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Original Paper

Impact of the Algebra I End of Course Examination on African American Students Obtaining a Standard High School Diploma

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Abstract

The state of Florida requires all students complete Algebra I and pass the End of Course Examination (EOCE) to graduate with a standard high school diploma. Algebra I EOCE results indicate that many African American students do not pass the examination. This research sought to determine if there is a relationship between African American students' failure to pass the Algebra I EOCE and graduate with a standard diploma. Four hypotheses, null and alternative were tested. Two ninth-grade cohorts, 2013-2014 and 2014-2015 comprised the sample. Data were analyzed using t test and one-way analyses of variance (ANOVA). Results indicate a significant relationship between African American students' failure to pass the Algebra I EOCE and graduation with a standard high school diploma.

Keywords

African American, algebra I end of course examination, Florida, standard high school diploma, graduation

1. Introduction

Standardized testing is a prominent and controversial measure used by local school districts and states to evaluate student academic achievement and hold teachers, principals, and superintendents accountable. In the 1990s, Florida's education officials used standardized tests results from the fourth, fifth, and tenth grades to identify low-performing schools. The Florida Comprehensive Assessment Test (FCAT) replaced the State Student Assessment Test (SSAT) as the measurement used for reading and mathematics in 1998. In 1999, every school received a letter grade, A to F, based on factors, including student FCAT scores, dropout rate, attendance, and discipline. Florida has focused on outcome-based data and results of measures such as district-wide testing and end of course examinations (EOCEs). In 2003, the state began requiring students to pass the Grade 10 FCAT Reading and Mathematics End of

Course Examinations (EOCEs). Geometry and Biology EOCEs were added in 2012, United States History in 2013, and Civics in 2014. Beginning in 2015, all Florida students were required to pass the Algebra I EOCE to receive a standard high school diploma (Houchens, 2012). Florida's overall student achievement, as assessed by EOCEs, improved over the last few years; however, many African American students perform below the proficiency level of 3, which is needed to pass the Algebra I EOCE. Given this requirement, the state of Florida prevents students from graduating from high school with a standard diploma until they have passed the Algebra I EOCE.

Statewide, in the 2010-2011 school year, 55% of ninth graders failed the Algebra I EOCE. Ninth-grade African American female and male students' failure rates were 66% and 71%, respectively (Florida Department of Education, 2014).

African American students' failure to meet the required Level 3 or better on the Algebra I EOCE presents an ongoing challenge for Florida school districts. If African American students continue to underperform on the Algebra I EOCE, many will not receive a standard high school diploma. Balfanz and Byrnes (2006, 2012) concluded that students who fail several attempts to pass EOCEs eventually drop out of school.

Ninth grade is a challenging time in many students' lives, given a surge of cognitive, social, and emotional development changes. Gregory and Fergus (2017) showed that cognitive development affects the academic posture of students in poverty—a reality that is prevalent with many African American students. Socially, African American male students are subjected to stereotypical labels that often interfere with their cognitive development. Barriers to normal emotional development, such as unstable home environments and puberty, can impede African American students academic progress (Gregory & Fergus, 2017). African American ninth-grade students must navigate socioemotional changes and other school-related stressors such as suspension, retention, and special education classification. Other school-related issues also include subpar facilities that adversely impact student learning and teachers not prepared to address African American students. Educators require preservice preparation and ongoing professional development that assists them to understand that most African American children are not underdeveloped are developmentally delayed (Bowman, Comer, & Johns, 2018).

From an equity perspective, African American students have exhibited lower levels of mathematics achievement than other ethnic groups (Pintrich & Zusho, 2002). This lower achievement obliges further examination of African American students' mathematics achievement predictors. African American students have also been underrepresented in science, technology, engineering, and mathematics (STEM) fields (worldwidescience.org) and have encountered stereotypes that undermine their achievement. Therefore, understanding how relevant mathematics instruction and school racial climate promote or corrode beliefs and achievement also has implications for issues of equity and justice (Diemer, Marchand, Mckellar, & Malanchuk, 2016).

