Preparing Technology Education Teachers to Work with Special Needs Students

Technology education programs typically rely on active, hands-on learning in order to provide students "real-world" experiences.

Cheryl E. P. Evanciew

Including students with special needs into technology education classes is no longer just encouraged; it is the law. Educational reform movements and legislation such as Section 504 of the Vocational Rehabilitation Act of 1973, The Americans with Disabilities Act (ADA) of 1990, The Carl D. Perkins Act of 1990, the Individuals with Disabilities Education Act (IDEA) of 1990, the School-to-Work Opportunities Act of 1994, and IDEA Amendments of 1997 focus on inclusion of students with special needs in regular classrooms to the maximum extent appropriate. Specifically, IDEA "establishes the right of students with disabilities to a free appropriate public education" (Wonacott, 2001, pg. 1). The 1998 Carl D. Perkins Act "requires equal access for special populations, including students with disabilities, to all vocational programs, services, and activities and prohibits discrimination based on special population status" (Wonacott, 2001, pg. 1).

Students with special needs must be provided **equal** access to technology education programs. Research suggests that students with special needs benefit from experiences that involve functional, hands-on learning, such as those experiences students in technology education programs receive (Collins, Hawkins, & Carver, 1991). Through inclusion in technology education programs, students gain basic knowledge about a variety of careers available upon completion of school. In addition, students with special needs can gain an insight into the needs and qualifications of the various careers available to them.

All too often, teacher education programs provide generic classes for all education majors that focus on students with special needs (Jones & Black, 1995). This generic focus may be too broad for technology education teachers—especially in light of the safety and liability issues associated with their classes and laboratories. According to Sarkees-Wircenski and Scott (1995), students with special needs have a better chance of success and accomplishment when they are taught using contextualized and hands-on activities, such as those associated with technology education. Therefore, all teachers need to be aware of specific legislation, issues, and accommodations associated with students with special needs.

Conceptual/Theoretical Framework

Students with special needs are better able to learn when course content is presented in a realistic, applications-based method. Research indicates that students with special needs learn more successfully when learning is "embedded in authentic contexts where students engage directly with real life objects and situations" (Rojewski & Schell, 1994, p. 241). This form of contextualized learning is referred to as situated cognition. Situated cognition theory states that whenever possible, learning should occur within a specific context and should attempt to replicate as closely as possible the practices used in that context (Brown, Collins, & Duguid, 1989; Collins, Hawkins, & Carver, 1991; Lave & Wenger, 1991). In addition, the social aspects of learning are essential from a situated cognition perspective (Lave, 1988). Resnick (1991) argued, "the social context in which cognitive activity takes place is an integral part of that activity, not just the surrounding context for it" (p. 4). This contextualized, situated, and social learning is crucial for students with special needs.

Categories of Students with Special Needs

As mentioned previously, students with special needs have been identified by various legislative acts. Specifically, the Individuals with Disabilities Act (IDEA) of 1990 identifies the following disability categories:

1. Specific learning disabilities
2. Speech or language impairment
3. Serious emotional disturbance
4. Mental retardation
5. Hearing impairments (including deafness)
6. Orthopedic impairment
7. Other health impairment
8. Visual impairment (including blindness)
9. Multiple disabilities
10. Deafness
11. Deaf-blindness

IDEA Amendments of 1997 added two additional classifications:

12. Autism
13. Traumatic brain injury (U.S. Department of Education, 1997).

It is important to understand that students with special needs do not include students who are deemed socially or academically disadvantaged.

According to IDEA 1997, a student with a disability includes the following: "The term 'child with a disability' means a child with mental retardation, hearing impairments (including deafness), speech or language impairments, visual impairments (including blindness), serious emotional disturbance (hereinafter referred to as 'emotional disturbance'), orthopedic impairments, autism, traumatic brain injury, other health impairments, or specific learning disabilities." (p. 9). In addition, IDEA 1997 defines specific learning disability as:

> A disorder in one or more of the basic psychological processes involved in understanding or in using language, spoken or written, which disorder may manifest itself in imperfect ability to listen, think, speak, read, write, spell, or do mathematical calculations. Disorders included such conditions as perceptual disabilities, brain injury, minimal brain dysfunction, dyslexia, and developmental aphasia. Disorders not included: a learning problem that is primarily the result of visual, hearing, or motor disabilities, of mental retardation, of emotional disturbance, or of environmental, cultural, or economic disadvantage (p. 13).

