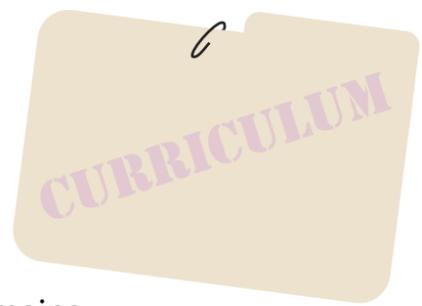


Instruction in Advanced Mathematics Classes

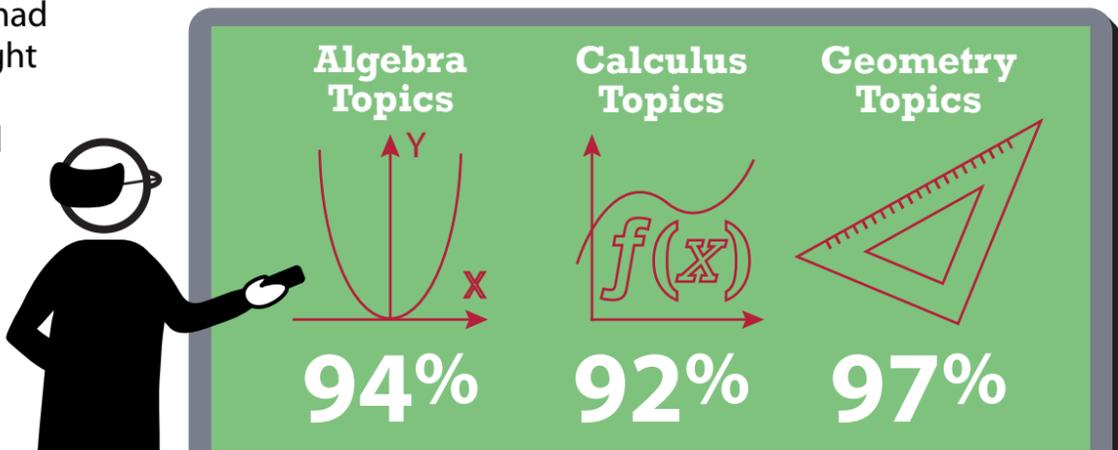
Curriculum

Covering a rigorous curriculum is key in students' opportunity to learn.

Eight of the nine countries participating in TIMSS Advanced had a national curriculum, with the United States being the exception. All but two (Sweden and the United States) had a "high stakes" test for students nearing the completion of secondary school.



There was variation in topic coverage within content domains. However, according to their teachers, on average, most Advanced Mathematics students had been taught the TIMSS Advanced topics.

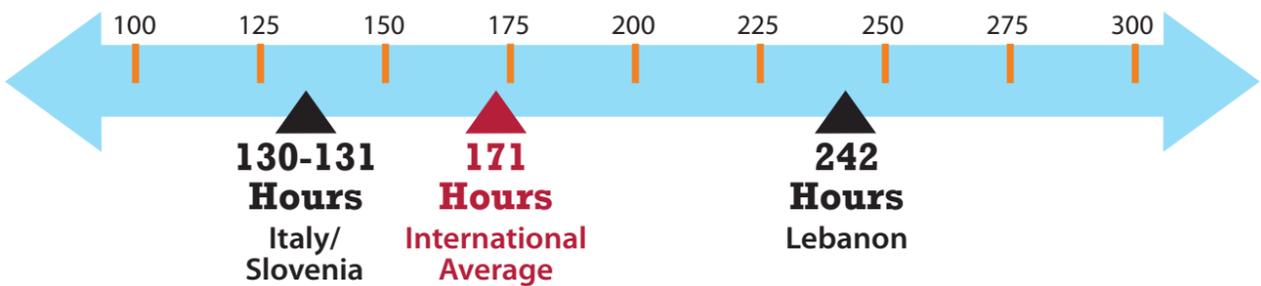


Instructional Time

Instructional time remains a crucial resource in considering students' opportunity to learn in their final year, even though there are many factors that influence the effectiveness of an educational system.

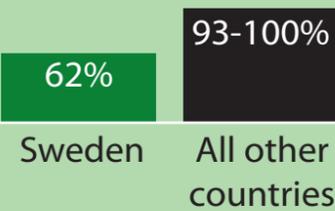


There was a considerable range in the yearly number of instructional hours in advanced mathematics.



Students also studied outside of school:

Almost all students were assigned homework except in Sweden:

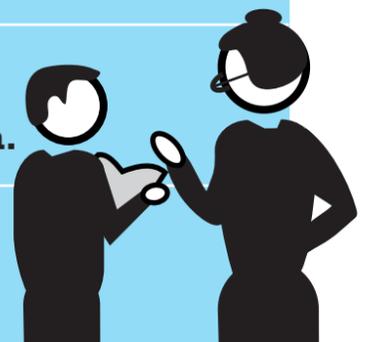


Large percentages of Advanced Mathematics students reported attending extra tutoring outside of school to improve their achievement.

3/5 attended tutoring in Portugal and the Russian Federation.

1/3 attended tutoring in France, Italy, and Slovenia.

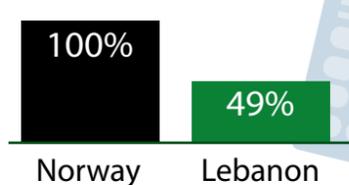
On average, students attending extra tutoring had lower achievement.



Technology

There is a continuing debate about the role of technology in education, and more particularly in mathematics classes.

Across the TIMSS Advanced countries there was a wide range in access to digital devices to use in advanced mathematics lessons, with 78% of students on average having digital devices available.



Teachers have students use their digital devices primarily to draw graphs of functions (68%) and solve equations (63%).

Students used the Internet for their TIMSS Advanced school work primarily to:

Find information about mathematics concepts or solve problems

Access course materials and do homework



68-70%

50-54%