Davis and Farran (2018) asserted that African American males become aware of racialized stereotypes regarding their mathematics abilities at an early age. On average, African American males have been overrepresented in negative educational outcomes and underrepresented in positive results. These

disparities owe to a wide range of issues regarding opportunities to learn. Still, a misperception remains among some members of the American public that these disparities exist because of innate differences in ability. As a result, African American males are often confronted with lowered expectations, even when achieving at high levels (www.naeyc.org). Furthermore, many African American students never receive opportunities to present their abilities in educational environments.

Setting expectations and attitudes aside, researchers have also found disparities in access to high-quality mathematics learning across educational environments. Young children belonging to racial minorities who attend urban schools in low-income areas tend to have fewer opportunities to master mathematics knowledge. Davis and Farran (2018) conducted a study of urban prekindergarten classes and showed that mathematics teaching and activities took place much less frequently than literacy teaching and activities. Researchers have also found that in the elementary grades, and beyond, that African Americans are underrepresented in gifted programs. Given these disparities in opportunities to learn throughout early childhood and elementary school, it should come as no surprise that only 13% of African American eighth-grade students were proficient in mathematics, compared to 43% of European American students (National Assessment of Educational Progress, 2015).

Latimore (2005) stated that for many African American children educated in urban and rural schools, the connection has been lost between the skills needed to be economically viable in the future. To function independently as an adult, and to make a creative contribution to society, students must have their abilities developed in school as part of the learning process on a daily basis.

1.1 Algebra I End of Course Examination as a Barrier

Scholars have long been interested in the mathematics scores of African American students. Each state has a way of measuring students' mathematics proficiency. In Florida, students are administered an examination each spring. Many of Florida's African American students, female, and male, have not been performing at an acceptable proficiency level as indicated by Algebra I EOCE results. Florida requires all students to pass the Algebra I EOCE to receive a standard high school diploma. Thompson and Davis (2013) stated that Algebra I acts as a gatekeeper of advanced mathematics courses in high school, which also provide access to collegiate Science Technology Engineering and Mathematics (STEM) disciplines that serve as entryways to high-paying occupations (National Science Board, 2012). Algebra I is a major precursor to higher level mathematics achievement in college (New York Equity Coalition, 2018). Thus, African American students' failure to pass the Algebra I EOCE prevents them from obtaining a standard high school diploma, which impacts their high school aftermath (i.e., transition into the military, a career, postsecondary education, or earning a living-wage).

Florida has not mandated pass for other EOCEs (i.e., Civics, Algebra II, and Biology), so the pass precondition for obtaining the standard high school diploma does not apply to these subjects. Some students find Algebra particularly difficult to understand because of the abstract reasoning required to comprehend the subject. For example, there are students who cannot replace numbers with variables, an abstraction that is essential to mastering Algebra. Although pedagogical instructional lessons exist that

can assist students who struggle with abstract reasoning to learn the mathematical concepts integral to mastering Algebra I, many teachers do not offer such lessons to help ensure the success of all learners. The combination of students' struggles and teachers' limited skill sets have created the myth that African American students simply cannot learn Algebra I.

1.2 Purpose of the Study

It has not been established that a relationship exists between African American students' failure to pass the Algebra I EOCE and graduate with a standard high school diploma. This research sought to determine whether a relationship exists between African American students' failure to pass the Florida Algebra I EOCE and graduation with a standard high school diploma.

2. Method

No variables were manipulated for this research. The interaction between the dependent variable, standard high school diploma issued to African American students, and independent variables, Algebra I EOCE results for two ninth-grade cohorts and type of school district, rural, urban, or suburban already existed. Hence, this research is categorized as ex post facto. An Ex post facto design allowed for the examination of archived data of African American students' Algebra I EOCE results and graduation with a standard high school diploma. T-test was employed to test four hypotheses. A one-way analysis of variance (ANOVA) was employed to determine relationship between African American students completing the Algebra I EOCE and those who graduated with a standard high school diploma.