The Individualized Education Plan

All students with disabilities are required by law to have an Individualized Education Plan (IEP). All too often, technology education teachers are not aware of a student's IEP or have had little to no opportunity to provide input during its development. Furthermore, technology education teachers are often inadvertently excluded from the annual meeting where the parent(s)/guardian, primary teacher, and possibly the student, gather to discuss and determine the components of the IEP. Components of the IEP discussed at the annual meeting include: current performance, annual goals, special education and related services, participation with nondisabled students, participation in state and district-wide tests, dates and places of services, transition services, age of majority information, and measurement of progress (Office of Special Education Programs, 2000). The IEP also addresses academic skills, basic skills, safety proficiencies, employability skills, and learning skills. Technology education teachers should be included in the planning and review of the IEP for at least two reasons. First, most students with special needs are placed in technology/vocational classes in order to outplace them from college-bound courses and programs. Second, students with special needs often perform better in the psychomotor activities inherent in technology and vocational courses.

Accommodations vs. Modifications

Although the terms "accommodations" and "modifications" are often used interchangeably, Tracy, from a previous study, made a very strong argument for precise terminology:

> There is a difference between an accommodation and a modification…You have to accommodate a

student for a curriculum. If you modify that curriculum to bring it down to a level, then that is not appropriate. They have to meet the standards that industry has set forward. And if we accommodate them to do that, then it's appropriate. If we have to modify that curriculum such that it's watered down or not meeting what the industry standards say that it is, that's not appropriate (Tracy Interview, March 17, 1999).

For example, reading a test, extended testing time, open-book tests, peer tutoring, oral testing, tape recording lectures, increasing the font size of textbooks, weighted grades on tests, and project-based assignments are all accommodations. These types of accommodations allow many students to reduce stress, perform more successfully, and demonstrate what they have learned. Furthermore, these types of accommodations do not change or modify the curriculum (Evanciew, 2001).

There are other forms of accommodation as well. For some students, an individualized instruction plan (IIP) may be developed. The individualized instruction plan is an extension of the IEP. The IIP states what the student has to do in order to meet his or her capability (Evanciew, 2001).

Accommodations for teaching and assignments do not have to be difficult. Some rather easy accommodations include: reading tests, recording lectures, having another student take notes, and extending time for assignments. Facility accommodations may take more effort and require administrative support. Typical facility accommodations for machines include guard rails, hand or foot controls, and warning lights or noises. Environmental accommodations include: adjusting height of furniture and/or equipment, individual work space, labels on equipment and work spaces, color-coded controls, and minimal distractions. Other general accommodations include: wider doorways and walk paths, elevators or wheelchair lifts, and ramps (Sarkees-Wircenski & Scott, 1995).

Conclusions and Implications

Accommodations are determined by reviewing the Individualized Education Plan (IEP) developed for each student with special needs. The most common accommodations included reading tests and assignments, extending testing time, and weighted grading.

Including students with special needs in technology education programs may be their best chance for success. Technology education programs typically rely on active, hands-on learning in order to provide students "real-world" experiences. This form of contextualized learning is often the most appropriate method in which students with special needs can participate, in that they understand where and how the material learned will be used (Rojewski & Schell, 1994).

The Americans with Disabilities Act extends the special needs definition from school to workplace. Innovative use of the IEP and technology education can aid in increasing an individual's capability and self-esteem, both of which are necessary for short- and long-term success in academics and the workforce. Technology education teachers have an opportunity to provide a good foundation for each student's future. If that foundation is not provided in the schools, we will be required to provide alternative support for those students for years to come.

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Cheryl E. P. Evanciew, *Ed.D., is an assistant professor in the Technology and Human Resource Development Department at Clemson University, Clemson, SC. She can be reached via e-mail at evancie@clemson.edu.*

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