
- ✓ Use trust and collaboration as a foundation for reflection and growth with teachers.
- ✓ Provide tiered instructional support with more intensive resources directed toward schools that need them the most.

Introduction	1
Lessons From the Field	2
Haverton County at a Glance	3
Colina County at a Glance	4
Why Districts Turned to Mathematics Coaches	5
Coaching Activities in Haverton and Colina	6
Implementation of Algebra I Coaching	7
Challenges and Facilitating Factors	8
Key Considerations for Education Decision Makers	9
Appendix	10
References	11



A second official, the district resource teacher for secondary math, focuses on implementing the new Algebra I curriculum and providing the necessary supports. As she explains it, her vantage point within the district enables her to gauge implementation “at a much bigger angle. [I’ve] seen other districts implement it and our district implement it and I see common trends where our algebra students are struggling across the board.” She elaborated, “My job is really to make sure that [the coach] understands the practices and the research behind why we implemented the programs for Algebra I and what the research says about our [lower-achieving] students and how those programs support that research.”

The central office has an explicit focus on building capacity at the school level—and most importantly, at the classroom level—so the research-supported practices become self-sustaining. As a Colina official explained, “It is the mind-set of a coach; a coach should be building capacity to work themselves out of a job. So a coach should build supports that are self-sustaining so if that position no longer existed that that school could function at that same level without that coach.”

Introduction	1
Lessons From the Field	2
Haverton County at a Glance	3
Colina County at a Glance	4
Why Districts Turned to Mathematics Coaches	5
Coaching Activities in Haverton and Colina	6
Implementation of Algebra I Coaching	7
Challenges and Facilitating Factors	8
Key Considerations for Education Decision Makers	9
Appendix	10
References	11



1

2

3

4

5

6

7

8

9

10

11

Challenges and Facilitating Factors

Introduction 1

Lessons From the Field 2

Haverton County at a Glance 3

Colina County at a Glance 4

Why Districts Turned to Mathematics Coaches 5

Coaching Activities in Haverton and Colina 6

Implementation of Algebra I Coaching 7

Challenges and Facilitating Factors 8

Key Considerations for Education Decision Makers 9

Appendix 10

References 11

Challenges and Facilitating Factors

District and school support for instructional coaching is a critical factor in facilitating an effective program. The support of key leaders and stakeholders in the district—including the superintendent, assistant superintendent, and (depending on governance structures) the board of education—is often necessary to secure and maintain funding and buy-in. In Haverton County, leadership changes actually helped promote the initiative: In 2013, a new superintendent was brought in who placed a priority on math instruction in the district. In Colina County, however, the implications of the anticipated change in district leadership are uncertain. It is unclear whether the new superintendent will embrace the vigorous efforts to implement the blended Algebra I program. Because the principal of Franklin High School chose to pay for a math coach out of his Title I funds, he is in a position to sustain the coaching role, but the coach’s effectiveness may erode if the network of district-level supports dissolves.

Figure 4. Additional Recommendations

- ✓ Buy-in from senior district leadership is critical.
- ✓ Coaching activities should be consistent with the vision for the school or district.
- ✓ Sustained funding for coaches is needed for these efforts to reach full potential eventually, but the culture of collaboration is a residual benefit even after funding ends.
- ✓ Parents and the community must be educated about what you are doing and why.
- ✓ Teachers—and coaches—need resources to stay on top of best practices supported by research, particularly in rural districts where there is more professional isolation.

As with many districts in the country, Haverton County’s funds and resources are limited. According to the coach, “The assistant superintendent, he’s had to go to bat to keep this funding. He’s been a huge support from the beginning. We’ve had the teachers do presentations and there is a board member who really gets it and that helps.” In allocating resources, it is also worth weighing the option of taking time and effort to educate parents about the importance of coaching and why teacher practices are changing. The coach explained, for example, that parents are seeing their students being challenged with the new approach to teaching. Although students, by all accounts, are largely responding to and enjoying the shifts in teaching and learning, the parents are used to a more traditional approach and some have expressed concern or resistance to the coach’s role in the district. The coach

recognizes this as an issue that is important to address, but stated that with her already limited resources and time on-site, “I haven’t the time to do as good of a job of building buy-in with the community.”

