Multicultural Teaching Tips

Practical suggestions for incorporating the diverse history of science into the classroom

MULTICULTURAL EDUCATION IS a meaningful opportunity for students to achieve their maximum potential. It is clear that in any society or classroom cultural differences exist among all students. In reality, these differences are a nation’s strongest assets. Multicultural education recognizes all students’ individuality and welcomes the contributions of all groups in a society. A modest attempt to explain the benefits of multicultural education and some practical suggestions for implementing it follow.

Diversity brings a wealth of resources to the classroom in the form of opportunities for cross-cultural interactions among students. As teachers, we must promote mutual respect and trust among students while we help students counteract bias and enable them to distinguish myth from reality. For instance, we must be careful not to lump together all Asian Americans or Native Americans in one group. There are distinct variations and unique cultural features within these populations as in all populations. Therefore, each student should feel proud of his or her cultural heritage and should know that his or her ethnic group is important.

The 1991 NSTA Position Statement on Multicultural Education encourages teachers to present top-quality science instruction that helps all students experience success. Moreover, the position statement stresses the selection of curriculum materials and instructional strategies that reflect diversity. Finally, the position statement recommends that students from diverse cultures should learn about career opportunities in science, engineering, and technology. In a nutshell, educators must ensure that the contributions of minority cultures are not overlooked in the process of instruction.

Teachers must encourage the majority culture to recognize that the contributions of minority cultures are essential for the well-being of a democratic society. Learning about different cultures should start at a very young age. Teachers should stress to students that recognizing and accepting cultural differences in a classroom or in a society are essential for general harmony and peaceful coexistence.

To promote science literacy, a teacher must be prepared to reach out to all students. Teachers need to pay attention to cultural differences in their classroom and use these differences effectively in the teaching process. Students should learn that science was not solely an invention of Europeans. Science was developed throughout the ages with the contributions of many people around the world. For instance, in ancient Egypt and Mesopotamia, copper was extracted from ores, glass was made, fabrics were dyed with natural colors, and distillation was used to produce perfumes.

In the past 100 years, scientists from all over the world have helped advance scientific knowledge. Teachers should discuss the contributions of scientists from diverse backgrounds as well as from both genders. It is well established that students need role models, and these scientists can serve as role models. Figure 1 lists some scientists from traditionally underrepresented groups.

We live in an interdependent world that is com-
monly referred to as a global village. There are many problems in this global village that need the attention of scientists; no single group can solve all of these problems. Students who may aspire to become scientists should be alerted to world problems. For example, students should discuss the issues of pollution, famine, overpopulation, and disease from a global perspective. Solutions to these problems should be discussed in terms of global impacts, resources, and limitations.

In American schools, cultural diversity has become a reality. Actually, it was inevitable because of the continuous influx of immigrants from abroad and the mobility of citizens within the country. Many challenges come with multiculturalism, such as multiple languages and gender issues. Teachers need to be aware that language barriers may cause some students to require more time on in-class tasks, assignments, and laboratory activities. Teachers must give equal attention and opportunity to male and female students. According to one researcher, “girls are less likely than boys to participate in class discussions” (Banks, 1993, 3–28).

Teachers’ attitudes and interests play important roles in using diversity among student populations to its fullest potential, promoting the notion that humanity has benefited from diversity. To meet the needs of all students, maximize learning, and promote a multicultural atmosphere in the classroom, science teachers should consider the suggestions that follow.
### African American Scientists

- **Benjamin Banneker**—Mathematician and astronomer.
- **George Washington Carver**—Chemurgist; known for his work with peanuts, improved crop production.
- **Benjamin Carson**—Pediatric neurosurgeon at Johns Hopkins University.
- **Charles Drew**—Researcher in blood preservation; work led to founding of blood banks.
- **Shirley Jackson**—Physicist; first black woman to earn doctorate degree from the Massachusetts Institute of Technology.
- **Percy Julian**—Chemist; developed cortisone and a drug to treat glaucoma.
- **Ernest Just**—Biologist; completed major work in the study of cells and fertilization.
- **Myra Adele Logan**—First African American woman elected to the American College of Surgeons; analyzed, refined X-ray techniques used to detect breast tumors in women.
- **Walter Massey**—Physicist and educator; professor of physics.
- **Elijah McCoy**—Mechanical engineer; patented more than 50 inventions.

