The Black Male Student: Early Indicators of Algebra 1 Failure

Colloquium

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Poor international mathematics performance testing by American students has been documented as early as the 1960s (Mayfield & Glenn, 2008).

Documentation of poor achievement via the achievement gap:

- Black and White students
- 1965
- Large scale surveys with national samples (Hedges & Nowell, 1999)
An unacceptable number of Black males between the ages of 14-16 years of age continue to fail algebra 1 mathematics at the high school level.

The failure of algebra 1 mathematics at the high school level often has lead to a lower curriculum track assignment for the Black male student.

The new track assignment is absent access:
- STEM (Science Technology Engineering & Mathematics)

(Riegle-Crumb & Grodsky, 2010; Ballon, 2008)
The purpose of this quantitative study was to identify those factors that contributed to the high failure rate among Black males 14-16 years of age enrolled for the first time in a high school algebra 1 course taught in an urban public school in order to find ways to navigate around these barriers inhibiting Black male success in algebra 1 and thereby increase the college acceptance rate for matriculating Black males.
Among 4th grade males, Black males enter school with:
- Lower math
- Lower reading
- Lower vocabulary skills

Specific interest has been placed on the low academic performance of the Black male when compared to other ethnic groups

(Kafele, 2012; Whitting, 2006; Sandowski, 2006)
African American youth have unique issues that present barriers to success in their academic performance (Sommers, Owens, & Pilawsky, 2008).

Not all Black males get the opportunity to take Algebra in middle school (Davis, 2014).

- Efficient note taking
- Actual problem Solving
8th Grade Black male math performance on National Assessment of Educational Progress (NAEP) from 1990 and 2015

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<thead>
<tr>
<th></th>
<th>1990</th>
<th>2015</th>
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<tbody>
<tr>
<td></td>
<td>NAEP Score</td>
<td>Black Male Achievement Gap</td>
</tr>
<tr>
<td>Black</td>
<td>188</td>
<td>260</td>
</tr>
<tr>
<td>Hispanic</td>
<td>201</td>
<td>+20</td>
</tr>
<tr>
<td>White</td>
<td>220</td>
<td>+32</td>
</tr>
<tr>
<td>Asian</td>
<td>225</td>
<td>+37</td>
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(Adapted from NAEP 1990 and 2015)
RESEARCH QUESTION #1

- What differences exists, if any, in the learning styles between those students that passed algebra 1 and students who failed algebra 1 during first semester of the 2016-2017 school year?
What differences exists, if any, in the mathematics self-efficacy among students who passed algebra 1 and those students who failed algebra 1 during first semester of the 2016-2017 school year?
RESEARCH QUESTION #3

- What were the early predictors, if any, between the preferred learning styles, math self-efficacy scores, and the standardized test performance scores of participants 14-16 years of age who passed algebra 1 and participants who failed algebra 1 first semester of the 2016-2017 school year.
STUDY SIGNIFICANCE

- To assist those students who still struggle
- For math instructors
- To contribute to the conversation concerning mathematics
- Participant benefits
- To start new conversation about pedagogical change
**Quantitative**

- Relationships in a statistical way
- Chi Square analysis for RQ #1 and RQ #2
- 2 groups with nominal data
- 2 sample *t*-test for RQ #3

(Leedy & Ormond, 2013)
-Student's who passed algebra 1 during 1\textsuperscript{st} semester of the 2016-2017 school year

-Students who failed algebra 1 during 1\textsuperscript{st} semester of the 2016-2017 school year
INSTRUMENTS UTILIZED

- Learning Style Inventory
- Math Self-Efficacy Scale
- Both measurements given to participants on the same day
- Total time required 1hr 5min.
FINDINGS RQ #1

- What differences exists, if any, in the learning styles between those students that passed algebra 1 and students who failed algebra 1 first semester of the 2016-2017 school year?

- RQ #1 – No statistically significant relationship was identified.

- Specifically, \( \chi^2 (4, N=41), p = .498 \) represents the results from the Chi Square analysis
What differences exists, if any, in the mathematics self-efficacy among students who passed algebra 1 and those students who failed algebra 1 first semester of the 2016-2017 school year?

RQ #2- No statistically significant relationship was identified.

Specifically, \( \chi^2 (30, \ N =42) =, \ p = .312 \) represented the results from the Chi Square analysis.
What were the early predictors, if any, between the preferred learning styles, math self-efficacy scores, and the standardized test performance scores of participants 14-16 years of age who passed algebra 1 and participants who failed algebra 1 first semester of the 2016-2017 school year.

RQ #3 No statistically significant relationship was identified.

Specifically, $t(40) = .19, p = .56$, $t(41) = .21, p = .248$, and $t(41) = .01, p = .858$ were the results generated from the t-test analysis.
CONCLUSIONS

- A relationship does not exist between preferred learning styles and math success for urban Black males who passed or failed high school algebra 1.

- A relationship does not exist between the math self-efficacy scores and math success for urban Black males who passed or failed high school algebra 1.

- A relationship does not exist among the preferred learning style, math self-efficacy, and standardized test scores between urban Black males who passed or failed high school algebra 1.
In tandem:
- Preferred learning styles
- Math self-efficacy
- Standardized test performance
- Do not make for suitable predictors of high school algebra 1 failure.

The existence of the negative phenomena remains
IMPLICATIONS

- An Investigative step has been established
- Practitioner Behaviors must change
- An explanation for the phenomena has not been identified
- Acknowledgement that other variables to algebra 1 failure exist
LIMITATIONS

- At this time, the sample size of the participant group may not be as robust as the researcher would like.
- Pen to paper examination
- End of the day participant assessment
- More extensive use of technology
RECOMMENDATIONS

- Recognition and acceptance of a negative phenomenon in mathematics concerning Black males.
- Future research should be both quantitative and qualitative.
- Future research should be in partnership with large urban district.
- Future participant groups should be > 2000.
REFERENCES


