What the Challenge of Algebra for All has to Say About Implementing the Common Core:
A Statistical Portrait of Algebra I in Thirteen Large Urban School Districts

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Abstract

Implementing the Common Core Standards in mathematics will present challenges for those large urban school districts that serve high minority and high poverty student populations, where many students enter high school having failed to master the intermediate middle grades mathematics essential to succeeding in Algebra I. This article reports on data from a cluster randomized study of 5,000 students and 130 teachers from 13 school districts that compared two Algebra I curricula for freshmen. Results find that in large urban school districts serving largely minority and high-poverty populations, students enter 9th grade several grade levels behind in mathematics and tend to be taught by relatively new and inexperienced teachers, leaving them ill-equipped to succeed in Algebra 1 without additional supports.
Overview

There is compelling evidence that challenging coursework in high school, particularly in mathematics, leads to positive education and life outcomes for students across the achievement spectrum. Growing awareness of this trajectory has fueled an almost 30 year effort to raise educational standards in the United States, which has culminated in the nearly universal adoption of the common core standards. Moreover, in return for receiving flexibility waivers from elementary and secondary education act (No Child Left Behind) over two thirds of the nation’s states to date have pledged to begin implementation of the common core standards over the next two years. This attempt to raise the bare minimum on what is expected in terms of academic performance will in part succeed or fail depending on the extent to which students and teachers are prepared to meet the challenge of more demanding high school mathematics curriculums. Recent research has shown that success in the 9th grade is critical to student’s future outcomes. Students that fail courses in the 9th grade and do not earn on-time promotion to the 10th grade, have greatly increased odds of not receiving a high school diploma. Students that receive good grades in the 9th grade, are put on a trajectory towards college success (Allensworth et. al., 2009, Roderick 2009). Thus in order for the common core to succeed, its implementation efforts will need to include the supports all students will require to successfully master
challenging mathematical content in the 9th grade. Unless state and district leaders have a clear understanding of the extent to which students need support to succeed, and take action to provide that support, their well-intended policies may have the unintended consequence of increasing ninth graders’ chances of being held back and eventually of dropping out of high school. It will also be essential to understand how the degree of difficulty in implementing the high school common core will vary by place, and in particular what it will look in school districts that primarily educate low income minority students. Since if insufficient supports are provided in these locales, than the implementation of the common core, designed specifically to prepare all students to be college and career ready, may instead further deepen the current college going gap between low income minority students and their more advantaged peers.

Insights into the type and intensity of supports that will be needed to enable all students to succeed with the high school mathematics common core, can be gleaned from prior efforts to raise mathematics achievement outcomes over the past decade, in particular efforts to establish “Algebra for All” policies and to make Algebra I a mandatory course for all ninth grade students. To better estimate the degree of difficulty districts face in ensuring student success when they raise the bar in mathematics, we examined background characteristics of nearly 5,000 students and over 130 teachers in 9th grade Algebra I classes in 13 large urban school districts across the nation (Note 1). The study assesses
students’ readiness to succeed in mastering the Algebra I content by analyzing the composition, abilities, and needs of students and teachers in Algebra I classes. It also describes continuing challenges even after schools have implemented interventions that provide students with specialized gap-closing curricula and additional time to learn Algebra. Our analyses confirm that, in large urban school districts that serve high-poverty populations, a majority of students enter high-school without having achieved a mastery of middle grades mathematics and are unprepared for Algebra I in their freshmen year. The study also suggests that current instructional interventions are not yet powerful enough to create more positive trajectories for many of these young people.

**Algebra for All Background**

Most school districts today generally require students to complete three credits in mathematics - and in some cases four credits. Increasingly, all students are, at a minimum, required to pass algebra and geometry to receive a high school diploma (Blank & Langesen, 1999; Christie, 2001). Since members of minority groups and low-income students historically have had less access to challenging mathematics classes (Gamoran & Hannigan, 2000), the focus of ‘algebra for all policies’ has often centered on the large urban school districts where minority and low-income students are most concentrated. States such as New York and Texas, and school districts such as Los Angeles, Philadelphia, Chicago, Baltimore,
Milwaukee and Portland (OR) not only required students to pass Algebra I, but additionally required that they take it in their freshman year. These policies are designed to provide students with the opportunity to complete more advanced mathematics courses such as Algebra II, Trigonometry, and Calculus in high school, laying a firmer foundation for success in post-secondary schooling.

