

Catering for the Mathematically Gifted

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“I like complicated problems because I love the challenge. I love being challenged by mathematics... most times when I have a problem I am able to deal with it and I never get anything wrong and I don’t like that because I want to be challenged I want to be provoked by the problem...I want it to like tickle me like its not simple like as soon as you look at it you don’t like the answer doesn’t come to mind at once.”

These are the sentiments of Naobi (pseudonym), a Form 1 student at a high-achieving all girls’ school in Trinidad. Naobi placed among the first hundred students in the Secondary Entrance Assessment (SEA) examination and attends the school of her choice. She is highly motivated, articulate, and loves mathematics. However, while she is doing well in school, she, like many others in secondary schools around the world, belongs to an “at risk” population—the gifted and talented mathematics student. Indeed, nearly 20 years ago, the National Council of Teachers of Mathematics (NCTM) in the United States (US) stated that students like Naobi were among the most neglected in terms of realising their full (mathematical) potential, and that to neglect to develop such a resource would endanger the US’s capacity to maintain leadership in an increasingly technological world. Sadly, today, the situation in classrooms around the world is not much different as teachers struggle to achieve the noble goals of “education for all,” often leaving mathematically gifted and talented students to fend for themselves, since it is believed that they will learn the material anyway.

Mathematically gifted and talented students are typically misunderstood, bored, and frustrated in the regular classroom. This is because they characteristically develop a deep conceptual understanding of mathematics at a far earlier age than their peers, sometimes by as much as ten years. This is reflected in several research studies where students repeatedly stress their frustration at going over material that they had learnt “ages ago.” Consequently, some mathematically talented students may underachieve as they become “turned off” by work that fails to offer them a meaningful level of challenge. Others may act out, becoming disruptive and aggressive, while, at the other extreme, exaggerated conformity and extreme passivity have also been observed.

As with all learners, though, what mathematically gifted and talented students want and need are adequate and appropriate levels of intellectual stimulation; cognitively (and physically) challenging and demanding activities; encouragement from their social networks; high-quality and relevant feedback, aimed at improvement, from their instructor; and supportive cultures in and out of school. This is as much a challenge as providing learning opportunities for students with learning needs at the other end of the spectrum. Indeed, failing to provide adequately for any student is a serious injustice that societies must actively work at reducing and eliminating from their classrooms.

There are many strategies that classroom teachers can experiment with if they have talented students working in a heterogeneous group. These include accelerating the curriculum for these learners, enriching the curriculum by including activities outside the curriculum, getting students involved in mathematical competitions such as math Olympiads or math circles, helping them to

gain access to male and female math mentors in society (and globally through technological means), and providing differentiated and authentic assignments that allow students to demonstrate and extend their learning and abilities at a high level. Teachers, being more experienced, have a lot to teach the gifted and talented student. This instruction becomes less about content knowledge and more about how to evaluate their own work critically, and how to access resources appropriate to their level. In addition, because gifted and talented students tend to have more positive relations with their teachers, it appears that they are much more profoundly affected by their interactions with teachers than other students.

Mathematics, as a discipline, is both revered and reviled in society. The gifted and talented mathematics student poses a challenge for teachers, schools, and individuals. They belong to all groups and socio-economic backgrounds, though women and minorities tend to be under-represented at the very highest levels for a variety of reasons. We cannot continue to ignore this critical social resource. Finally, here in the Caribbean, more research needs to be done to determine the needs of our gifted populations across all domains of accomplishment. In addition, strategies and structures need to be put in place at the various levels to help them, and indeed all students, fulfil their and our collective aspirations.

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