2.1 Hypotheses

Four null and alternative hypotheses were formulated for testing:

H_{01}: There is no relationship between African American students' Florida Algebra I EOCE and graduation with a standard high school diploma.

H_{a1}: There is a relationship between African American students' Florida Algebra I EOCE and graduation with a standard high school diploma.

H_{02}: There is no relationship between African American male students' Florida Algebra I EOCE and graduation with a standard high school diploma.

H_{a2}: There is a relationship between African American male students' Florida Algebra I EOCE and graduation with a standard high school diploma.

H_{03}: There is no relationship between African American female students' Florida Algebra I EOCE and graduation with a standard high school diploma.

H_{a3}: There is a relationship between African American female students' Florida Algebra I EOCE and graduation with a standard high school diploma.

$\underline{H}_{04}$: There is no relationship between African American male and female students in rural, urban, and suburban schools Florida Algebra I EOCE and graduation with a standard high school diploma.

H_{a4}: There is a relationship African American male and female students in rural, urban, and suburban schools Florida Algebra I EOCE and graduation with a standard high school diploma.

2.2 Sample

The state of Florida has 67 traditional school districts. Fifteen school districts, five each, rural, urban, and suburban were selected for this research. The sample consisted of African American ninth-grade students enrolled in Algebra I and who completed the EOCE during the 2013-2014 and 2014-2015 school years in fifteen selected school districts.

2.3 Data Collection Procedures

Data for this research was publicly available through the Florida Department of Education website, which provides student assessment scores for all Florida school districts. The Florida Department of Education Office of Accountability's interactive reporting website was accessed to obtain pass and failure outcomes of all African American ninth-grade students who completed the Algebra I EOCE and standard high school diplomas awarded in the 15 selected Florida school districts. Algebra I EOCE pass and fail outcomes for African American students for the school years 2013-2014 and 2014-2015 and those who graduated with a standard high school diploma for the years 2017-2018 and 2018-2019 were downloaded from the Florida Department of Education website.

3. Results

Descriptive statistics were processed to characterize the ninth-grade sample. Descriptive statistics were also computed for the independent variable, African American ninth grades students Algebra I EOCE results and the dependent variables, type of school district, rural, urban, or suburban and graduation with a standard high school diploma. who completed and passed the Algebra I EOCE in the 2013-2014 and 2014-2015 school years and who graduated with a standard high school diploma.

Table 1 shows the minimum, maximum, means, and standard deviations for ninth-grade African American male students who completed and passed the Algebra I EOCE in the 2013-2014 and 2014-2015 school years and African American male students from the cohorts who graduated with a standard high school diploma. Table 2 shows descriptive statistics for ninth-grade African American female students for the 2013-2014 and 2014-2015 school years who completed and passed the Algebra I EOCE in the 2013-2014 and 2014-2015 school years and who graduated with a standard high school diploma.

Table 1. African American Male Ninth-Grade Students in 15 Florida School Districts by Algebra I End of Course Examination and Standard High School Diplomas Earned

School year and male student category	Minimum	Maximum	*M*	*SD*
2013-2014				
Took Algebra 1 EOCE	10	1941	478.87	603.45
Passed Algebra 1 EOCE	1	404	108.40	132.51
Graduated in this cohort	16	2158	753.73	850.88

Obtained standard high school diploma in this cohort	7	2031	572.33	699.31
2014-2015				
Took Algebra 1 EOCE	13	1940	516.33	621.74
Passed Algebra 1 EOCE	0	423	106.47	136.10
Graduated in this cohort	29	2996	824.40	992.13
Obtained standard high school diploma in this cohort	12	2261	625.47	762.50

Note. $N = 15$. EOCE = end of course examination.

