



Gifted and Talented Services in Mathematics: Expanding Equitable Intellectual Access

In this position statement, the California Association for the Gifted (CAG) analyzes the research basis for gifted and talented education services in mathematics. We examine the suggestions proposed in the 2021 Mathematics Framework draft and the impact this document will have on racial and socioeconomic inequity, classroom practice, and policy in California. We conclude with recommendations for educators, policymakers, and advocates for gifted and talented services in mathematics to expand equitable intellectual access.

Background

The California Department of Education (CDE), Instructional Quality Commission, and State Board of Education are engaging in a revision process of the Mathematics Framework for California Public Schools. The first revision of the [Mathematics Framework](#) has been released and is [accepting public comment via Email](#).

In 2021, a statement made in 1980 still holds true today. In *An Agenda for Action*, it was stated, “the student most neglected, in terms of realizing full potential, is the gifted student of mathematics. Outstanding mathematical ability is a precious societal resource, sorely needed to maintain leadership in a technological world” (NCTM, 1980). In 2016, the National Council of Teachers of Mathematics (NCTM) reaffirmed this perspective by stating, “Students with exceptional mathematical promise must be engaged in enriching learning opportunities during and outside the school day to allow them to pursue their interests, develop their talent, and maintain their passion for mathematics. Such opportunities must be open to a wide range of students who express a higher degree of interest in mathematics, not just to those who are identified through traditional assessment instruments” (NCTM, 2017). All students benefit when there are opportunities to explore challenging mathematical topics in-depth and to build connections between mathematical concepts and relationships (Gavin, Casa, Adelson, et al., 2009).

The draft Mathematics Framework challenges the California Association for the Gifted’s belief that access to a high-quality, standards-aligned mathematics curriculum should be individualized and available to students based on their mathematical learning needs. Foundational to this belief is the incorporation of differentiated learning experiences that are individualized based on a student’s readiness, interests, and domain-specific abilities in mathematics (Tomlinson, 2014). Furthermore, the draft reinforces myths about gifted math students (Sheffield, 2017) and the reality that racial inequities in STEM further contribute to underrepresentation in STEM fields (Collins, 2018; Wright, Ford, Young, 2017). For some students who are ready to move beyond the grade level curriculum topics, limiting their opportunity to explore advanced mathematical topics is unjust and delays or diverts their intellectual growth.



A Systemic Impact on Racial and Socioeconomic Inequity

The most damaging forms of racism and oppression are propagated through policies, systems, and institutions (Kendi, 2019). The failure of the California public education system to provide access to an advanced mathematics curriculum that is reinforced by gifted and talented services systematically enhances the excellence gap and reinforces disparities with students who are underrepresented, underserved, and are from varying cultural, racial, ethnic, linguistic, and socioeconomic backgrounds (Ford, 2013; McGee, 2020; Plucker, Glynn, Healy, et al., 2018; Wright, Ford, Young, 2017). California is one of two states in the nation that has no mandate or funding to support identification and services for gifted and talented learners (Gentry, Gray, Whiting, et al., 2019). As a result, data from the Office of Civil Rights has revealed that American Indian, Alaskan Native, Black, Latinx, Native Hawaiian, and Pacific Islander students are under-identified in California, and therefore, not receiving gifted and talented services responsive to their intellectual needs in mathematics (Gentry, Gray, Whiting, et al., 2019; Wright, Ford, Young, 2017). This equates to 63-74% of Black students, 59-72% of Native Hawaiian and Pacific Islander, 53-66% of Latinx, and 48-63% of American Indian or Alaskan Native missing from gifted and talented services (Gentry, Gray, Whiting, et al., 2019). Los Angeles Unified School District has responded to this by adopting equitable identification practices and has around 60,000 diverse students identified as gifted and talented.

The lack of advanced curriculum and talent development services in mathematics will further exacerbate the excellence gap in California and fails our advanced learners, with the greatest consequences for our students in urban, rural, and Title I schools and for our American Indian, Alaskan Native, Black, Latinx, Native Hawaiian, and Pacific Islander students. To directly address this systemic issue, California must address this issue by directly mandating through policy equitable access to gifted and talented services, which includes:

- Procedures used in the identification process are free from bias, non-discriminatory, and inclusive of students who have been historically underrepresented, underserved, and those within varying cultural, racial, ethnic, linguistic, and socioeconomic groups.
- Criteria include multiple pathways of identification that consist of mixed methods, qualitative, or quantitative data. These data may include characteristics surveys, portfolios, interviews, standardized test data, cognitive test data, student records, or a performance.
- Identification types include:
 - Intellectual Ability
 - High Achievement
 - Specific Academic Ability (e.g., Mathematics)
 - Creative Ability
 - Leadership Ability
 - Visual or Performing Arts Talent



- Each school site should establish local group norms that ensure that each statistically significant subgroup has access to gifted and talented services (Peters, Rambo-Hernandez, Makel, et al., 2018). These data are also analyzed by the district office.
- Each school site should monitor disaggregated data for each statistically significant subgroup with district-wide analysis performed at the central office.

