

expect that practices used in Asian societies could possibly be relevant for the American context, where diversity is the rule in race, ethnicity, language, and social class?

What impedes teaching is the uneven preparation of children for the academic tasks that must be accomplished. It is diversity in children's educational backgrounds, not in their social and cultural backgrounds, that poses the greatest problems in teaching. Although the United States is culturally more diverse than Japan or China, we have found no more diversity at the classroom level in the educational level of American than of Asian students. The key factor is that, in the United States, educational and cultural diversity are positively related, leading some persons to the inappropriate conclusion that it is ethnic and cultural diversity, rather than educational diversity, that leads to the difficulties faced by American teachers.

It is true, for example, that there is greater variability in mathematics achievement among American than among Japanese children, but this does not mean that the differences are evident in any particular classroom. Variability in the United States exists to a large extent across neighborhoods and schools (rather than within them). Within individual classrooms, the variability in levels of academic achievement differs little between the United States and Japan, Taiwan, or China. It is wrong to argue that diversity within classrooms is an American problem. Teachers everywhere must deal with students who vary in their knowledge and motivation.

Tracking does not exist in Asian elementary schools. Children are never separated into different classrooms according to their presumed levels of intellectual ability. This egalitarian philosophy carries over to organization within the classroom. Children are not separated into reading groups according to their ability; there is no division of the class into groups differentiated by the rate at which they proceed through their mathematics books. No children leave the classroom for special classes, such as those designed for children who have been diagnosed as having learning disabilities.

How do teachers in Asian classrooms handle diversity in students' knowledge and skills? For one thing, they typically use a variety of approaches in their teaching, allowing students who may not understand one approach the opportunity to experience other approaches to presenting the material. Periods of recitation are alternated with periods in which children work for short periods on practice problems. Explanations by the teacher are interspersed with periods in which children work with concrete materials or struggle to come up with their own solutions to problems. There is continuous change from one

mode of presentation, one type of representation, and one type of teaching method to another.

Asian teaching practices thrive in the face of diversity, and some practices can depend on diversity for their effectiveness. Asking students to suggest alternative solutions to a problem, for example, works best when students have had experience in generating a variety of solutions. Incorrect solutions, which are typically dismissed by the American teacher, become topics for discussion in Asian classrooms, and all students can learn from this discussion. Thus, while American schools attempt to solve the problems of diversity by segregating children into different groups or different classrooms, and by spending large amounts of regular class time working with individual students, Asian teachers believe that the only way they can cope with the problem is by devising teaching techniques that accommodate the different interests and backgrounds of the children in their classrooms.

Asian teachers also exploit the fact that the same instruction can affect different students in different ways, something that may be overlooked by American teachers. In this sense, Asian teachers subscribe to what would be considered in the West to be a "constructivist" view of learning. According to this view, knowledge is regarded as something that must be constructed by the child rather than as a set of facts and skills that can be imparted by the teacher. Because children are engaged in their own construction of knowledge, some of the major tasks for the teacher are to pose provocative questions, to allow adequate time for reflection, and to vary teaching techniques so that they are responsive to differences in students' prior experience. Through such practices, Asian teachers are able to accommodate individual differences in learning, even though instruction is not tailored to each student.

USE OF REAL-WORLD PROBLEMS AND OBJECTS

Elementary school mathematics is often defined in terms of mathematical symbols and their manipulation; for example, children must learn the place-value system of numeration and the operations for manipulating numerals to add, subtract, multiply, and divide. In addition, children must be able to apply these symbols and operations to solving problems. In order to accomplish these goals, teachers rely primarily on two powerful tools for representing mathematics: language and the manipulation of concrete objects. How effectively teachers use these forms of representation plays a critical role in determining how well children will understand mathematics.