Table 2. African American Female Ninth-Grade Students in 15 Florida School Districts by Algebra I End of Course Examination and Standard High School Diplomas Earned

School year and female student category	Minimum	Maximum	*M*	*SD*
2013-2014				
Took Algebra 1 EOCE	0	1834	471.80	586.87
Passed Algebra 1 EOCE	0	447	126.07	152.09
Graduated in this cohort	19	2964	817.13	981.78
Obtained standard high school diploma in this cohort	12	2309	647.47	788.84
2014-2015				
Took Algebra 1 EOCE	0	1910	496.47	603.44
Passed Algebra 1 EOCE	0	464	114.67	148.46
Graduated in this cohort	17	3054	845.60	1027.49
Obtained high school diploma in this cohort	12	2610	725.60	891.24

Note. $N = 15$. EOCE = end of course examination.

Table 3 shows the descriptive statistics for all ninth-grade African American students—female and male—for the 2013-2014 school year.

Table 3. All Ninth-Grade African American Students in 15 Florida School Districts Relative to the Algebra I End of Course Examination and Standard High School Diplomas

School year and student category	Minimum	Maximum	*M*	*SD*
2013-2014				
Took Algebra 1 EOCE	10	3775	951.33	1190.00
Passed Algebra 1 EOCE	3	851	234.47	284.03
Graduated in this cohort	35	5943	1637.53	1964.11
Obtained standard high school diploma in this cohort	19	4340	1219.13	1488.21
2014-2015				
Took Algebra 1 EOCE	15	3850	1012.80	1224.46
Passed Algebra 1 EOCE	1	887	221.27	284.55
Graduated in this cohort	46	6050	1670.00	2019.46
Obtained standard high school diploma in this cohort	24	4871	1351.07	1653.62

Note. N = 15. EOCE = end of course examination.

3.1 Inferential Statistical Analysis

Algebra I EOCE scores and corresponding number of African American students obtaining the high school high school diploma were considered for the 15 rural, urban, and suburban Florida school districts. A One-sample *t* test and one-way ANOVAs were used to test the hypotheses.

3.2 Hypotheses Testing Results

3.2.1 Results for H_{01} and H_{a1}

Ho1 stated that there is no relationship between African American students' Florida Algebra I EOCE and graduating with a standard high school diploma. Ha1 stated that there is a relationship between African American students' Florida Algebra I EOCE and graduating with a standard high school diploma. Ninth-grade African American students who completed the Algebra I EOCE in 2013-2014 and 2014-2015 and graduated in 2017-2018 and 2018-2019 comprised the sample.

Table 4 shows *t*-test results for African American students in years 2013-2014 and 2014-2015. T-test results show a statistically significant difference between the students who completed the Algebra I EOCE and those who graduated with a standard high school diploma. The null hypothesis H_{01} was rejected. This result indicates that some African American students did not pass the Algebra 1 EOCE, which prevented them from graduating with a standard high school diploma.

Table 4. T-test Results for All Ninth-Grade African American Students in 15 Florida School Districts Relative to the Algebra I EOCE and Graduation with a Standard High School Diploma

			Difference		
				95% CI	
School year and student category	*t*(14)	*p*	*M*	*LL*	*UL*
2013-2014					
Took Algebra 1 EOCE	3.096	.008	951.33	292.33	1610.33
Passed Algebra 1 EOCE	3.197	.006	234.47	77.18	391.76
Graduated in this cohort	3.229	.006	1637.53	549.85	2725.22
Obtained standard high school diploma in this cohort	3.173	.007	1219.13	394.99	2043.28
2014-2015					
Took Algebra 1 EOCE	3.204	.006	1012.80	334.71	1690.88
Passed Algebra 1 EOCE	3.012	.009	221.27	63.69	378.85
Graduated in this cohort	3.203	.006	1670.00	551.66	2788.34
Obtained standard high school diploma in this cohort	3.164	.007	1351.07	435.32	2266.81

Note. CI = confidence interval; EOCE = end of course examination; *LL* = lower limit; *UL* = upper limit.

