

Understanding POUR - The Basics of Universal Design for Learning

March 25, 2020



Today's Presenters!

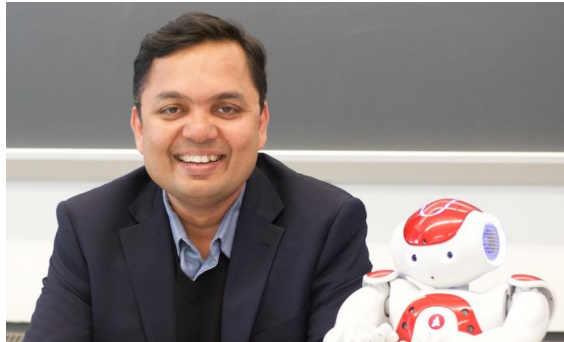


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Director/PI ATE Central
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National AEM Center
at CAST

Special Guest



Dr. Mohammad Azhar
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Assistant Professor, CIS Department,
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Poll: What is your reason for joining us today?

- A. I am new to accessibility and want to learn more about the topic
- B. I have students with disabilities enrolled in my courses and want to learn how to create accessible content for them.
- C. I lead others who develop content and want to provide my team with tips and resources on accessibility
- D. Other: Please share in the chat

ATE: Advanced Technological Education

- NSF Funding – focus on technician education; program development; professional development; community colleges
- Approximately 311 projects & centers currently funded
- Not just a funding program; a true community
- Variety of cross-cutting support for community members baked into the program

About ATE Central

ATE Central's primary purpose is to amplify the impact of ATE.

ATE Central offers:

- Information hub and portal
- Resource collection
- Services and tools
- Outreach and dissemination
- Annual Spotlight Series

AEM Center Mission and Goals

Provides expert technical assistance to increase the **availability and use** of high-quality accessible materials and technologies



Stakeholders include:

- Early Childhood Programs (EC)
- States and Districts (K-12)
- Institutes of Higher Ed (IHEs)
- Workforce Development and Workplace Agencies (WF)
- Publishers and Developers
- Parent Centers

CAST Mission and Goals

CAST is a multifaceted organization with a singular ambition: **Bust the barriers to learning** that millions of people experience every day.

We do this by helping educators and organizations apply insights from the learning sciences and leading-edge practices to educational design and implementation.



Poll: What is your current role?

- A. I belong to an ATE project or center
- B. I am seeking ATE funding
- C. I am at a non-ATE institution
- D. Other: Please share in the chat

Objectives

- Explain what is meant by “accessible” and how accessibility fits into the Universal Design for Learning framework
- Provide examples of the application of the four POUR principles in the context of a robotics curriculum
- Identify AEM Center and AccessATE resources for further learning about accessible educational materials

What does accessibility mean to you?

Please share your answers in the chat.



Functional Definition of Accessibility (US DOE OCR)

A person with a disability can:

acquire the same information

engage in the same interactions

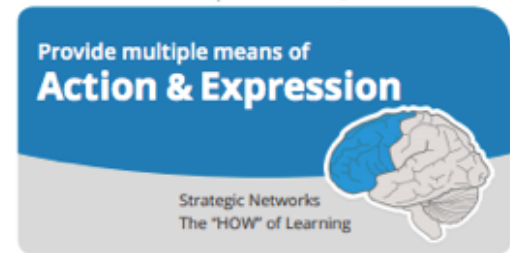
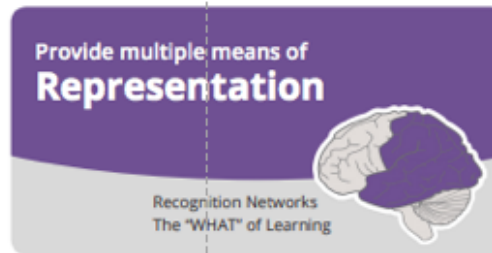
enjoy the same services

in an equally effective,
equally integrated manner,
and with substantially
equivalent ease of use

as a person without a disability.