A consequence of mandating algebra for all in districts where many students enter underprepared, however, is that Algebra I course failure rates are typically quite high. In Los Angeles, 44% of 2004-05 freshmen failed Algebra I (Helfand, 2006), while in Milwaukee roughly half of the freshmen failed algebra, on average, over a 7-year period after an “algebra for all” policy was implemented (Ham and Walker, 1999). In Chicago, while such a policy did result in more students completing 9th grade with a credit in Algebra I, failure rates still increased, grades slightly declined, test scores did not improve, and students were no more likely to enter college (Allensworth, et. al., 2009). Looking at states and districts that required students to take Algebra in the 8th grade, Loveless (2008) found that while such policies were borne of good intentions the direct effect was that many students were placed in advanced courses for which they were not adequately prepared. While the consequences are clear for those misplaced students, the effects also extend to those more advanced students as teachers faced with students of a wide range in abilities watered down the course material. Such
situations arose most often in urban school districts serving predominantly minority and high-poverty student populations.

As state and district leaders move to implement the new Common Core standards in mathematics (Common Core, 2010), it is important they move forward with a clear picture of the current reality. Although over the next decade or more, improvements in elementary and middle grade instruction will hopefully reduce the number of students who enter the 9th grade lacking the prior preparation needed to succeed in advanced coursework, for the millions of students who will pass through the 9th grade between then and now it is important to understand the level, type, and intensity of support they will need to succeed in common core mathematics courses. This study begins to map the challenges through empirical examination of 9th grade students and math teachers in 13 large urban school districts that serve predominantly minority and low-income students.

**Research Design**

The analyses presented in this article are drawn from a study that compared the use of two different approaches to teaching Algebra I to underprepared freshmen in school districts where “Algebra for All” policies had been established. Eight school districts participated in the first year and five more in the second for a total of 13 school districts, 131 teachers and 4,941 students. In each school district, half the participating high schools were randomly assigned to
implement a specialized course in the first semester that focused on developing students’ intermediate math skills, followed by Algebra I in the second semester (the treatment condition) (Note 2). The other half of schools were assigned to implement to Algebra I for the entire year, often referred to as Stretch Algebra (control condition). In both conditions, students received a double-dose of math all year long, with two 45 minute periods of math per day. Results found that students in schools randomly assigned to the treatment condition experienced significantly greater gains in intermediate math achievement, and experience a significantly different set of classroom practices that were related to more positive attitudes and high algebra achievement levels. Treatment students also had end-of-year algebra achievement levels equivalent to those of Stretch Algebra students despite spending only half as much instructional time on Algebra, and their Algebra scores were significantly related to gains made in intermediate mathematics (Author, 2012).

This article presents descriptive analyses from the study sample to illustrate the degree of challenge facing schools and districts both prior to, and following, the intervention. Sample data were collected from both primary and secondary sources. Student achievement was compared by administering pre and post standardized tests in both intermediate mathematics and Algebra I to determine the differential effects of the two course sequences on student learning. Each school district also provided data on student demographics, attendance, and
prior achievement levels from their student information systems, and additional information on each school was obtained from the U.S. Department of Education’s Common Core of Data (CCD). Student and teacher surveys also were administered to study participants to measure attitudes and classroom practices (Note 3).

We begin by describing the school districts that participated in the study and the prior mathematics achievement levels of their incoming freshmen. Drawing from survey data, we then offer analysis of the teaching qualifications and prior experience of 9th grade Algebra teachers, and describes student and teacher attitudes towards mathematics. We conclude the report by showing student outcomes from their 9th grade Algebra I courses before offering some discussion of the analyses and their relevance for Algebra for all policies.

Section I: The School Districts

As school districts were recruited to join the study on a need basis, the data sample is not a probabilistic one that is nationally representative, but rather a purposive sample of large urban school districts that serve predominantly underprivileged student populations. Table 1 below provides descriptive measures for the 13 study districts in comparison to the roughly 17,000 school districts that make up the national population. Four of the study districts are amongst the 100 largest school districts in the nation, and 10 amongst the top 500.
The smallest study district enrolls more students than 90% of all districts nationwide. The students served by these study districts are also more disadvantaged than most. On average, more than half their students are minority and Free/Reduced Lunch program eligible. The study districts also have higher student-teacher ratios on average, indicating that they not only must provide educational services to more, and more under-privileged, students than other districts, but do so with fewer resources. Such districts typify the school districts that are most likely to both implement, and struggle with, an Algebra I for all 9th graders policy.

