
Accelerating Instruction in Mathematics: Grades 9-12

National High School Center

Taking advanced mathematics in high school has been found to be strongly associated with postsecondary success (Adelman, 1999). Algebra I is viewed as the “gatekeeper course,” and successful completion paves the way for students to advance to higher level mathematics coursework that will help to prepare them for post-secondary career and college opportunities (Bangser, 2008). Unfortunately, a large number of students enter high school with poor math skills (Strickland & Walters, 2009) and are not prepared to successfully complete an algebra course. Without the proper assistance, the likelihood of these students participating in a rigorous math course sequence is greatly reduced.

Accelerating instruction in math helps to address the issue by moving away from the more traditional model of remediation that, in most cases, keeps students on low academic tracks that some believe contribute to their persistent low achievement. The underlying premise of accelerated instruction is that all students should have the opportunity to enroll in rigorous mathematics coursework. Therefore, instead of slowing down the instructional pace for low-achieving students, instruction is accelerated to help these students overcome prior poor educational preparation and “catch up.” With accelerated instruction, students learn foundational math skills as well as higher level mathematics content. As a result, they remain on-track to take more advanced mathematics courses.

Accelerating mathematics instruction is especially important to provide foundational skills necessary for mastery of other content areas. Within the context of accelerating instruction, educators must consider the quality and nature of instruction provided. Accelerated instruction must be based on a well-designed curriculum taught by qualified instructors. Implementing this strategy also calls for smaller classes, differentiation of instruction, and the use of multiple instructional modalities such as computer-based programs, hands-on activities, group and independent activities to better address diverse student needs (Portz & Gaudet, 2001).

Although the research evidence on the needs of students who enter high school with inadequate mathematics skills is minimal, schools can employ several promising strategies to accelerate instruction. These include the following:

Double-blocked class schedules: With a double-blocked class schedule, classes meet daily for extended periods and can cover a year’s worth of material in one semester. This gives students the opportunity to attempt and earn more credits per year than more traditional schedules such as daily 50-minute classes or a single-blocked schedule with 80- or 90-minute classes meeting every other day (Herlihy & Quint, 2006).

Catch-up courses: Semester-long intensive “catch-up” courses that strengthen ninth-grade students’ skills in reading and mathematics appear to help students succeed in the regular curriculum, with gains in credits earned being sustained over time. These courses are designed to prepare students for more rigorous college preparatory classes such as English I and Algebra I (Herlihy & Quint, 2006).

Mathematics support pull-out programs: This involves pulling students out of their regular classes for participation in more specialized instruction tailored to their academic needs (Portz & Gaudet, 2001).

For more information on these strategies, please reference the section on “Credit Recovery Programs” in Chapter 5 of this *Handbook*.

Action Principles

For District

1. Provide guidelines on how to offer accelerated mathematics programs.
2. Provide oversight and support for instructional initiatives aimed at accelerating instruction to help ensure adherence to guidelines and effective implementation.

3. Provide criteria for assessing student skill deficits and identifying which students need accelerated instruction.
4. Provide standards and assessments for monitoring instruction and student learning.
5. Provide teachers with ongoing support for and professional development on implementing accelerated instruction.
6. Track the progress of school efforts and student achievement to help identify effective practices and establish a system of accountability.

For School

1. Use standards and assessment data to help plan and/or improve the math curriculum and ensure that it is tailored to students' needs.
2. Develop early warning systems to identify students in need of extra math instruction when they enter high school.
3. Administer a diagnostic assessment at the beginning of the school year to identify specific math skill and content weaknesses and use this information as the foundation for students' curricular and instructional planning.
4. Make teacher assignments based on the needs of students; an assessment of teacher strengths and weaknesses should guide these decisions. Teachers should have adequate mathematics content knowledge as well as the skills to work with struggling students. Provide teachers with professional development and support in issues related to curriculum and instruction (including model lesson plans and opportunities to engage with master teachers).
5. Develop guidelines to monitor and ensure the efficient use of class time, student engagement, and the use of a range of instructional strategies.

References and Resources

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