Universal Design for Learning

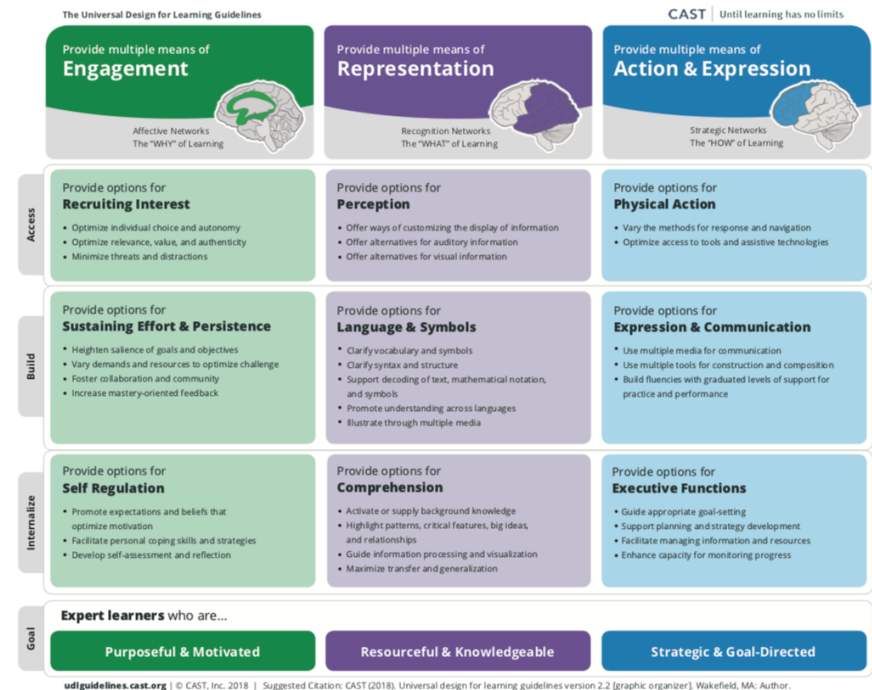
A **framework** based on scientific insights into how humans learn that seeks to optimize instruction in order to allow **every person** to **become an expert learner**.



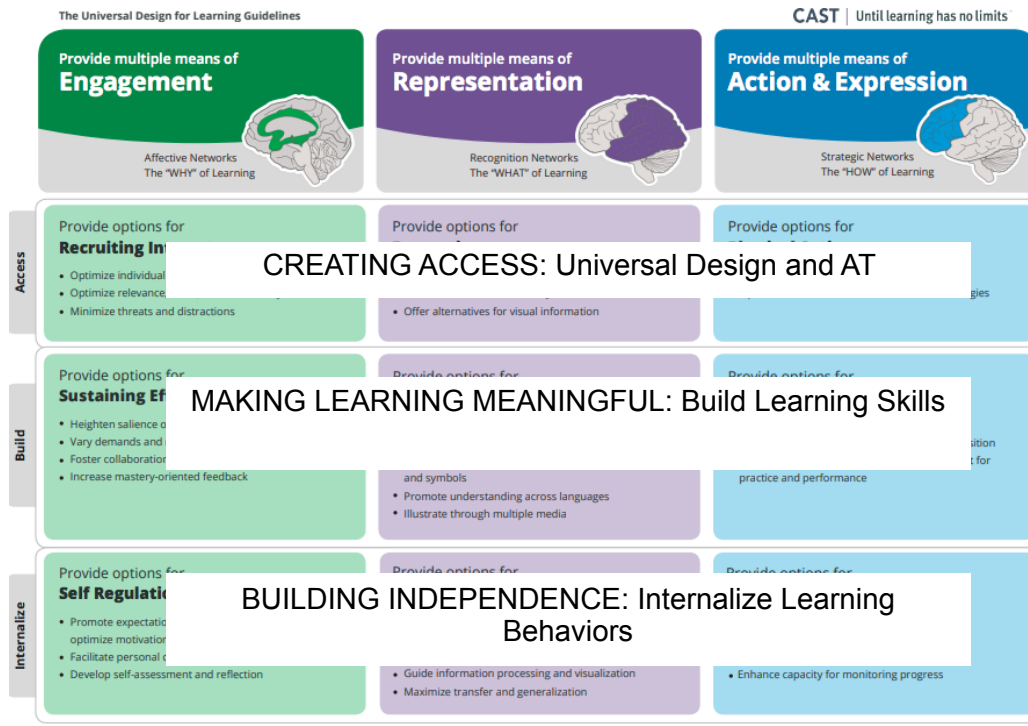
Accessibility and Universal Design for Learning