**Figure 1** shows the geographic locations of the participating school districts. While they come predominantly from the east coast, several stretch out through the south and west providing the regional variation from which to extrapolate to other large urban school districts across the nation.

**Section II: The Students**

**Figure 2** below shows the 8th grade mathematics course marks for the 4,941 students in our sample. One fifth of the 9th grade students had failed their 8th grade mathematics course and another fifth had received a mark of ‘D’, indicating they have not developed the required math skills and knowledge needed to succeed in Algebra I the following year. Only 6% of the students had earned an A,
indicating that very few students in the sample entered 9th grade, with a strong command of middle grade mathematics.

This skills gap also is reflected in the students’ achievement scores on the CTBS standardized achievement test. Taken at the beginning of their 9th grade year, Figure 3 shows that less than one-quarter of the students in the sample entered 9th grade at grade level. Roughly four out of five students entered below grade level, while more than half were more than two grade levels below in their mathematics achievement levels and one-quarter were more than four grade levels below. It is not possible to know to what extent the lowest levels of achievement reported reflected actual levels or that students had simply stopped trying. But in either case, the data indicates a large number of students who enter the 9th grade with either very low skill levels or a sense of hopelessness.

Studies of students entering high school below grade level in mathematics find that these students often have mastered basic mathematical operations involving whole numbers: that is, by and large, they can add, subtract, divide, and multiply. For example, data from the National Assessment of Educational Progress (NAEP) indicate that 99% of 13-year-olds in the United States “have initial understanding of the four basic operations” in mathematics and “can read information from charts and graphs, and use simple measurement instruments” (Campbell, Hombo, & Mazzeo, 2000, p. 18). Data from the Third International
Mathematics and Science Study (TIMSS) confirm that even in the four high poverty school districts (Chicago, Jersey City, Rochester, NY, and Miami-Dade) participating in the 1999 Repeat study, most students had grasped very basic mathematical skills: between two-thirds and four-fifths of the eighth grade students successfully solved the items involving whole number computation, estimation, and interpreting data in tables (Mullis et al., 2001). On all of these items, students in the high poverty districts performed at or above the international median, in line with the performance of students in Japan and in Montgomery County, MD, an affluent community with a highly regarded school system.

Ninth grade students below grade level in mathematics struggle to perform operations with rational numbers, e.g. fractions, decimals, and percentages, and with integers, e.g. positive and negative numbers, areas which the National Mathematics Advisory Panel (2008) identified as critical foundational knowledge for success in Algebra. These two domains are conceptually challenging, procedurally complex, and vital to success in standards-based high school mathematics (Kilpatrick, Swafford, & Findell, 2001). They cannot be mastered by simply extending one’s knowledge of whole number operations, and they are made more challenging by the fact that implicit rules learned for operating with whole, positive numbers do not apply (Stavy & Tirosh, 2000). Consequently, rational numbers and integers take time, experience, and clear and well-organized
instruction to comprehend and master (Kilpatrick, et. al, ibid). Traditionally, operations with rational numbers, and, to a lesser extent, integers, are the primary focus of instruction in upper elementary and middle school grades. However, both the TIMSS study and research conducted in high poverty middle schools indicates that not all middle school students receive sufficient and effective instruction in these topics (Balfanz, MacIver, and Byrnes, 2006; Mullis et al., 2001; Cogan, Schmidt, and Wiley, 2001). All of this, in turn, indicates that significant numbers of students enter high school without the mathematical knowledge and reasoning skills that are assumed by the college prep strand of high school mathematics courses and a growing number of high stakes tests now given as early as the 9th grade.

Without mastery of these intermediary math skills, most students in the study sample struggled in Algebra I. This is strongly exemplified by their scores on the Orleans-Hanna Algebra aptitude test which combines students’ 8th grade course marks with their raw scores from a brief standardized mathematics test to estimate their readiness to succeed in Algebra. **Figure 4** presents students’ predicted national percentile scores for an end-of-year algebra test based upon their Orleans-Hanna scores taken at the beginning of 9th grade. As opposed to a normal distribution with an average or median around the 50th percentile mid-mark, we see that the distribution is completely skewed to the lower end of the percentile range. For this sample of students, one-quarter bottomed out with an
estimated score in the 1st percentile based upon poor 8th grade course marks and low math test scores. Half of the students scored below the 7th percentile, three-quarters below the 19th, and 90% below the 35th percentile. Only five percent of the students sample scored at or above the 50th percentile on the Orleans-Hanna test, emphasizing how under-prepared these students are for facing algebra content material when they start 9th grade.