Redefining Gifted and Talented Services in Mathematics

The California Association for the Gifted seeks to expand equitable intellectual access to find and develop talent in mathematics. Equitable intellectual access for talent development in mathematics is inclusive of the following student groups:

- Opportunities for those who are identified as gifted in mathematics based on their intellectual learning needs perform—or have the capability to perform—at higher levels compared to others of the same age, experience, and environment in one or more mathematical domains (NAGC, 2018).
- Opportunities for those who demonstrate advanced levels of talent or potential as demonstrated by their ability to make conceptual connections in mathematics, but may not be formally identified as gifted. These students demonstrate outstanding talent, perform or show the potential for performing at remarkably high levels of accomplishment when compared with others of their age, experience, or environment (NAGC, 2018).
- Opportunities for those who communicate an interest in participating in advanced mathematics
- Opportunities for those who have been historically underserved and underrepresented in the field of mathematics or gifted and talented services

All of these students require modification(s) to their educational experience(s) to learn and realize their potential (NAGC, 2018). The menu of talent development opportunities must be consistently available as push-in services to grade levels K-12 during regular school hours. Talent development should be accessible at every school site, regardless of the racial, ethnic, linguistic, or socioeconomic demographics.

Identification

The purpose of identifying a student as gifted in mathematics is to provide them with services that acknowledge and respond to their intellectual development and learning needs in a specific mathematical domain (e.g., Counting & Cardinality, Operations & Algebraic Thinking, Number & Operations in Base Ten or Fractions, Measurement & Data, Geometry, Ratios & Proportional Relationships, The Number System, Expressions & Equations, Functions, Statistics & Probability). Therefore, identification measures for mathematics need to evaluate the degree of understanding within a specific domain of mathematics. Identification measures need to analyze the degree to which the student has a conceptual understanding and problem-solving capabilities within the domain(s) as described by the [Standards for Mathematical Practices](#), whereas traditional



identification measures may only examine procedural and skill-based understanding based on a cut-off score that is not specific to a domain of mathematics (Lohman, Gambrell, & Lakin, 2008). Identification occurs in grades PK-12 and may analyze an individual for talent in mathematics at multiple points if they are not initially identified. Once identified as gifted in mathematics, ongoing monitoring occurs at the domain-level to target areas of mastery and areas that need further conceptual development or reinforcement. Identification also supports students who are demonstrating advanced talent and the ability to make continuous progress through experiences that place them on the edge of understanding, allow them to make mistakes, and encounter productive struggles to prepare them to be STEM leaders in the future. The California Association for the Gifted acknowledges that every student is a mathematician and encourages pedagogy that promotes talent development so every student can recognize their mathematical potential.

Tracking

The California Association for the Gifted denounces tracking. We acknowledge how tracking has marginalized and systematically oppressed groups (Oakes, 2005). The purpose of identifying gifted and talented students is not intended to be a tracking strategy, however, the California Association for the Gifted does acknowledge the fact that communities have used gifted and talented identification as a tool of segregation and systemic intellectual and academic oppression.

Identification is intended to match the learning need with services that are responsive and accessible in the same way other learners receive services for their learning needs. Grouping strategies for gifted and talented learners, individuals who demonstrate talent, and students who are interested in advanced mathematics are intended to be flexible and dynamic (Steenbergen-Hu, Makel, & Olszewski-Kubilius, 2016). Students may be grouped as a means to provide differentiated learning experiences based on their readiness, interest, or abilities (Tomlinson, 2014). Grouping is never intended to be fixed and is not intended to serve as a mechanism for tracking. Failure to provide historically underrepresented groups access to gifted services and advanced mathematics opportunities will further create a racial division in STEM fields (Oakes, 1990).

Acceleration

The California Association for the Gifted believes that accelerated learning experiences should be individualized based on regular pre-assessment, formative, and summative assessment data (Assouline & Lupkowski-Shoplik, 2011). The accelerated learning experience is personalized to encourage a deeper conceptual understanding, enhance real-world problem-solving capabilities, and increase generalizability and transferability within and across mathematical domains. Acceleration is responsive to the learning needs associated with exceptional talent as evidenced by a conceptual depth of understanding. As math experts have correctly acknowledged, acceleration does not equate to providing a group of students with more procedural, skill-based, and shallower



experience at a faster rate. The California Department of Education suggests standards for gifted and talented education services that include access to curricular experiences that incorporate depth, complexity, novelty, and acceleration (The California Department of Education, 2005).

Classroom and Policy Implications for California

When students who display talent in mathematics are provided services at a young age, the transfer of these talents extends into their adulthood (Lubinski & Benbow, 2006; McGee, 2020). California must adopt a policy that directly addresses the excellence gap in California to provide gifted education services for students, with an emphasis on access for urban, rural, and Title I schools and our American Indian, Alaskan Native, Black, Latinx, Native Hawaiian, and Pacific Islander students. Additionally, mathematics should be required for 40 credits, or four years, in high school. By offering advanced mathematics reinforced by gifted and talented services, California ensures that its next generation of diverse, innovative producers are equipped with the conceptual foundation, critical thinking, and real-world problem-solving to effectively contribute as dynamic members of the workforce and as individuals who can address problems critical to the future of science, engineering, technology, and mathematics.

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