A district’s setting—whether rural or urban—may have associated challenges and supports. The coach in Haverton County, for example, noted that the rural location means she has few opportunities to exchange ideas with other coaches or math experts. As she remarked, “We are ready for more research and tips...it’s the problem of the vacuum of isolation

Introduction	1
Lessons From the Field	2
Haverton County at a Glance	3
Colina County at a Glance	4
Why Districts Turned to Mathematics Coaches	5
Coaching Activities in Haverton and Colina	6
Implementation of Algebra I Coaching	7
Challenges and Facilitating Factors	8
Key Considerations for Education Decision Makers	9
Appendix	10
References	11



here. We need more of a network.” When asked how she “stays sharp” as a coach, she noted that she could use more resources and guidance about how to stay on top of best practices. In Colina County, however, the math coach for Franklin High School has ample access to resources, peer collaboration, and professional discourse. Indeed, her role as a coach has enabled her to take on new responsibilities within the district, thus providing opportunities for professional growth.

Both Haverton County and Colina County appear to have sufficient political and financial support to sustain their Algebra I coaches, at least in the near future. In Haverton County, the superintendent and assistant superintendent voiced strong support for the program and for the coach. They also emphasized that mathematics is a priority in the district. Although additional funding in Haverton County for the program could help it realize its full potential, the coach noted that even if the funding were to disappear at this point, the culture of collaboration among teachers would likely persist for the foreseeable future. In addition, one of the high school teachers became certified as a math mentor so she can get a bit more money from the county to meet regularly with the newest teacher at the high school in this role. This particular teacher, in reflecting on where the teachers are now after four years into working with the coach, shared the following: “We weren’t ready to not have a coach after the second year [of the coaching program]. We weren’t ready yet. ...but we can do some of it on our own now.” This teacher also noted that the group of high school Algebra I teachers lives in the community and has ties to the community. She stated, “We will be here for the next 20-some years. We aren’t leaving, so we are really building up a culture and shift in the way we are doing things and developing our capacity to do things.” At the same time, when the department chair was asked about the sustainability of the professional community in the mathematics department if the coaching position was eliminated, he remarked:

I think quite a bit of it would go on, but you would lose the search for new ideas. Teachers don’t have enough time to plan and search out new ideas. I would still want to have the meetings with the other teachers to get together with the teachers, but the coaching provides the time and helps ensure these [meetings] occur. The coach helps keep the ‘feeling’ going.

Finally, this profile highlights the importance of hiring the right person for the job. A coach needs to have the right personality to build rapport among teachers and the technical knowledge and skills to serve as a credible expert. But the coach is also critical in securing buy in and ongoing support among school- and district-based leaders and shaping the instructional context systemically.

Introduction	1
Lessons From the Field	2
Haverton County at a Glance	3
Colina County at a Glance	4
Why Districts Turned to Mathematics Coaches	5
Coaching Activities in Haverton and Colina	6
Implementation of Algebra I Coaching	7
Challenges and Facilitating Factors	8
Key Considerations for Education Decision Makers	9
Appendix	10
References	11



1

2

3

4

5

6

7

8

9

10

11

Key Considerations for Education Decision Makers

Introduction 1

Lessons From the Field 2

Haverton County at a Glance 3

Colina County at a Glance 4

Why Districts Turned to Mathematics Coaches 5

Coaching Activities in Haverton and Colina 6

Implementation of Algebra I Coaching 7

Challenges and Facilitating Factors 8

Key Considerations for Education Decision Makers 9

Appendix 10

References 11

Key Considerations for Education Decision Makers

Table 4 reflects key findings from a systematic literature review of instructional coaching in Algebra I (Walters, 2014; see www2.ed.gov/programs/dropout/instructionalcoaching092414.pdf). It also reflects the considerations that program developers and administrators should consider as well as reflections on how these findings played out in the districts profiled here. A separate perspective brief from this project highlights reactions from practitioners in the field to findings from the systematic literature review (Walters, 2016; see <https://www2.ed.gov/programs/dropout/instructionalcoachingperspectivebrief.pdf>).

