

# Applying Universal Design Principles to Instruction

by  
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January 10, 2018

## What is Universal Design?

The Disability Act 2005 defines Universal Design, or UD, as:

1. The design and composition of an environment so that it may be accessed, understood and used:
    - To the greatest possible extent
    - In the most independent and natural manner possible
    - In the widest possible range of situations
    - Without the need for adaptation, modification, assistive devices or specialized solutions, by any persons of any age or size or having any particular physical, sensory, mental health or intellectual ability or disability, and
  2. Means, in relation to electronic systems, any electronics-based process of creating products, services or systems so that they may be used by any person.
- Thus, Universal Design (UD) is the design of an environment (examples - building, parks, products, services, websites, courses) that can be accessed and understood by the maximum number of people possible regardless of their age, size, ability or disability. The design should attempt to meet the needs of all the people who wish to use it.

Source: National Disability Authority

## How is UD beneficial to society?

UD benefits all members of the society as fundamentally it aims to achieve a good design by incorporating the needs of its users and making the environment accessible, usable, convenient, and enjoyable by all.

## What are common misconceptions about UD?

- UD is not a synonym for compliance with accessible design standards.
- UD is not just for the benefit of people with disabilities.
- UD is not just about "one size fits all".
- UD does not aim to replace the design of products and services targeted at specific markets.

## Why is UD important to Instruction?

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Section 504 of the Rehabilitation Act of 1973 states that:

“No otherwise qualified person with a disability in the United States... shall solely by reason of... disability, be denied the benefits of, be excluded from participation in, or be subjected to discrimination under any program or activity receiving federal financial assistance.”

Therefore it is the responsibility of educational institutions and academicians to make their courses as accessible as possible. Universal Design Principles used by instructors helps towards this goal of accessibility.

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## How does UD promote learning?

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### Universal Design for Learning

Recognition	Strategic	Affective
The "what" of learning	The "how" of learning	The "why" of learning
How the brain gathers facts and content in different ways.	How the brain organizes and expresses ideas.	How learners get engaged and stay motivated.
Present information and content in different ways.	Differentiate the way that students can express what they know.	Stimulate interest and motivation for learning.
More ways to provide multiple means of representation.	More ways to provide multiple means of action and expression.	More ways to provide multiple means of engagement.

Source: National Center on Universal Design for Learning

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## Statistics on disabilities nationwide

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A report by the National Center for Education Statistics found that 11% of undergraduates in both 2007–08 and 2011–12 reported having a disability. In 2011–12, the percentage of undergraduates who reported having a disability was 11% for both males and females.

Source: U.S. Department of Education, National Center for Education Statistics. (2016). *Digest of Education Statistics, 2014* (2016-006)

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## What are the elements or principles of UD?

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1. Equitable Use
2. Flexibility in Use
3. Simple and Intuitive Use
4. Perceptible Information
5. Tolerance for Error
6. Low Physical Effort
7. Size and Space for Approach and Use

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## Equitable Use

Design should provide same or identical usefulness to users with different abilities.

Example: The use of a light background contrasting with dark colored text for course design would allow for readability by maximum number of users.

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## Flexibility in Use

The design should provide choices and adaptability so that people with different preferences and abilities can use it.

Example: To provide choices for users with different abilities, the course should be available to view and understand in different formats such as power point presentation, simple text, and videos with closed captions.

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## Simple and Intuitive Use

The design should be simple to understand and not rely on the user's prior knowledge and experience.

Example: For any activity, the structure, formatting, and instructions should be simple and sequential.

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## Perceptible Information

The design should convey essential information to the user regardless of their abilities.

Example: The font size of the headings, subheadings, and text chosen carefully would help in focusing attention on essential information. Use of tables and graphs with text explanation could be used to further explain.

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### Tolerance for Error

The design should minimize consequences due to unintentional accidents or actions.

Example: Announcements could be sent out for activities so that students can ask any questions and clarifications about them. Features on the Learning Management System (LMS) could be used to alert the students if mistakes are made in submitting the assignment.

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### Low Physical Effort

The design should be easy to use physically and not cause any physical strain.

Example: Any activity/instruction should be designed so that it is not too long to read to avoid eye strain. Use of mouse would not be necessary to understand or perform activities. The entire activity instructions should be accessible by the keyboard.

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### Size and Space for Approach and Use

The design should be easy to use for people of diverse abilities and not be restricted because of their different mobility, size, or posture.

Example: This idea of universal design is applicable more to physical aspects and may not be directly applicable to our day to day online instructional activities. However it should be kept in mind while designing the course.

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### Universal Design for online content for instruction?

Whether it be a face to face class, blended class, or an online class, the use of technology and online content has become an inherent part of teaching. The degree to which these are used and the ways in which they are used may differ from course to course, from instructor to instructor, and from institution to institution. The following slides offer some guidelines to keep in mind while designing online content to make it accessible to as many students as possible.

