Teaching Students with Disabilities: Applying and Learning Scientific Habits of Mind

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Teaching Students with Disabilities: Applying and Learning Scientific Habits of Mind

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Jay Hatch, associate professor of biological sciences at the University of Minnesota (UMN) and associate curator of fishes at the Bell Museum of Natural History in Minneapolis, has been a scientist for over 25 years. During his career, he has applied innovative thinking and persistence in tackling myriad scientific challenges. When Kate Jirik, a student with severe physical disabilities, enrolled in his introductory biology course, Hatch was suddenly faced with a new set of challenges.

The course involved a significant amount of lab work, and since Jirik had severe motor limitations and was legally blind, she would be unable to participate in the same way that other students did. According to Jirik, however, “I didn’t want to be included if that meant sitting on the sidelines watching science go by. I want to be an active participant in what is happening.” While pondering this dilemma, Hatch questioned the fundamental purpose of the lab. “I discovered that the basic goal was to have students understand the process of science,” says Hatch, not merely accomplish physical tasks.

With this as their guiding principle, Jirik and Hatch worked together to establish course modifications. These included not only changes that accommodated her physical limitations, such as the use of an assistant in the lab and extra time to complete worksheets, but also ones that emphasized Jirik’s intellectual strengths. “Accommodations don’t always need to overcome a weakness or inability,” emphasizes Jirik. Hatch created new ways for Jirik to show that she understood the lab concepts, and Jirik proceeded to accomplish her goal of completing the course as an active participant.

A second benefit of this approach was that other students, with or without disabilities, had alternative ways to learn and demonstrate their understanding. “About 6 percent of all undergraduate students have a disability, many of which are unreported, and the most common of these are learning disabilities,” says Sheryl Burgstahler, director of the program called DO-IT (Disabilities, Opportunities, Information, Networking, and Technology) at the University of Washington.

DO-IT’s goal is to increase college and career opportunities for students with disabilities through innovative programs and resources. An entire section of the DO-IT Web site is devoted to the needs of postsecondary educators, staff, administrators, and students (www.washington.edu/doit/Resources/postsec.html) and includes a searchable database with frequently asked questions and case studies.

Because disabilities are so widespread and wide-ranging, DO-IT encourages institutions to create learning environments that benefit a broad group of people by following the principles of “universal design.” The universal design of instruction (UDI) principles are in a brochure published on the DO-IT Web site (www.washington.edu/doit/Brochures/Academics/instruction.html).

The first principle of UDI is to create an inclusive environment. “Attitude plays a huge part of the disabled student–faculty partnership,” says Burgstahler. She encourages faculty to not immediately assume students will fail because they don’t look as if they can succeed. “I think it is important for faculty to not have preconceived negative ideas about the abilities of students with disabilities,” agrees Jirik, now a PhD student in the history of science and technology program at UMN. Jirik recognizes that there are things she simply cannot do, but “if the focus is on those things, then the possibility of a positive experience is pretty remote.”

The principles of UDI are equally relevant and important in lab and fieldwork settings, where some students with disabilities may face the most challenging environmental obstacles. Determining the intended learning outcomes before figuring out course logistics is a vital first step in the process of accommodating students with disabilities (see “Field Work Resources” at www.washington.edu/doit/Faculty/Strategies/Academic/Fieldwork/fieldwork_resources.html).

It takes time to modify courses, implement new teaching strategies, and meet individual students’ needs. And the more time spent on courses, the less time there is for research. Therefore, stresses Hatch, “institutional support is essential, especially for untenured faculty at research institutions.”

Burgstahler encourages faculty to be open-minded and give students with disabilities a chance to succeed, and to consult the students for guidance on how they can best be included in activities. “It is important for all people to take science courses, since so much of our world revolves around science and technology,” adds Jirik. “When you exclude certain groups of people, you exclude them from an important part of the world.” And who knows, the next Stephen Hawking or Geerat Vermeij may be in your class right now.

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