3.2.2 Results for H_{02} and H_{a2}

Ho2 stated that there is no relationship between African American male students' Florida Algebra I EOCE and graduating with a standard high school diploma. Ha2 stated that there is a relationship between African American male students' Florida Algebra I EOCE and graduating with a standard high school diploma. Ninth-grade African American male students who completed the Algebra I EOCE in 2013-2014 and 2014-2015 and graduated in 2017-2018 and 2018 and 2019 constituted the sample.

Table 5 shows *t*-test results of hypothesis testing for male African American students. T-test results showed a statistically significant difference between students who failed to pass the Algebra 1 EOCE and those who graduated with a standard high school diploma. The significance level was less than .05 for each relationship tested, therefore the null hypothesis H_{02} was rejected. The results indicate that some African American male students did not pass the Algebra I EOCE, which prevented them from obtaining the high school diploma.

Table 6 shows ANOVA results for African American male students who completed the Algebra I EOCE in school year 2013-2014. The ANOVA was used to compare the mean of African American male students who completed the Algebra I EOCE in 2014, passed in 2014, graduated and received a standard

high school diploma in 2017. The results were significant (p = .001). The Algebra 1 EOCE is a barrier to African American male students graduating with a standard high school diploma.

Table 5. T-test Results for African American Male Ninth-Grade Students in 15 Florida School Districts Relative to the Algebra I EOCE and Graduation with a Standard High School Diploma

			Difference		
				95% CI	
School year and male student category	*t*(14)	*p*	*M*	*LL*	*UL*
2013-2014					
Took Algebra 1 EOCE	3.073	.008	478.87	144.69	813.05
Passed Algebra 1 EOCE	3.168	.007	108.40	35.02	181.78
Graduated in this cohort	3.431	.004	753.73	282.53	1224.94
Obtained standard high school diploma in this cohort	3.170	.007	572.33	185.07	959.60
2014-2015					
Took Algebra 1 EOCE	3.216	.006	516.33	172.03	860.64
Passed Algebra 1 EOCE	3.030	.009	106.47	31.10	181.84
Graduated in this cohort	3.218	.006	824.40	274.98	1373.82
Obtained standard high school diploma in this cohort	3.177	.007	625.47	203.21	1047.73

Note. All tests two tailed. CI = confidence interval; EOCE = end of course examination; *LL* = lower limit; *UL* = upper limit.

Table 6. Analysis of Variance for Ninth-Grade African American Male Students Algebra I EOCE in 2013-2014 in 15 Florida School Districts

Source	*SS*	*df*	*MS*	*F*	*p*	Bayes factor
Between-group	88016.463	2	44008.231	11.992	.001	34.423
Within-group	44039.202	12	3669.933			
Total	132055.664	14				

Table 7 shows results of an ANOVA for African American males who completed the Algebra I EOCE in school year 2014-2015. The ANOVA was used to compare the means of African American male students who completed the Algebra I EOCE in 2015, passed in 2015, graduated and received a standard

high school diploma in 2018. The results were significant (p = .004). The Algebra 1 EOCE was a barrier to African American male students graduating with a standard high school diploma.

Table 7. Analysis of Variance Ninth-Grade African American Male Students Algebra I EOCE in 2014-2015 in 15 Florida School Districts

Source	*SS*	*df*	*MS*	*F*	*p*	Bayes factor
Between-group	60985.347	2	30492.673	9.069	.004	12.488
Within-group	40348.866	12	3362.405			
Total	101334.213	14				

3.2.3 Results for H_{03} and H_{a3}

Ho3 stated that there is no relationship between African American female students' Florida Algebra I EOCE and graduating with a standard high school diploma. Ha3 stated that there is a relationship between African American female students' Florida Algebra I EOCE and graduating with a standard high school diploma.