“The purpose of education is not to make information accessible, but rather to teach learners **how to transform accessible information into useable knowledge.**”

Introduction to the [UDL Guidelines](#) (CAST, 2012)



3 Layers of UDL Guidelines



POUR on the Accessibility: WCAG

Web Content Accessibility Guidelines 2.1

POUR

Perceivable | Operable | Understandable | Robust



 National Center on
Accessible Educational Materials

#aem4all

Leveraging Resources: Creating Accessible Materials from the Start

Designing for Accessibility with POUR



Many of the learning materials educators use in the classroom are self-created. This has been made possible by the greater availability and improved ease of use of authoring tools. These tools now often include options for adding [accessibility](#) into the content creation workflow, and standards such as the [Web Content Accessibility Guidelines \(WCAG\)](#) [↗](#) provide guidance for how to do so. WCAG, which is now at version 2.0, is the international standard for making web content accessible. It is the foundation for many national accessibility laws, including [Section 508](#) [↗](#) in the U.S.

The WCAG guidelines are written in technical language that can be confusing to even veteran developers. Fortunately, they can be distilled into a set of simpler principles, as captured by the acronym **POUR**, that define four qualities of an accessible user experience.

Designing for Accessibility with POUR



Advice from Maya Angelou

“Do the best you can until you know better. Then when you know better, do better.”

Implementing POUR in a K-12 Educational Robotics Curriculum

5 Practices for Improving Accessibility of a Lesson Plan

K-12 Educational Robotics Curriculum at BMCC CIS Outreach

Curriculum is developed for

- After-school high school robotics curriculum
- K-12 in class –high school robotics elective class
- using EV3 Lego Robot in various programming languages (e.g., visual programming, python)

Designing Accessible Curriculum

- Identify curriculum
- Set up a training with TA Specialist Luis Perez from National AEM Center at CAST
- Make the curriculum accessible –feedback from the specialist

5 Practices for Improving Accessibility of a Lesson Plan

1. Mark up the document with styles
2. Use table headers
3. Create real lists
4. Create descriptive hyperlinks
5. Provide alternative text for images

1. Mark up the document with styles

Apply styles to indicate section headings
(should be descriptive and unique)



3 Benefits of Using Styles for Section Headings

- Provide in-page navigation for screen reader users
- Reveal the structure of the document
- Ensure consistency (change style once to see changes cascade through document)

