



# A Review of New Math and Algorithms in the Lives of African American Males and Implications both Terms Have Meant to the Urban Community

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## Abstract

New math and Algorithms are two variables that have been heavily implemented into the lives of the African American community both, positively and negatively in recent years. However, data from both the medical and educational environments have indicated that African Americans have suffered negatively in the medical field by not receiving adequate medical treatments and in education by encountering curricula like new math that produced lowered-level academic standards. Reviewing data from the Nation Report CardReport (2023) Report and researcher opinions discussing new math and Algorithms will be the groundwork for this paper. The author will review the plight of the African American male student and how new math and algorithms have created significant problems for this group of people in society.

## Subject Areas

Educational Technology

## Keywords

New Math, Algorithms, and the Urban Community

## 1. Introduction

Both terms such as algorithms and new math instructions have been both influential and persuasive around the world today, especially for African American male students. For example, according to Dourish (2016) [1] the term “algo-

rithm” is defined as a type of computer output, finding, or outcome that describes a “computer procedure.” In a United States Report (2016) [2], President Obama’s administration offered one solution to fighting against racial biases with algorithm outputs, President Obama stated that

To avoid exacerbating biases by encoding them into technological systems, we need to develop a principle of “equal opportunity by design” designing data systems that promote fairness and safeguard against discrimination from the first step of the engineering process and continuing throughout their lifespan.

New math, in contrast, operates on a different level in that one of its purposes is to allow students additional opportunities to figure out math problems by using “more than one approach other than traditional math instructions” (Velez, 2023, p. 3). [3]

### **Background of New Math and Algorithms**

The new math curriculum development can be attributed partially to both the University of Illinois and the University of Maryland during the 1950s. According to Hayden (1981) [4], school committee members, staff members, and teachers all collaborated to help new freshmen students improve their mathematical abilities. One way to expedite this task was by increasing the advanced course load of math classes at both the high school and college levels for incoming freshmen. Funding for new math was contributed in part by the Carnegie Foundation and committee members adding their guidance in the promotion of new math. One reason concerns grew from faculty members concerning freshmen students was due to fears that incoming students could not compete with international students abroad. To combat this disparity, committee members re-directed students away from learning traditional mathematics and instead invested more time in students learning more guided discovery concepts.

The discussion will go over topics like algorithms and new math instructions and how both terms have negatively impacted African American males in both public education and medical facility environments. According to Lapowsky (2014) [5], in quoting CEO Diamandis of the XPRISE Foundation mentioned that.

Advances in quantum computing and the rapid evolution of AI and AI agents will lead to shaping voters, and ads, and will create new ways to misrepresent reality and perpetuate falsehoods.

Borgesius (2019) [6] mentioned that an algorithm can determine which attributes will lead to a potential outcome. Moreover, Obermeyer *et al.*, (2019) [7] discovered that a racial disparity exists in algorithm usage concerning hospitals. For example, health providers that utilize a “High-risk management system” that placed patients under a high-risk category led to many not receiving adequate medical treatments. In addition, the overall high healthcare cost saved

medical facilities millions of dollars. To further illustrate this point, research reports revealed that certain computer engineers have built algorithms predicting a person's future healthcare cost and this has led to many African American patients not receiving adequate treatment in comparison to white patients (p. 447). This disparity has meant some hospitals/medical facilities cared more about saving money than the lives of many African American patients.

Tate (1995) [8] stated that "the use of mathematics and statistics in our society would eventually be linked to one dominant group taking advantage over another group" (p. 3). Many hospitals using algorithm programs became proficient in predicting the illnesses of sick patients and began to target certain minority groups due to their illnesses. Rainie et al., (2017) [9] discussed seven themes concerning algorithms that may link this disparity through themes. First, algorithms will continue to spread everywhere. Secondly, algorithms will push things at a faster pace. Thirdly, algorithms are based on human factors. Fourth, algorithms are biased in organized systems. Fifth, algorithmic categorizations deepen divides and continue to compete with other entities. Six, algorithms will help raise unemployment. Lastly, algorithms will damage various forms of literacy and transparency in the lives of many students. One threat to African American students as it relates to education is that "algorithms will kill the competitive nature and decrease their academic striving for success" (Rainie et al., 2017) [9]. In contrast, many African American male students who were academically successful in the classroom were partly due to traditional mathematics instruction.

Tate (1995) [10] described traditional mathematics instruction as a technique in education that attempts to "solve math problems based on a classroom lecture and then producing a correct answer to a narrowly defined problem" (Tate, 1995, p. 167) [10]. Both traditional math instructions and new math have guided African American male students into learning through two opposing viewpoints. For example, during the 1980s many African American students performed academically better under traditional math instruction in comparison to new math. The National Commission on Excellence in Education (1983) [11] released A report called "Nation at Risk" which revealed that African American male students' academic standing was higher under traditional math instruction in comparison.

Tougher academics like traditional mathematics increased the incentive and motivation for African American students to show their talents in solving math problems. In contrast, when Common Core or new math were taught in the classroom results were illustrated on report cards. One explanation for poor grades by African American students was due to poor problem-solving skills and learning difficulties. Meltzer *et al.*, [12] explained that some low-achieving students had difficulties with story problems due to steps of reading, understanding, and choosing a strategy simultaneously in applying an answer to that problem.