Table 4. Findings From Instructional Coaching Literature Review

The strongest coaching programs...	Program developers or administrators should consider...	Was this reflected in Haverton and Colina?
...used well-trained, expert coaches.	...ensuring that well-trained coaches are hired or that coaches with less training are properly trained. This may have an impact on the timeline of the coaching program because the coaches need to be trained before they begin working with teachers.	At both sites, the coaches were well-regarded math teachers before assuming their coaching positions. Not only were these coaches well-qualified and knowledgeable, but in the case of Haverton County, one individual—the math coach—saw the need for instructional support in mathematics and spearheaded the coaching initiative. Although Haverton County is rural and isolated, Haverton High School’s math classrooms now reflect the best, research-based practices in Algebra I.
...included structured feedback on a narrow set of instructional practices.	...identifying the key aspects of instruction that the coaching will target. Instead of launching general coaching initiatives, focus on a subset of practices that teachers can digest and incrementally improve.	In Haverton, the coach solicited feedback from teachers to identify particular instructional practices and tailored feedback to meet the teachers’ needs. The coach asked teachers to come to her with a mathematics problem in the classroom, for example—a concept students did not understand. She also had teachers identify practices they felt they were ready to take on and wanted to improve. Rather than a one-size-fits-all approach, she asked teachers to observe her delivering a lesson, asked where they saw the most student engagement or response, and then asked what the teacher wanted to work on based on the observation.

- Introduction 1
- Lessons From the Field 2
- Haverton County at a Glance 3
- Colina County at a Glance 4
- Why Districts Turned to Mathematics Coaches 5
- Coaching Activities in Haverton and Colina 6
- Implementation of Algebra I Coaching 7
- Challenges and Facilitating Factors 8
- Key Considerations for Education Decision Makers 9**
- Appendix 10
- References 11



The strongest coaching programs...	Program developers or administrators should consider...	Was this reflected in Haverton and Colina?
...emphasized strategies to improve student engagement and student reasoning.	...promoting coaching programs with strong student engagement and reasoning components. Increasing student engagement and promoting student thinking might involve coaching programs with classroom discourse strategies, interesting tasks, problem-solving activities, or all of the above.	At both sites, the coaches supported teachers' efforts to engage students in self-directed problem-solving activities. Because this was initially a struggle for teachers, the coaching was described as critical to the implementation of these new, more ambitious practices.
...took more than one year to produce an impact.	...crafting policies that give the coaching programs enough time to take root. It may take two to three years to get the anticipated results, and this information should inform funding decisions and evaluation timelines.	Learned that developing a strong rapport with teachers is essential to effective coaching, but can take time. In both districts, coaches eased into their roles, acknowledging their outsider status by easing into less threatening topics. Now, teachers in both districts say they are very comfortable with the coach in their classrooms, but as one said, "I would have been so intimidated" at the start. Although not highlighted specifically in the research, rapport building is perhaps a necessary precondition of coaching. Both districts' coaching programs were tied to helping teachers implement content standards and curriculum that were conceptually demanding. The programs assumed that helping teachers implement more complex forms of instruction would take more than one year.
...may have a stronger influence on volunteer teachers.	...specifying the teacher population the policy is targeting. Does a sufficient number of volunteer teachers exist to warrant the coaching initiative? If the coaching program is required of all teachers, the program may affect the nonvolunteers and volunteers differently. Program developers and administrators may need to incorporate additional time into the planning and implementation process for nonvolunteers to fully engage with the program.	Neither district addressed this finding directly, but both coaching programs assumed that teachers were in different places and had different needs. Instead of a one-size-fits-all approach, the programs maximized engagement through personalization and attention to individual needs.
...may have used Web- and video-based delivery systems.	...investing in video technology to allow coaches and teachers to communicate, depending on the structure of the program (e.g., number of teachers, number of coaches, geographic area). A growing body of research suggests that investing in video technology can allow coaches and teachers to share information efficiently, particularly when videos are used as the basis of in-person or remote feedback meetings focused on a narrow, specific set of instructional practices. This approach may be especially useful to districts that have a limited number of coaches or have teachers spread out across a wide geographic area.	The mathematics coach in Haverton County increasingly relied on video tools to communicate with teachers as the program progressed. Alternative modes of communication increased the likelihood that the district could sustain the coaching, even with more limited funds.