Taken together these data present a daunting challenge. They indicate that in high poverty urban districts it is not uncommon for the majority or near majority of students to enter their 9th grade mathematics classroom having earned a D or F in mathematics the year before, scoring two or more grade levels behind on nationally normed tests of intermediate mathematics skills, and falling among the 10% of students least likely to succeed in 9th grade algebra under business as usual instructional and curricular conditions.

**Section III: The Teachers**

Under No Child Left Behind (NCLB) regulations, classroom teachers are required to be credentialed in their subject area, and this was largely the case the classes we studied. Of the 131 teachers in our sample, three-quarters were fully certified in secondary mathematics, and another fifth had temporary certification (Figure 5). Only one in ten were not certified in high school mathematics.
Similarly, over three-quarters of the teachers in our sample (77%) had either a major or minor post-secondary degree in mathematics. These percentages are similar to national averages reported from the High School Longitudinal Study of 2009, which however also found a gap between 9th grade students in the lowest SES quintile and those in the highest for whom 74% and 82% of math teachers respectively were fully state certified (LoGerfo, et. al. 2011). These SES differences were also consistent when comparing students by achievement level, as 75% of students in the bottom quintile of mathematics achievement had fully certified math teachers as compared to 81% of students in the top achievement quintile.

However, while the 9th grade classes in our sample were taught by certified mathematics teachers, there is evidence that they were taught disproportionally by new and inexperienced staff. **Figure 6** shows the distribution of teaching experience for our sample of teachers and confirms that a substantial portion of the 9th grade Algebra teachers were inexperienced; 36% of teachers in the sample had been teaching full-time for three or fewer years, 43% had been teaching 9th grade mathematics for three or fewer years, and almost half (47%) had three or fewer years of experience teaching Algebra. Almost one quarter, 22%, were teaching Algebra I for the first time. These numbers are similar to national averages for disadvantaged students which find that roughly one third of 9th grade students who fall into either the bottom SES or achievement
quintile are taught by math teachers in their first three years of full-time teaching (LoGerfo, et. al. 2011).

Moreover, as shown in Figure 7, only half of the teachers in the sample had volunteered to teach 9th grade algebra, with the other half assigned to teach 9th grade algebra by their school administrators. While staff assignment is typically at the discretion of school administrators, senior staff is more often able to select or influence their assignments, with newer staff being assigned to less desirable courses such as, apparently, 9th grade Algebra.

Combined with the large percent of new teachers, we begin to see a trend of the least experienced staff being assigned by school administrators to teach 9th grade algebra. These findings align with other research finding that the lowest status teachers typically are assigned to teach 9th grade (Neild & Farley, 2008), a pattern which is doubly crippling when coupled with a student population that is underprepared to succeed with the Algebra I curriculum and lacking intermediary math skills.

**Section IV: Student and Teacher Attitudes**

While the students and teachers in our sample of Algebra I courses may enter underprepared and inexperienced to succeed with the challenging curriculum, most at least enter with the confidence and belief that they can
succeed. As part of the larger Algebra study comparing two different curricula for underprepared freshmen, student and teacher surveys were also administered at the start of the school year asking them about their attitudes towards mathematics. As can be seen below in Figures 8 & 9, both groups believe that they could succeed in Algebra I.

As can be seen in Figure 8 below, there was divided opinion among the students in terms of liking math: 54% said they did, 46% said they did not. Interestingly, while half the students received D’s or F’s in 8th grade mathematics, 66% of students reported that they believe themselves to be good at math and 87% stated that they could comprehend the material, this may suggest that a good number of students do not do well in math because, for likely a complex set of reasons, they do not try hard. The vast majority of students (78%) also reported that they believed in the utility of learning Algebra. The vast majority of teachers also expressed the belief that Algebra was an important subject, and more importantly, that all students could master it. Thus most students and teachers in the Algebra I classes in our sample stated interest in the material, believed in its value and professed their ability to master it.

**Section V: The Reality of Algebra for All**

As mentioned above, in districts such as Los Angeles, Milwaukee, and Chicago that have mandated Algebra I for all incoming freshmen, failures rates in
the course appear to have increased to nearly 50%. Because our study was designed for a different purpose, the data do not allow us to make a direct comparison to these districts, nor do they allow for a pre/post-intervention comparison of district-wide Algebra I failure rates in the 13 districts in our sample. We are, however, able to report end-of-ninth-grade course marks (including “Fs”) and scores on standardized assessments for all sample students.