Ninth-grade African American female students who passed the Algebra I EOCE in 2013-2014 and 2014-2015 and graduated in 2017-2018 and 2018-2019 comprised the sample.

Table 8 shows results of hypothesis testing for these students. T-test results showed a statistically significant difference between the students who completed the Algebra I EOCE and those who graduated with a standard high school diploma. The level of significance was less than .05 for the hypothesis tested. The null hypothesis H_{03} was rejected. This means that some African American female students did not pass the Algebra I EOCE, which prevented them from graduating with a standard high school diploma.

Table 8. T-test Results for African American Female Ninth-Grade Students in 15 Florida School Districts Relative to the Algebra I EOCE and Graduation with a Standard High School Diploma

			Difference		
				95% CI	
School year and female student category	*t*(14)	*p*	*M*	*LL*	*UL*
2013-2014					
Took Algebra 1 EOCE	3.114	.008	471.80	146.80	796.80
Passed Algebra 1 EOCE	3.210	.006	126.07	41.84	210.29
Graduated in this cohort	3.223	.006	817.13	273.44	1360.83
Obtained standard high school diploma in this cohort	3.179	.007	647.47	210.62	1084.31

2014-2015					
Took Algebra 1 EOCE	3.186	.007	496.47	162.29	830.64
Passed Algebra 1 EOCE	2.991	.010	114.67	32.45	196.88
Graduated in this cohort	3.187	.007	845.60	276.59	1414.60
Obtained standard high school diploma in this cohort	3.153	.007	725.60	232.05	1219.15

Note. All tests two tailed. CI = confidence interval; EOCE = end of course examination; *LL* = lower limit; *UL* = upper limit.

Table 9 shows ANOVA results for African American female students who completed the Algebra I EOCE in school year 2013-2014. The ANOVA was used to compare the mean of African American female students who tested in 2014, passed the Algebra I EOCE in 2014, graduated in 2017, and received a standard high school diploma in 2017. The results were statistically significant (p = .009). The Algebra I EOCE was a barrier to African American female students graduating with a standard high school diploma. Table 10 shows ANOVA results for African American female students who completed the Algebra I EOCE in school year 2014-2015. The ANOVA was used to compare the mean of African American female students who tested in 2015, passed the Algebra I EOCE in 2015, graduated in 2018, and received a high school diploma in 2018. The results were statistically significant (p = .001). The Algebra I EOCE was a barrier to African American females graduating with a standard high school diploma.

Table 9. Analysis of Variance Ninth-Grade African American Female Students Who Completed the Algebra I EOCE in 2013-2014 in 15 Florida School Districts

Source	*SS*	*df*	*MS*	*F*	*p*	Bayes factor
Between-group	69880.935	2	34940.468	7.116	.009	5.619
Within-group	58919.464	12	4909.955			
Total	128800.400	14				

Table 10. Analysis of Variance Ninth-Grade African American Female Students Who Completed the Algebra I EOCE in 2014-2015 in 15 Florida School Districts

Source	*SS*	*df*	*MS*	*F*	*p*	Bayes factor
Between-group	94541.928	2	47270.964	14.677	.001	75.950
Within-group	38648.851	12	3220.738			
Total	133190.780	14				

3.2.4 Results for H_{04} and H_{a4}

Ho4 stated that there is no relationship between African American male and female students in rural, urban, and suburban schools' Florida Algebra I EOCE and graduating with a standard high school diploma. Ha4 stated that there is a relationship between African American male and female students in rural, urban, and suburban schools' Florida Algebra I EOCE and graduating with a standard high school diploma.

African American students who completed the Algebra I EOCE in 2013-2014 and 2014 and 2015 and graduated in 2017 and 2018 comprised the sample.