Styles should follow a logical order

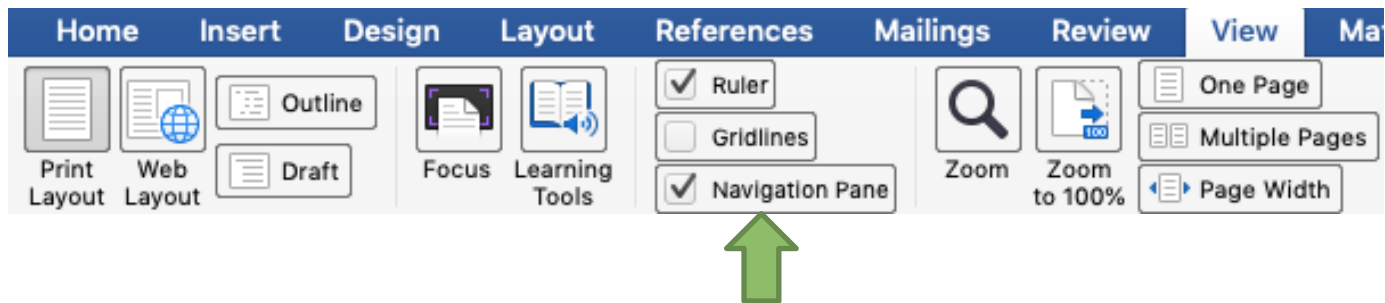
Nest styles properly to provide a meaningful outline of the content.

Example from Lesson 1 of Robotics Curriculum:

- H1 – Lesson 1: Intro to Hardware Construction and Software Programming
 - H2 – Vocabulary/Terms
 - H3 – Introduction: What is a robot?
 - H3 – Why use robots?
 - H3 – Where are robots used?
 - H2 – Hardware
 - H3 – Constructing a robot
 - H3 – Cable Connections
 - H2 – Software
 - H3 – The EV3 Software

Check your work

Use the Navigation pane (found under View) to simulate how a screen reader user navigates



Use of Styles - Questions?



2. Use of table headers

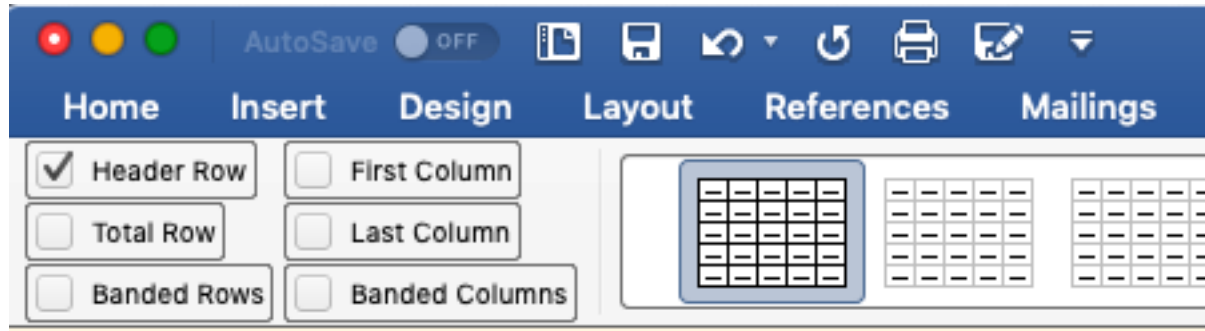
Table headers (for rows and/or columns) help screen readers describe each value in a table.

Example from Lesson 1 of Robotics Curriculum:

Port	Sensor/Motor
1	Touch sensor
2	Gyro sensor
3	Color sensor
4	Ultrasound sensor
A	Medium motor
B and C	Large motors

Add a header row in MS Word

With table selected, choose Table Design, Header Row



Note: Google Docs does not have an option for adding table headers.

3. Creating Real Lists

- Important to use the “Bullets and Numbering” options in the Home tab to create lists.
- Screen readers can announce the number of items in the list



Example: A List Created Manually

There are five different types of variables you can choose to read from or write to:

- Numeric: Holds any numeric value.
- Logic: Holds either a true or false value.
- Text: Holds a text value.
- Numeric Array: Can hold several numeric values.
- Logic Array: Can hold several true or false values.

Example: A List Created with “Bullets and Numbering”

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Tables and List - Questions?



4. Create descriptive hyperlinks

Screen reader users may access the links on a list, without the rest of the for context. Which of these two links allows you to download the EV3 Software?

- [Click Here](#)
- [Click Here](#)

Let's try that again

Let's try that again, this time with more descriptive text. Which of these links takes you to the Course Website?