Recall that, as part of the study, students all received a “double-doses” of mathematics, whereby they received an additional 45-60 minute period of mathematics instruction each day throughout the year, providing teachers with additional time to go over new material or to review prior material where students were missing skills. About half of the students in our sample also received a specialized “gap closing” curriculum during the first semester of their freshman year, followed by an Algebra I course in the second semester.

Even with this doubling of instructional time for mathematics for all sample students, and specialized curriculum for some, nearly a quarter (23%) of the nearly 5,000 students in the study failed their Algebra course at the end of ninth grade (Figure 10). Another quarter failed to master the material as indicated by a final grade of “D.”

The lack of mastery also is reflected in the distribution of achievement scores on the end of 9th grade CTB standardized algebra exam, displayed in
Figure 11. The sample of students is concentrated well below national norms with the vast majority of student scores below the 50\textsuperscript{th} national percentile. The sample average was in the 28\textsuperscript{th} national percentile, with 50\% of students scoring below the 24\textsuperscript{th} percentile, 75\% of students scoring below the 45\textsuperscript{th} percentile, and 90\% below the 59\textsuperscript{th} percentile.

Hence, though actual failure rates in Algebra among students in our study were roughly half of those reported in other large urban districts that implemented algebra for all policies, the districts in our sample still have far to go in securing success in Algebra for all students. In short, additional time combined with gap closing curriculum made a statistically significant and educationally substantial difference, and hence should be a part of the tools and tactics applied to enable all students to succeed with the common core. However, in and of themselves, these interventions alone were not sufficient, to enable the majority of students who entered high school hugely under-prepared for Algebra to succeed in it.

Section VI: Variation across Districts

Sample descriptive reported above were heterogeneous across sample districts. In terms of students’ prior achievement levels, in 12 of 13 school districts students averaged marks between D+ to C in their 8\textsuperscript{th} grade mathematics courses and averaged below the 20\textsuperscript{th} national percentile on the Orleans-Hanna Algebra aptitude exam. In all districts, student averages were more than one level
below grade on the CTBS Intermediate Math test. There was slightly more variation between districts in terms of teacher backgrounds. In four districts, a large proportion of teachers were not highly qualified, lacking full or even temporary certifications in secondary mathematics, or similarly lacking post-secondary degrees in mathematics, either majors or minors. Consistently across districts, approximately half of teachers had been assigned to their 9th grade algebra course, as opposed to having volunteered. In terms of teachers’ experience, the sample averages were eight years of full-time teaching and five years of teaching both 9th grade math and algebra, with the majority of districts being below the sample averages. Student and teacher attitudes as self-reported by survey were very heterogeneous across districts. Finally, end-of-year algebra achievement measures were also very consistent across districts with students in all districts averaging a D or C mark in their second semester algebra course and between the 22nd and 39th national percentile on the CTB Algebra Achievement exam.

**Discussion**

Both traditional Algebra I courses and the high school common core for mathematics assume that students have mastered basic and intermediate math skills, including multiplication and division of fractions, decimals, and negative numbers. This study confirms that many freshmen in schools and districts that
serve predominantly low income and minority will struggle in Algebra and with the new common core mathematics standards due to poor prior preparation in intermediate mathematics.

The challenges faced by the Algebra for All movement, provide a cautionary note to states and districts as they move forward with the implementation of the high school common core for mathematics. Clearly, a “business as usual” approach for these students on top of a more challenging curriculum is unlikely to produce a substantially higher percentages of disadvantaged students who are college ready, and it may accelerate the high school dropout rate as numerous students begin high school by failing their 9th grade math course and conclude that they do not have the capacity to earn a high school diploma, let alone a college degree.