Introduction	1
Lessons From the Field	2
Haverton County at a Glance	3
Colina County at a Glance	4
Why Districts Turned to Mathematics Coaches	5
Coaching Activities in Haverton and Colina	6
Implementation of Algebra I Coaching	7
Challenges and Facilitating Factors	8
Key Considerations for Education Decision Makers	9
Appendix	10
References	11



1

2

3

4

5

6

7

8

9

10 Appendix

11

Introduction 1

Lessons From the Field 2

Haverton County at a Glance 3

Colina County at a Glance 4

Why Districts Turned to Mathematics Coaches 5

Coaching Activities in Haverton and Colina 6

Implementation of Algebra I Coaching 7

Challenges and Facilitating Factors 8

Key Considerations for Education Decision Makers 9

Appendix 10

References 11



Appendix. Sampling, Data Collection, and Analytic Methods

In selecting sites for *Promoting Student Success in Algebra I*, the primary objective was to identify districts and schools that implemented activities associated with the five topical areas that are the focus of this project (instructional practices, professional development, instructional coaching, curricular alignment, and supplementary learning opportunities). In addition, for the practice profiles to be of greatest utility to practitioners and policymakers, we sought to identify sites that were implementing the practices identified in the research (see Research Briefs) as showing the strongest evidence of effectiveness. To enhance the probability that practitioners would identify with the school and district sites, we sought variation with regard to urbanicity, school size, and student demographics. Briefly, the selection criteria included the following:

- Criterion 1: Sites will represent exemplars.
- Criterion 2: Each site should provide some evidence of improved outcomes.
- Criterion 3: Sites will reflect geographic diversity.
- Criterion 4: Sites will reflect the diversity of enrolled students.

Relative to instructional coaching, our specific expectations were as follows:

Instructional Coaching: Selected sites will be schools that are implementing a mathematics coaching program focused on improving teachers' mathematics instruction. Although mathematics coaches within these schools may be responsible for various activities, the majority of their time should be spent working directly with teachers to plan, deliver, and evaluate mathematics instruction. Ideally, the school will have established a policy for hiring and training mathematics coaches to ensure that individuals in these roles are leaders with knowledge of mathematics content, mathematics teaching and learning, and teacher leadership. In addition, the school should have a support structure in place to provide coaches with the time and resources needed to work with teachers in this capacity.

Introduction	1
Lessons From the Field	2
Haverton County at a Glance	3
Colina County at a Glance	4
Why Districts Turned to Mathematics Coaches	5
Coaching Activities in Haverton and Colina	6
Implementation of Algebra I Coaching	7
Challenges and Facilitating Factors	8
Key Considerations for Education Decision Makers	9
Appendix	10
References	11



Both sites profiled here provided evidence of improvement in practices related to Algebra I. At Franklin High School, in Colina County, the school reported that after the first year of coaching, the school made significant gains in proficiency on the State Algebra I test, wherein the number of students exhibiting proficiency in Algebra I increased by 16 percent from the prior year. The other site, Haverton High School, improved Algebra I proficiency rates by 14 percentage points during a three-year period and continues to outpace the rate of improvement in the rest of the State.

Teams of at least three project staff visited each of the profiled sites following training in data collection procedures. On-site data collection activities included interviews, focus groups, observations of professional learning opportunities, document data collection, and informal classroom observations. The interview and observation protocols were developed by project staff with expertise in algebra content, research on instructional coaching, and qualitative research. Each protocol was piloted and refined based on feedback from practitioners before being fielded for this project. A total of 21 educators were interviewed across the two sites: 3 administrators and 7 teachers in Haverton County, and 5 administrators and 6 teachers in Colina County. All interviews and focus groups were audio-recorded and transcribed. Following the school and district visits, the project team immediately summarized their observations. These observations were used to identify initial themes and supported the development of codes.

Interview and focus group transcriptions were coded in Dedoose, a qualitative data analysis software package. Prior to coding, the project team developed a set of codes with associated definitions and trained staff for the consistent application of codes. In addition, as a quality control procedure, a senior staff member reviewed the coded data. Coded data enabled the project team to retrieve data on common topics across interviews. For example, code retrieval allowed the team to analyze all the relevant data points on topics such as district supports or developing rapport. The coding process ultimately allowed for the identification of prominent themes and informed the development of the Key Considerations.