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## Typography - Fonts

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- Contrast between fonts should be obvious
- Use no more than 2-3 fonts for a given course
- Bulk of course should be size 12
- Choose a font based on whether appearance should be formal or informal
- For Print documents use serif fonts such as Times New Roman or Courier
- For Web/online content use sans serif fonts such as Arial or Verdana

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## Typography – Readability and Hierarchy

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### Type Readability

- Left justified text is easier to read
- Body of text should not be too long
- Adjust spacing between lines for an easier read

### Type Hierarchy

- Headings and subheadings should stand out
- Do not overuse bold and uppercase – it will feel as if you are shouting at the audience

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## Color

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- White (or light background) with dark typeface works best.
- 1 out of 12 people have some kind of color deficiency so do not rely only on color coding to impart information.
- Use the colors to create mood and draw attention to certain objects (if necessary educate yourself on color psychology).

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## Design

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- Layout of pages should be organized and logical.
- Repetition in structure allows for reader to scan and absorb information better.
- Cluttering should be avoided; use of white space is good design practice.

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## Navigation

- Course site should be structured and easily navigable.
- The clicks used to reach the information needed should be logical.
- Important information should be easy to find and placed in an eye catching manner – use of menus on LMS is helpful but do not create too many menu items (not more than 10).

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## Resources for Close Captioned Videos

- An Australian company called "cap that! Captioned for learning" provides the URLs for websites and companies that provide close captioned videos of all types. The link may be viewed at <http://www.capthat.com.au/resources/find-captioned-videos>. The list of various company sites is annotated and includes information about the quality of captioning and the grade level for which the videos are appropriate. These include major media companies like the BBC, ABC, PBS, NBC and Khan Academy and others.
- "Amara" is a site that provides a tutorial and captioning service so that personal videos may be easily closed captioned for free. <http://www.amara.org/en/cap> that also provides links to subscription-based educational videos with captioning. They also provide a tutorial on how to caption your own videos within YouTube at <http://www.capthat.com.au/how-caption-youtube-video>.
- Other sites that provide their captioning with their videos include TED Talks at <https://www.ted.com/NationalScienceTeachersAssociation> <http://www.nsta.org/college/connections.aspx>, and Deaf MD at <http://www.deafmd.org/> (C. Copeland, personal communication, September 19, 2014).

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## Multimedia

- When inserting images include description for the image for screen readers to read it.
- If a document requires a student to scroll then consider putting bookmarks.
- Use relevant instructional graphics to supplement written text.
- Place graphics and text close together.
- Include audio to explain graphics.
- Avoid using visuals, text, and sounds that are not essential to instruction.
- Use a conversational tone to personalize the learning.
- Provide closed captions to videos. If not possible, then provide a transcript.

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## References

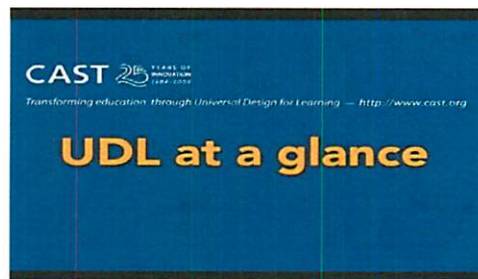
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# Illustration and Examples for Universal Design Principles as Applied to Instruction

by  
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February 7, 2018

What does Universal Design for Learning mean?



<http://www.cast.org/our-work/about-udl.html#WnoKBOjwa70>

[https://www.youtube.com/watch?time\\_continue=4&v=bDvKnY0g6e4](https://www.youtube.com/watch?time_continue=4&v=bDvKnY0g6e4)

## Understanding Universal Design?

### Universal Design Principles (1997)

- Equitable use
- Flexibility in use
- Simple and Intuitive use
- Perceptible Information
- Tolerance for error
- Low physical effort
- Size and space for approach and use

<http://universaldesign.ie/What-is-Universal-Design/The-7-Principles/>

### Universal Design for Learning

- Multiple means of representation
- Multiple means of action and expression
- Multiple means of engagement

<http://www.udlcenter.org/about-udl/whatisudl>

### Universal Design for Instruction

- Equitable use
- Flexibility in use
- Simple and Intuitive use
- Perceptible Information
- Tolerance for error
- Low physical effort
- Size and space for approach and use
- Community of learners
- Instructional climate

<http://udi.uconn.edu/index.php?q=node/12>

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What colors to choose for presentations?

A: Which background color and text color do you like?

B: I like this background color, but am not sure about the text color.

C: I am not sure if this color scheme is the best.

D: The background is bright and the white shows on it well!

E: I like this color combination as it is easy on the eyes.



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Do you want to add pictures?



Make sure to provide alternative text description (ALT TXT) for the pictures.

Thank You All !