Table 11 shows the results of hypothesis testing for African American with respect to rural, urban, and suburban districts. T-test results showed no statistically significant differences among rural, urban, and suburban schools for the students who completed the Algebra I EOCE and graduated with a standard high school diploma. The significance level was greater than .05 for each hypothesis. No relationship was detected among rural, urban, and suburban schools with respect to African American students Algebra I EOCE and obtaining the standard high school diploma.

Table 11. T-test Results for All Ninth-Grade African American Students in 15 Florida School Districts Relative to the Algebra I EOCE and Graduation with a Standard High School Diploma

				Difference	
				95% CI	
School year and student category	*t*(2)	*p*	*M*	*LL*	*UL*
2013-2014					
Took Algebra 1 EOCE	1.245	.339	951.33	−2335.31	4237.97
Passed Algebra 1 EOCE	1.323	.317	234.48	−528.18	997.14
Graduated in this cohort	1.280	.329	1637.53	−3866.29	7141.35
Obtained standard high school diploma in this cohort	1.249	.338	1219.13	−2979.50	5417.76
2014-2015					
Took Algebra 1 EOCE	1.278	.330	1012.80	−2397.30	4422.90
Passed Algebra 1 EOCE	1.244	.340	221.19	−543.94	986.32
Graduated in this cohort	1.264	.334	1670.00	−4015.81	7355.81
Obtained standard high school diploma in this cohort	1.245	.339	1351.07	−3316.94	6019.08

Note. CI = confidence interval; EOCE = end of course examination; *LL* = lower limit; *UL* = upper limit.

4. Concluding Discussion

African American students' performance on the Algebra I EOCE and graduation with a standard high school diploma for the 2013-2014 and 2014-2015 ninth grade cohorts in 15 Florida school districts were the subject of this research. Hypotheses test results did not indicate any differences among district types for the Algebra I EOCE and African American students who obtained a standard high school diploma. The results for Ho1 Ho2, and Ho3 indicated a relationship between the Algebra I EOCE and African American male and female students obtaining a standard high school diploma. An average of thirty-seven African American students in the 2013-2014 cohort for rural schools who completed the Algebra I EOCE passed and obtained a standard high school diploma. The numbers for the 2014-2015 cohort revealed a similar trend of performance in rural schools. Results revealed that African American females performed better than African American males despite being represented by lower numbers in each cohort. However, there was a significant relationship between African American females and the Algebra I EOCE and obtaining a standard high school diploma. Algebra I is the gateway to higher-level mathematics on both the secondary and post-secondary levels of education (New York Equity Coalition, 2018).

Based upon the results of this research, African American students are not only in jeopardy of not obtaining a standard high school diploma, but the lack of skills in Algebra will impact future career mobility, which will depend on mathematical skills. African American males in rural areas were the lowest performing subgroup in this study. The average number of rural, suburban, and urban students who obtained a standard high school diploma was lower than the average number of urban students tested in the 2013-2014 and 2014-2015 cohorts. African American males in suburban and urban schools had a larger number of students who obtained standard high school diplomas in the 2013-2014 and 2014-2015 ninth-grade cohorts.

The similarity of results for African American female and male students in rural, suburban, and urban districts indicated that there were larger numbers of students who graduated without a standard high school diploma. Further, the ratio of African American males who graduated without a standard high school diploma was higher than the number who obtained a diploma in rural, urban, and suburban schools. African American male's results show lower rates of passage on the Algebra I EOCE in each of the fifteen Florida counties. The number of high school diplomas issued to African American males was lower in all rural, urban, and suburban counties. These results provide relevant information to continue the dialogue of African American male student performance in Algebra I and mathematics overall. African American female students' performance was consistently higher than African American male student performance in rural, urban, and suburban schools for the fifteen counties. The results of this study suggest that the Algebra I EOCE is a significant factor in African American students graduating with a standard high school diploma in the state of Florida.

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