- [Download EV3 Software](#)
- [EV3 Building Instructions](#)

Avoid raw URLs

Reading the following URL would be confusing to a screen reader user:

https://drive.google.com/file/d/1pcpOZs_YBcH0NHjUTgD66Z1WSEgz3ITA/view?usp=sharing

Let's make it more descriptive:

[Lesson 1: Intro to Hardware Construction and Software Programming](#) (Google Doc)

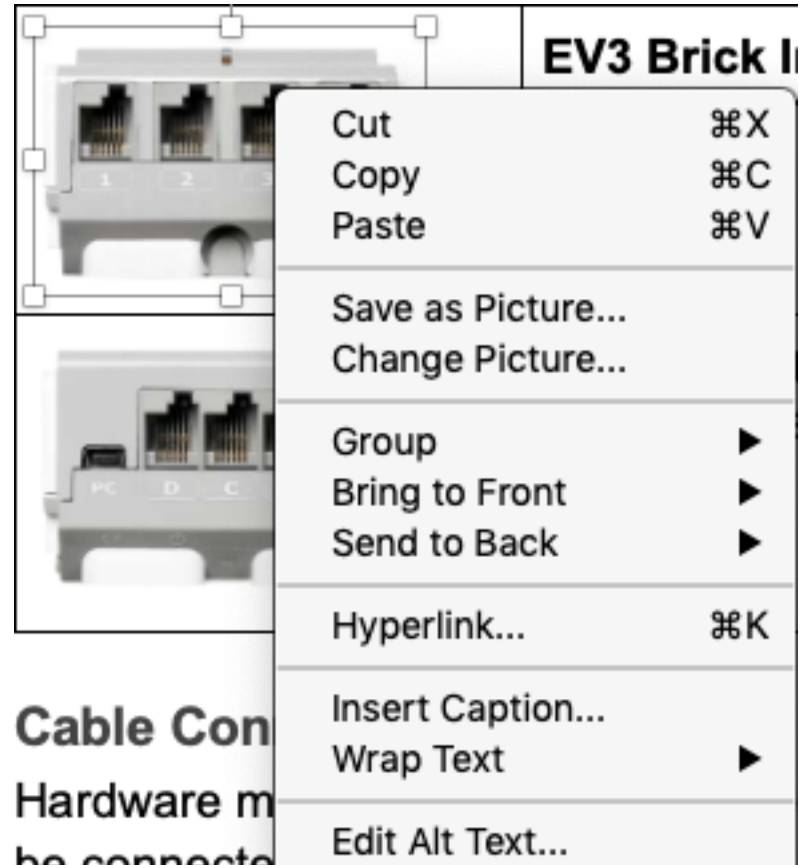
5. Alternative Text for Images

Alternative text: a concise description of the key information conveyed in an image.

Like describing the image to someone over the telephone.

Add Alternative Text (Office 365)