### Female Scientists

- **Irene Curie**—Nobel Prize winner; synthesized artificial radioactive elements.
- **Marie Curie**—Polish chemist and physicist in France, two-time Nobel Prize recipient; discovered radioactive radioactive elements such as polonium and radium in collaboration with her husband, Pierre Curie.
- **Amelia Earhart**—Pilot; pioneered long-distance flight.
- **Jane Goodall**—Zoologist; studied chimpanzees.
- **Elma Gonzalez**—Biologist; studies membranes and other small cell structures.
- **Mary Leakey**—Anthropologist, pieced together bone fragments to reveal human ancestry.
- **Barbara McClintock**—Geneticist, Nobel Prize winner; pioneered the idea of jumping genes.

### Other Minority Scientists

- **Alonzo Atencio**—Physician, researcher; studies how oxygen is transported to tissues.
- **Paul Chu**—Physicist; discovered a superconducting material in 1986.
- **John Hernandez**—Physicist at the University of North Carolina at Chapel Hill; specializes in chemical physics.
- **John B. Herrington**—Lieutenant Commander, U.S. Navy, Astronaut Candidate, NASA; Chickasaw Indian.
- **Roberto Merlin**—Physicist, native of Argentina; studies interaction of light with semiconductors.
- **Clifton Poodry**—Biologist; grew up on the Tonawanda Seneca Indian Reservation in western New York, studies developmental genetics in fruit flies at the University of California.
- **Eloy Rodrigues**—Chemist; studies chemicals in plants; expert on rubber plants.
- **Clifford Schumacher**—Theoretical physicist, Chippewa/Sioux Indian.
- **Chien-Shiung Wu**—Designed and carried out an experiment on subatomic particles.
HELPFUL HINTS

There are a number of things teachers can do to successfully implement multicultural education. One crucial step is to know the parents and the community resources, “especially people from various ethnic backgrounds who have science careers or hobbies” (Tolman and Hardy, 1995, 78). An excellent way to involve the community is to establish an international/multicultural day and invite students and their families to share their cultural heritage and ways of life. Teachers should emphasize that each family is unique and each family has its own cultural identity.

For students with language barriers, hands-on and minds-on activities in which students manipulate concrete materials can aid in the development of better process skills and the attainment of higher levels of science achievement. Using concrete experiences also helps develop new vocabulary. When writing on the board, overhead transparencies, or students’ assignments, teachers should strive for legibility, especially for students whose native language is not English. Teachers can also help limited English proficiency students by having a dictionary in the student’s native language available for reference. Teachers experiencing difficulty communicating with a student’s parents should solicit the help of a community member fluent in the student’s native language. During a test or quiz, teachers should allow more time for students not yet fluent in English.

A wide range of teaching strategies should be used. Teachers should learn about students’ learning styles (hands-on, sequential, visual, auditory, group, individual, oral expressive, written expressive, or global) (Martin et al., 1994). Visual and concrete demonstrations can be helpful when making a point or teaching a concept. The cooperative learning approach can foster cooperation among students from diverse backgrounds. Teachers can set an example of cooperation by complimenting students for their diverse views, praising them for their unique skills, and exercising understanding and compassion.

These suggestions are in keeping with the National Science Education Standards, which state that assessment practices must “be reviewed for the use of stereotypes” and “identify potential bias among subgroups” (NRC, 1996). Furthermore, assessment tasks should “accommodate the needs of students with physical disabilities, learning disabilities, or limited English proficiency” and “be set in a variety of contexts, be engaging to students with different interests and experiences, and must not assume the perspective or experience of a particular gender, racial, or ethnic group” (NRC, 1996, 85).

EDUCATING EVERYONE

It is an established fact that our society is composed of distinct cultures. At present, many classrooms represent a mini United Nations where students of different backgrounds learn under the same roof. As teachers we should do all we can to help students experience success and to maximize their learning potential. We have the enormous responsibility to reach out to all students in our care. The well-being of a harmonious society depends on the successful coexistence and interdependence of its varied populations. As our society is increasingly and inevitably becoming diverse, this diversity, in essence, brings strength and poses certain challenges to our educational system. Last, it is important for educators to provide useful and productive opportunities for multicultural students to experience success in the classroom and in the larger society.

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REFERENCES


FOR FURTHER READING


MULTICULTURAL INTERNET SITE

http://www.tenet.edu/academia/multi.html Site includes links to African/African American, Asian/Asian American, Indigenous People, Latino, Native American, and General Multicultural resources.