Introduction	1
Lessons From the Field	2
Haverton County at a Glance	3
Colina County at a Glance	4
Why Districts Turned to Mathematics Coaches	5
Coaching Activities in Haverton and Colina	6
Implementation of Algebra I Coaching	7
Challenges and Facilitating Factors	8
Key Considerations for Education Decision Makers	9
Appendix	10
References	11



1

2

3

4

5

6

7

8

9

10

11 References

Introduction 1

Lessons From the Field 2

Haverton County at a Glance 3

Colina County at a Glance 4

Why Districts Turned to Mathematics Coaches 5

Coaching Activities in Haverton and Colina 6

Implementation of Algebra I Coaching 7

Challenges and Facilitating Factors 8

Key Considerations for Education Decision Makers 9

Appendix 10

References 11

References

Deiger, M., Fendt, C., Harris, R., Mazboudi, M., Mosak, E., & Wenze, S. (2009). *CMSI High School Algebra I for middle grade students: What does it look like and how do students perform?* Chicago, IL: Prairie Group. Retrieved from http://www.theprairiegroup.org/uploads/2/5/4/2/25428343/8th_grade_alg_final_rpt_102609.pdf

Heppen, J., Sorensen, N., Allensworth, E., Walters, K., Rickles, J., Taylor, S., & Michelman, V. (2016). The struggle to pass algebra: Online vs. face-to-face credit recovery for at-risk urban students. *Journal of Research on Educational Effectiveness*. Retrieved from <http://www.tandfonline.com/doi/abs/10.1080/19345747.2016.1168500>

National Center for Education Statistics. (2015). *Public high school graduation rates*. Washington, DC: Author. Retrieved from http://nces.ed.gov/programs/coe/indicator_coi.asp

Oriheula, Y. R. (2006). *Algebra I and other predictors of high school dropout*. Dissertation Abstracts International. Retrieved from ProQuest Dissertations and Theses (Accession Order No. AAI3249717).

Silver, D., Saunders, M., & Zarate, E. (2008). *What factors predict high school graduation in the Los Angeles Unified School District* (California Dropout Research Project Report 14)? Santa Barbara, CA: University of California.

Smith, T. S. (2014a). *Curricular alignment strategies to support student success in Algebra I: Research brief*. Washington, DC: U.S. Department of Education. Retrieved from <https://www2.ed.gov/programs/dropout/curricularalignment092414.pdf>

Smith, T. S. (2014b). *Instructional strategies to support student success in Algebra I: Research brief*. Washington, DC: U.S. Department of Education. Retrieved from <https://www2.ed.gov/programs/dropout/instructionalpractices092414.pdf>

Sorensen, N. (2014). *Supplemental learning strategies to support student success in Algebra I: Research brief*. Washington, DC: U.S. Department of Education. Retrieved from <https://www2.ed.gov/programs/dropout/learningsupports092414.pdf>

Stoelinga, T., & Lynn, J. (2013). *Policy brief: Algebra and the underprepared learner*. Chicago, IL: Research on Urban Education Policy Initiative, University of Chicago. Retrieved from <http://c-stemec.org/wp-content/uploads/2013/08/Algebra-and-Underprepared-Learner.pdf>

U.S. Department of Education. (2010). *ESEA blueprint for reform*. Washington, DC: Office of Planning, Evaluation and Policy Development, U.S. Department of Education.

Walters, K. (2014a). *Instructional coaching to support student success in Algebra I: Research brief*. Washington, DC: U.S. Department of Education. Retrieved from <https://www2.ed.gov/programs/dropout/instructionalpractices092414.pdf>

Walters, K. (2014b). *Professional development strategies to support student success in Algebra I: Research brief*. Washington, DC: U.S. Department of Education. Retrieved from https://www2.ed.gov/programs/dropout/instructional_coaching092414.pdf

Walters, K. (2016). *Instructional coaching to support student success in Algebra I: Perspective brief*. Washington, DC: U.S. Department of Education. Retrieved from <https://www2.ed.gov/programs/dropout/instructionalcoachingperspectivebrief.pdf>

Introduction 1

Lessons From the Field 2

Haverton County at a Glance 3

Colina County at a Glance 4

Why Districts Turned to Mathematics Coaches 5

Coaching Activities in Haverton and Colina 6

Implementation of Algebra I Coaching 7

Challenges and Facilitating Factors 8

Key Considerations for Education Decision Makers 9

Appendix 10

References 11



1000 Thomas Jefferson Street NW
Washington, DC 20007-3835
877.322.8700

www.air.org

Copyright © 2017 American Institutes for Research. All rights reserved.



This brief was produced under U.S. Department of Education Contract No. ED-ESE-12-0-0081 with American Institutes for Research. Ivonne Jaime served as the contracting officer's technical representative. The views expressed herein do not necessarily represent the positions or policies of the Department of Education. No official endorsement by the U.S. Department of Education of any product, commodity, service or enterprise mentioned in this publication is intended or should be inferred.