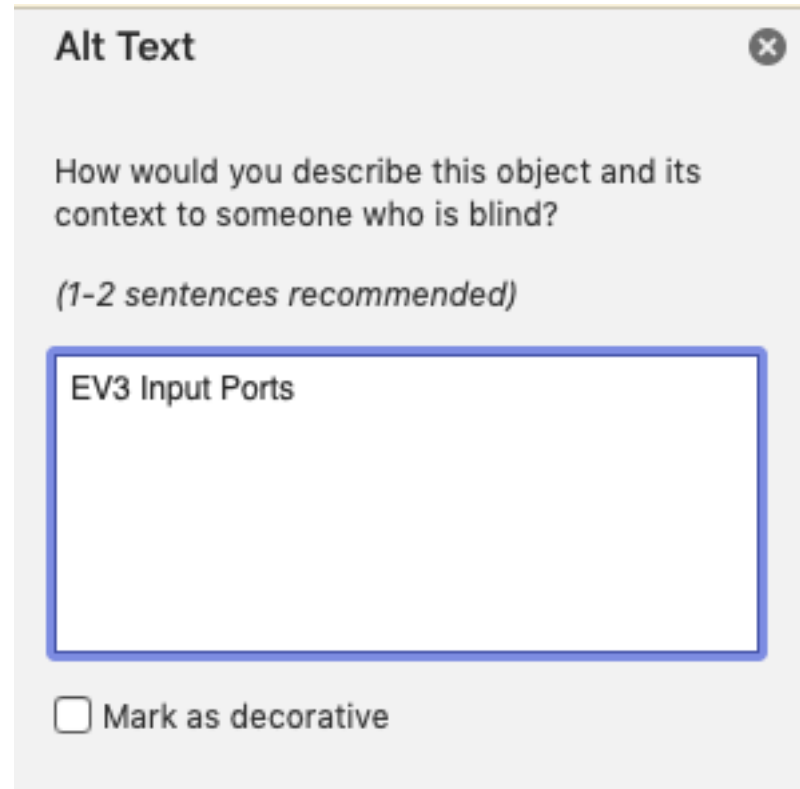
1. Right-click on image and choose Edit Alt Text.



Add Alternative Text (Office 365) – Step 2

2. Enter your description manually or select “Generate a Description for Me” to use Artificial Intelligence.

Alternative: Select “**Mark as decorative**” if the image is not required for understanding



Alt Text

How would you describe this object and its context to someone who is blind?

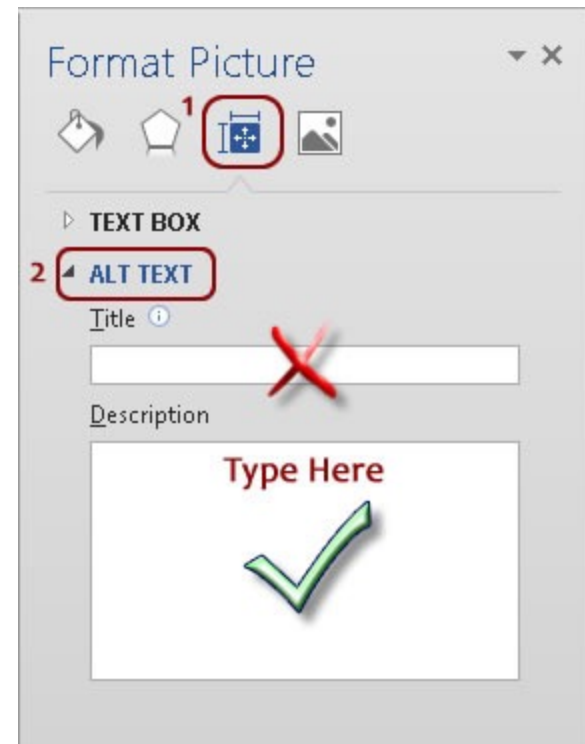
(1-2 sentences recommended)

EV3 Input Ports

Mark as decorative

Add alternative text (Older versions of MS Office)

1. Right-click on image and choose **Format Picture**.
2. Select the **Size and Position** tab (third from the left).
3. Use the **Description** field to provide alternative text.



Basic Guidelines for Image Description

- First, understand the purpose of the image
- Second, start with a broad overview, the big picture
- Third, focus on a few relevant details (see Purpose) and describe any important relationships

Quality Image Descriptions

- [WebAIM: Alternative Text](#)
- [An alt Decision Tree](#) (WAI)
- [DIAGRAM Center](#) (more complex images)

Links and Images - Questions?



AEM Center Resources

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Designing for Accessibility with POUR



Connect with the AEM Center

- Bookmark our website:
aem.cast.org
- Email us at aem@cast.org
- Follow us on Twitter
 - @AEM_Center
- Like us on Facebook
 - @AEMCenter



Connect with ATE Central

- Visit us at atecentral.net
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- Follow us @ATECentral