This study also suggests that initial efforts to provide additional supports in the form of a specialized “gap closing” curriculum and extra learning time, while beneficial, may be insufficient interventions in themselves for a majority of struggling students. All students in the sample studied here had twice the normal amount of time in mathematics their freshman year, and about half took a unique course that focused specifically on increasing their operational fluency and introducing them to Algebraic thinking in hands-on and engaging ways. Their levels of achievement by the end of the ninth grade year, however, remain far
Students who enter high school below grade level in mathematics certainly will require appropriate curricula and additional instructional time to pass Algebra I and succeed in the common core. The results of this study make it clear that it is time for education researchers, program developers, and policymakers to think more deeply about the kinds of reforms and intervention supports that adolescents in low performing schools and systems need to succeed in advanced mathematics. If anything, the data shows that no single reform strategy will likely be sufficient. Clearly, more experienced and skilled teachers, with specific training, on how to teach advanced mathematics to high school students with poor prior preparation and the often limiting motivations and beliefs that comes with prior experience with course failure are needed. Yet, many of these districts have been trying to upgrade teacher quality for a decade or more. More effective integration of middle grades and early high school mathematics curriculum and instruction is a natural area for further development, as is the smart use of technology. Programs also must be informed by greater understanding of the multitude of ways in which poverty interferes with learning, especially in schools where being poor is the norm, not the exception. Young people growing up in families where the adults may or may not be just scraping by need comprehensive supports that extend well beyond the classroom. Putting this altogether, will in the end likely involve both
new school design and a willingness to amass and concentrate federal and state funding streams towards comprehensive evidence based strategies that provide the intensity of supports needed to enable students who enter high school lacking a good middle grades education and a prior history of course failure to succeed. Avoiding continuing failure and high dropout rates need not mean pulling back on efforts to provide all students with a common core high school curriculum that prepares them for college and career success (Author, 2012). Instead, it can be a call for schools and communities to develop more informed collaborative strategies for supporting high need students in their pursuit of educational and socio-economic advancement. For this to succeed, though, it will be first necessary, to acknowledge the magnitude of the challenge.
Notes

(1) The data is drawn from a study conducted by the Center for Social Organization of Schools (CSOS) at Johns Hopkins University, funded by US Department of Education Institute for Education Sciences (grant #101198).

(2) The specialized curriculum was Transition to Advanced Mathematics (TAM) developed at Johns Hopkins University.

(3) Missing data were addressed through multiple imputation.

(4) Not all high schools with a ninth grade in each of the 13 study districts participated in the study, but statistics for the 46 participating schools indicate they serve student populations typical of those that attend public, non-selective, regular or vocational high schools in their school districts.
References


www.tea.state.tx.us/student.assessment/resources/studies/correlation.pdf
Table 1 – Demographic Statistics of School Districts

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<th>Student Enrolment</th>
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Source: National Center for Education Statistics, Common Core of Data, 2008-09.
Figure 1 – Map of Participating School Districts
Figure 2 – 8th Grade Mathematics Course Marks of Participating 9th Grade Students
Figure 3 – CTBS Mathematics Grade Equivalent Scores
Figure 4 – Orleans-Hanna Algebra Aptitude Test Scores
Figure 5 – High School Mathematics Teaching Certification

- Full Certification: 73%, 73%
- Temporary Certification: 18%, 18%
- Series 1, No Certification: 9%, 9%
Figure 6 – Years Teaching Experience
Figure 7 – Prior Backgrounds

- Majored in Math: 61%
- Minored in Math: 27%
- Prior Block Teaching Schedule: 69%
- Prior Classroom Coach Experience: 29%
- Prior Stretch Algebra Experience: 39%
- Volunteer to Teach Algebra: 52%
- Assigned to Teach Algebra: 48%
The Challenge of Algebra for All

Figure 8 – Student Attitudes

- **I am good at math:**
  - Strongly Agree, 15%
  - Agree, 51%
  - Disagree, 26%
  - Strongly Disagree, 8%

- **I like mathematics:**
  - Strongly Agree, 14%
  - Agree, 41%
  - Disagree, 30%
  - Strongly Disagree, 16%

- **When I try hard, I can usually understand math:**
  - Strongly Agree, 32%
  - Agree, 55%
  - Disagree, 11%
  - Strongly Disagree, 3%

- **I will probably use Algebra in the future:**
  - Strongly Agree, 32%
  - Agree, 46%
  - Disagree, 15%
  - Strongly Disagree, 7%

Legend:
- I am good at math
- I like mathematics
- When I try hard, I can usually understand math
- I will probably use Algebra in the future
### Figure 9 – Teacher Attitudes

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<td>Algebra, Geometry, &amp; Algebra II are important courses for all HS students</td>
<td>50%</td>
<td>39%</td>
<td>6%</td>
<td>2%</td>
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<tr>
<td>All Students are capable of learning Algebra 1</td>
<td>26%</td>
<td>39%</td>
<td>9%</td>
<td>2%</td>
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*All Students are capable of learning Algebra 1*
Figure 10 – 9th Grade Algebra Course Marks

- Series 1, C: 27%
- Series 1, D: 23%
- Series 1, F: 23%
- Series 1, B: 18%
- Series 1, A: 8%
Figure 11 – End-of-Year CTB Algebra Achievement Test, National Percentiles Scores