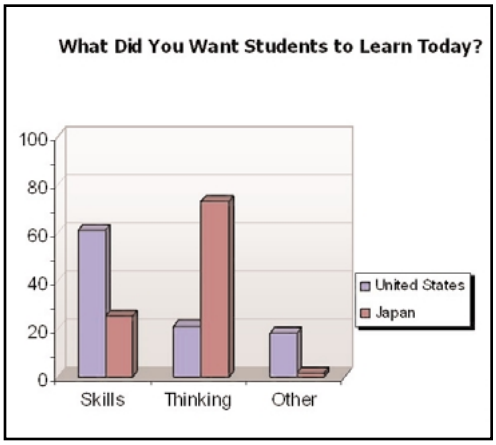
The Classroom

Classwork

The brief and finite amount of time teachers have with their students makes use of that time crucial. In high school or middle school, students may spend only 45 or 50 minutes per day in a math or science class. How are teachers making use of that time? What is being asked of students in class? What do students do in class?

- What teachers try to accomplish during instruction varies internationally. When asked, "What was the main thing you wanted students to learn from today's lesson?"[1]
  - Sixty-one percent of U.S. eighth-grade math teachers responded "skills," meaning they wanted students to learn how to solve specific kinds of problems or to use standard formulas.
  - Twenty-one percent answered "thinking," meaning their lesson emphasized students' exploration, development, or comprehension of mathematical issues or concepts.
  - Responses from Japanese teachers, whose students score near the top in most international mathematic achievement comparisons, were exactly reversed. Seventy-three percent said "thinking," while 25 percent said "skills."



- Some 72 percent of U.S. fourth-grade math teachers and 59 percent of eighth-grade math teachers report they have their students practice computational skills during most or all lessons.[2]

  In Ohio, the comparable percentages are higher: 82 percent in third and fourth grade and 74 percent in seventh and eighth grade. Even in Ohio's 12th-grade classes, computational practice occurs in most or all classes, according to 58 percent percent of the math teachers.[3]

- About two-thirds of U.S. teachers ask students to complete routine exercises from workbook pages or worksheets every day.[4]

- Most lessons divide into periods of classwork or seatwork. Classwork is the time teachers spend working with all of the students, usually orchestrating discussion or lecturing. Seatwork refers to the time when students work individually or in small groups.

- In the U.S., the sequence of activities and balance between classwork and seatwork is very much the same from classroom to classroom.[5]
- In the U.S., as in many other countries, teachers spend more time on classwork than seatwork.[6]
- Japanese teachers keep periods of classwork shorter and use more frequent periods of seatwork.[7]

- Major reviews of research confirm that the factors that most influence learning are those most closely related to the student. Factors consistently cited are:[8]
  - *Classroom management:* Teachers using strategies that maintain active participation by all students.
  - *Student/teacher interaction:* Students responding positively to questions from other students and from the teacher.
  - *Classroom climate:* Cohesiveness of class members, sharing common interests, values, and goals.
  - *Peer group influence:* Level of peers' academic aspirations and engagement.

In the short time each day that math and science teachers have with their students, use of every minute must be examined and evaluated. Are students simply filling out workbook pages or watching films or videos? Is the teacher spending most of the time lecturing, while (it is hoped) students take notes? Are students actively engaged in the process of learning or is their focus elsewhere?

As teachers share more and more of those minutes with technology, more attention must be paid to classroom activities and the distribution of time to each. Spending time in diligent drilling and practice holds much less value than developing skills and knowledge that can be extended beyond the narrow context in which they are learned.[9] Knowing how to solve a math problem in the classroom may not transfer to solving math-related problems outside the classroom.

Endnotes

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3. NCREL analysis of OMSC-sponsored teacher survey, fall 1999.
4. R. Henke, X. Chen, and D. Goldman, *What Happens in Classrooms? Instructional Practices in Elementary and Secondary Schools, 1994-95,* U.S. Department of Education, National Center for Education Statistics, Washington, DC, 1999.
5. S. Olson, "Candid Camera," *Editorial Projects in Education,* 10, pp. 28-32, 1999.
6. *Attaining Excellence: TIMSS as a Starting Point to Examine Teaching, Moderators' Guide to 8th-Grade Mathematics Lessons: United States, Japan, and Germany,* an Eisenhower National Clearinghouse project, September 1997.
7. Ibid.
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9. J. Bransford, A. Brown, R Cocking, *How People Learn: Brain, Mind, Experience, and School,* Washington, DC, National Academy Press, 1999.

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