Wilburne *et al.*, (2017) [13] also mentioned that one part of the Common

Core Standards for Mathematical Practices was getting students not only to persevere through a math problem but also getting students to improve their ability to become critical assessors of their work (p. 48). Thus, one goal of Common Core and new math is for students to continue to seek mastery goals and not performance-oriented goals. According to Wilburne *et al.*, (2017) [13], the use of performance-oriented goals is critical for students seeking value in the learning process (p. 48). Many students under this model desire rewards for their work or be motivated by extrinsic factors.

For example, Bleiberg (2021) [14] looked at data from (CC) and the (NAEP) and discovered that African American students performed poorly with (CC) from the following states. For example, in states like Missouri, 89 percent of African American students performed poorly in math computations, in the State of Georgia 86 percent, and in the state of South Carolina 90 percent were not literate in completing math problems, and in the District of Columbia, 87 percent of African American students were not literate in mathematics. Within the United States, American students were ranked 38th globally in 2021 in contrast, however, international students in China were ranked number one.

Ogbonna Ohuche (1978) [15] reflects on Nigeria, Africa's education curriculum and its changes from the 1950s through the 1970's stated that "both new math and traditional math concepts" have some similarities and differences. For example, new math concepts moved away from "rote memorization," established "math strategies" and attempted to improve student outcomes by teaching practices aligned with Common Core (p. 279).

However, new math has been disappointing to many African American male students because of its confusing concepts. In the Des Moines public school system, for example, "only 18 percent of African American students attending the 11th grade were proficient in math in the spring of 2022" (Hernandez, 2022, p. 1) [16]. One point about data from public schools across the United States is that the new math curriculum is not going to be removed from the classroom. Despite poor performances displayed by African American male students and others, school administrators have not removed the new math curriculum from the classroom. One reason why new math has not been removed is an ideological belief displayed by school administrators and politicians.

For example, according to Vevea (2023) [17], Chicago's Mayor Brandon Johnson is a believer in the new math concept. When asked a question about new math and how "politics of education and the conflicts between his philosophy and the requirements of the education system?" Chicago Mayor Johnson and former teacher responded by stating that

To be frank with you, I didn't issue a lot of homework for students. That was my way of rebelling against the structure. I don't think so.

I ever gave a kid an "F", I don't know how a student sits in front of you and fails. I know some professors may find that slightly troubling.

According to Johnson *et al.*, (2006) [18], low achievement levels displayed by

some African American students may be partially attributed to the type of curriculum and instructions that this group of minorities received in the classroom, and that has been new math instructions.

## 2. Implications

New math is not just a curriculum that has been implemented into the classroom, but new math has been shaping how students think about their approach to dealing with any mathematical problems. Algorithms, which extend our thinking systems and create a new way of thinking, work the same way. Velez (2023) [17] stated that new math was designed to give students deeper understanding of math concepts, so that students will comprehend how math problems are solved and why. Moreover, new math guides students in how they may apply different viewpoints to one situation. Students in a global market must be able to function in a way that they possess many different perspectives skills such as flexibility to many viewpoints and must incorporate skills that are well-rounded, reflective, and constructivist. Common core (CC) or new math to some degree represents an ideological viewpoint that teaches students to figure out a math problem from multiple perspectives.

In contrast, Gonzalez *et al.*, (2020) [19] emphasized that many African American male students learn best from instruction mathematics from a “culturally responsive teaching viewpoint. A culturally responsive teaching format embraces a cultural, social, and historical experience in the classroom that greatly improves the African American male student’s self-image of themselves” (p. 463). Improving self-awareness through cultural roots has helped many students of color become more confident in their academic abilities and be successful in the classroom. On the other hand, algorithms and new math have aided many African American students in becoming less successful in computing math problems and receiving the best healthcare treatments.

Ladson-Billings’s (1997) [20] viewpoint in the argument of African American students has been partially attributed to the school mathematics curriculum, assessment, and pedagogy all being closely aligned to “the cultural expression of the white middle class” (p. 700). In that, mathematics teaching and the white middle class, both embraced the belief systems of abstraction, rationality, consensus, and efficient thinking in their daily lives (p. 699). New math supports the methodology of challenging the existing rules of traditional mathematics and how prior knowledge and experiences may support or come into conflict with school mathematics. Most school curricula of today have adopted the National Council Teacher of Mathematics (NCTM) standard.

Johnson (2006) [18] stated that the NCTM methodology was established by educators and is a curriculum that most white middle-class students have experienced in the classroom. In contrast, Lubienski (2001) [21] discovered that many African American students in urban school districts were not taught math under the umbrella of (NCTM) standards, but rather on teaching instructions

based on repetition, rote memorization, drill right-answer thinking, and predictability (Ladson-Billings, 1997, p. 699) [20].

### 3. Conclusion

Chander's (2016) [22] assessment of "algorithm" utilizes many different descriptions throughout the study he conducted in describing Algorithmic functions. Chander (2016) [22] stated, "The problem faced by African Americans is likely to lie in the ways that "algorithms replicate real-world discrimination through their statistical methodologies and this point has caused many problems" (p. 1039). Former President Obama suggested that to combat racism and biases within a society of African Americans, we must create technologies to support practices that alleviate all forms of racism and biases. However, technology, new math, and algorithms have done the exact opposite and that is causing more harm to African Americans in ways that may not be apparent to other ethnic groups.

### Conflicts of Interest

The author declares no conflicts of interest.

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