

Chapter 4

Technology and Design for Inclusion: The Impact of Universal Design

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ABSTRACT

The inclusion of individuals with disabilities in concept and practice is not new to education. However, the attainment of inclusion has been a struggle in most Western countries since the 1980s. The application of Universal Design for Learning (UDL) to classroom practices has the promise of making the goal of inclusion more attainable. In this chapter, the authors outline a definition of inclusion as a foundation for the need for Universal Design. Then a description of the important principles of UDL is described, with attention to the research that supports its use and application. Lastly, the authors describe the technology trends that, along with UDL principles, have the greatest impact on education in K-12 classrooms, higher education, virtual settings, and in community settings with adults and seniors.

THE DEFINITION OF INCLUSION

Defining inclusion is a complex task. Legislators and professional groups within education have worked to define the term inclusion, and while most educational professionals know what the word means; it is often the case that the concept does not have a common definition across groups (Ainscow & Miles, 2009). For very young children, the idea of inclusion includes not only the child but the family in a broad variety of age appropriate experiences in the community as well

as the home and school (DEC/NAEYC, 2009). For school aged students inclusion refers to the legislated full access to the curriculum found in the general classroom (Rydak, Jackson, & Billingsley, 2000). Within the adolescent, the adult and aged populations, the term refers to the individual's ability to participate in community activities such as employment, leisure, and independent living (Wehman, 2013). McMaster's (2012) research on inclusion compiled various definitions of inclusion across countries and across eras. Within his work, McMasters cited Booth and Ainscow (2011) for

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their summary of inclusion as it relates to social justice model of thinking. Booth and Ainscow described inclusion as:

- Supporting everyone to feel that they belong;
- Increasing participation for children and adults in learning and teaching activities, relationships, and communities of local schools;
- Reducing exclusion, discrimination, barriers to learning and participation;
- Viewing differences between children and between adults as resources for learning;
- Emphasizing the development of school communities and values, as well as achievements; and
- Restructuring cultures, policies and practices to respond to diversity in ways that value everyone equally(p. 11).

These beliefs systems are also espoused by both adult and community educators worldwide.

The challenge that inclusion presents to schools and teachers is that inherent in the idea that all students, regardless of ability, should have access to the general curriculum. For a student with intellectual disabilities (IND) to learn the material in a grade level textbook the teacher has to redefine what “learn” means. It would be impossible to expect a student who reads on a 2nd grade level to be able to independently read and understand the material in a 7th grade textbook. However that is what inclusion of a student with IND might require. The teacher has to rethink how to handle the material so that the students can learn the most central concepts. The teacher may also have to redesign how the material is presented or how the student is evaluated, basing these decisions on the student ability level. One practice used in current pedagogy that aids the teacher in making these redesign decision is the application of Universal Design for Learning.

Defining Universal Design for Learning

Universal design for learning comes from the field of Universal design (UD), which has its origin in architecture (Story, 1998). The premise of UD is that buildings should be designed to permit the greatest number of people of all ages and abilities to use them with limited or no barriers (Center for Accessible Housing, 1995). Examples of UD are so commonplace now that we hardly think of them as revolutionary. Think about the use of door knobs versus door levers. The door knob is less user friendly for individuals with arthritis, or limited mobility. The alternative, the door lever allows for easier access for even those with limited gripping ability and is seen everywhere.

From architecture, the idea of erasing barriers for all people has spread to many disciplines, including education. Universal design has 11 principles that govern how the right design can make accessibility a reality regardless of disability, age, or physical abilities. UD as it applies to education is referred to as UDL. The Center for Applied Special Technology (CAST) has lead the way in articulating UD principles for learning. CAST describes UDL as framework for teaching and learning that is built on brain based research (Rose & Meyer, 2002). Figure 1 describes the three basic principles of UDL and the guidelines that operationalize those principles. These principles and guidelines have been applied to both instruction and curriculum to make them more accessible to all types of learners. See Figure 1.

UDL is a framework for teaching and learning that is based on brain networks rather than learning preferences. Principle 1: *Provide multiple means of representation*, is centered on the “what” of learning. This includes the facts or details that are learned by reading, seeing, hearing, or sensing. This information comes to us through the recognition network of our brain, including eyes, ears, taste, and touch. Research in the area of neuroscience indicates that the recognition

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