

## Universal Design to Support Access to the General Education Curriculum

Universal design is an approach to designing environments and products so they can be used by the widest range of users without adaptation. (Center for Universal Design, 1997). It is also a way to conceptualize access and to maximize learning for the greatest number of students.

### History and the Emergence of Universal Design in Education

The concept of universal design emerged from the field of architecture. Architects sought to design buildings and spaces that incorporated physical accessibility features such as wheel chair ramps, curb cuts, and automatic doors into their designs. They discovered that by considering and integrating a wide range of needs early in the design stage, they produced universally designed products that are often easier to use and benefit people with and without disabilities (Orkwis and McClain, 1999). For example, curb cuts that were originally intended to provide accessibility for people in wheel chairs also benefit people riding bikes or pushing baby strollers.

Over the past two decades, educators have begun to apply universal design concepts in schools and classrooms to ensure that instructional practices, materials, and educational environments meet the needs of the wide spectrum of students. Key issues include flexibility and adaptation to each student's unique needs and attributes. At its most basic level, universal design for education seeks to ensure that all students have the option of learning from instructional materials and practices that suit their abilities and learning styles in settings and facilities that can accommodate their various needs.

Two organizations that have contributed significantly to the conceptualization of universal design for education include the Center for Universal Design at North Carolina State University and the Center for Applied Special Technology (CAST). The Center for Universal Design developed seven basic principles for the universal design of products and environments. While these principles are not specific to education, they are being used by education researchers and practitioners as a foundation for implementing universal design in educational settings. These principles include the following:

- 1) **Equitable Use** to ensure that designs are useful and marketable for people with diverse abilities;
- 2) **Flexibility in Use** to accommodate a wide range of individual preferences and abilities;
- 3) **Simple and Intuitive Use** so that products or environments are easy to understand;
- 4) **Perceptible Information** such that information can be communicated effectively regardless of the user's sensory or physical abilities;
- 5) **Tolerance for Error** that minimizes the effects of accidents or unintended actions;
- 6) **Low Physical Effort** so that products and environment can be used comfortably and with minimum fatigue; and
- 7) **Size and Space for Approach and Use** to support access regardless of user's body size, posture, or mobility.

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CAST more recently has developed a framework called “Universal Design for Learning” that applies universal design principles to curricular materials and instructional strategies to support student learning. This approach emphasizes that curriculum needs to be flexible and presented in multiple formats in order to be accessible and appropriate for students with diverse backgrounds, learning styles, and abilities. The framework is based on the following three neural systems involved in learning: (a) recognition systems that identify patterns and objects, (b) strategic systems that tell us how to do things, and (c) affective systems that determine what is important and provide the motivation for learning. Universal Design for Learning advocates for flexible multiple media and tools targeted to these systems. It also supports curricular materials and instructional strategies that provide numerous means of representation, expression, and engagement (Meyer & Rose, 2000).

Universal design is also being applied to measure more accurately all students’ competencies without compromising validity (Thompson, Johnstone & Thurlow, 2002). In many cases, computer-based assessments are making such accessibility possible. For example, frequently needed accommodations, such as reading test questions aloud to students, test magnification, use of a keyboard to respond to questions, or use of a bilingual dictionary can be addressed, in part, by computer-based assessments (Dolan & Hall, 2001).

## Benefits and Examples of Universal Design in Education

Universal design in education means providing information in a variety of formats because multi-sensory methods of receiving and expressing information can make curricula more accessible for students with and without disabilities. Further, universal design means delivering instruction using a variety of teaching methods. Technology provides the capacity to easily change information from one format to another. Materials, tools, and teaching practices developed with universal design concepts in mind can support student’s learning by:

- **Building accessibility into design** to ensure that features meeting the needs of the widest range of students are integrally incorporated into the curricula. Such designs can prevent the need for adaptations or retrofitting. For example, electronic curricular material that is designed to be compatible with assistive technology devices allows paraprofessionals, parents, or teachers to more easily program these devices with appropriate content.
- **Providing adaptable materials and media** that allow students to choose and customize formats suited to their learning needs in a number of ways. For example, using **digitized text** students can change text-to-speech, speech-to-text, font size, colors, and highlighting. Digitized materials can also support students through built-in scaffolding or cues to assist with activities such as word recognition, decoding, and problem solving and optional background knowledge for concepts that may not be familiar to some children (Pisha & Coyne, 2001).
- **Using Multiple Media** such as video and audio formats provides a variety of ways to represent a concept and allows students to access the material through their different senses (Meyer & Rose, 2000). For example, computer-based simulations that include video description can help students with and without disabilities to visualize difficult concepts.
- **Providing challenging, salient, and age-appropriate materials** to students with a range of abilities. For example, a student with dyslexia can utilize decoding supports and text-to-speech features incorporated into digitized history or science books, which enhances their ability to access this content. A recent study by CAST found that students who read novels in a digital format with decoding supports are more motivated to read because they can access the content at an age-appropriate level

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that is just challenging enough (O'Neill & Dalton, 2002). In addition, students and teachers can also use the **Internet** as a resource to find current and real-world examples of concepts that can make information more salient and grounded (Meyer & Rose, 2000).

- **Presenting information in multiple, parallel forms** to accommodate diverse learning styles. For example, information can be presented orally in a lecture, visually through pictures, kinesthetically by modeling it in a demonstration, and using technology-based programs that further allow students to interact with the concepts (McGlauglin, 1998).

## Conclusion

There is no absolute formula for universal design in education. It is an approach to designing and creating materials, processes, spaces, and practices that embrace the widest range of abilities and needs possible. More than that, it is a commitment to accessibility. By seeking out materials and approaches that have used a universal design approach, and by using universal design concepts in day-to-day practice, teachers will help more students access the knowledge and skills they need from the general education curriculum and beyond.

## Where to go for Additional Information:

Center for Applied Special Technology (CAST)  
[www.cast.org](http://www.cast.org)

Center for Universal Design, North Carolina State University  
<http://www.design.ncsu.edu/cud/>

ERIC/OSEP Topical Brief: A Curriculum every student can use: design principles for student access.  
<http://www.cec.sped.org/osep/udesign.html>

National Center for Accessible Media  
<http://ncam.wgbh.org/>

The Trace Center, University of Wisconsin-Madison  
<http://www.tracecenter.org/>

Universal Design Education On-line  
<http://www.udeducation.org/>

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For additional information on this or other topics, please contact The Access Center at [accesscenter@air.org](mailto:accesscenter@air.org).

We also would like to draw on your expertise and experiences in providing access to the general education curriculum. Please share your experiences and success stories with the Access Center by sending them to the address or e-mail below.

We look forward to hearing from you.

**The Access Center: Improving Outcomes for All Students K-8**

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