CULTIVATING ACCESS:

A Design Educator's Guide to Teaching Access & Inclusion

What we see changes what we know. What we know changes what we see.

— Jean Piaget —

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There is only one way to see things, until someone shows us how to look at them with different eyes.

— Pablo Picasso —

INTRODUCTION

From the invention of the of the printing press in the first industrial revolution to the introduction of the personal computer in the 80's, graphic designers have proven to be adaptable in the face of change. Rapid advancement in technology and the need for speedy content creation in the information age is transforming the role of a traditional graphic designer away from simply 'making things' to more of a communication strategist. A modern graphic designer needs to be equipped to create multi-media design solutions that are holistic and moving beyond just aesthetically pleasing, message-centric approaches from the industrial age. As educators we need to prepare our students with an arsenal of technical and critical thinking skills to successfully adapt to social, technological and cultural changes in the field.

In a report evaluating trends in design education, the AIGA Designer 2025 report highlights 'complexity' and 'ethical core values' as trends that are shaping professional practice[1]. The report discusses how the shift to more human-centered design adds a layer of complexity that students need to consider in their work. Considering the complexity of human diversity paired with an inclination for ethical purposeful design work, accessibility and inclusive design is needed in our graphic design curriculum. Preparing our students with the technical skills and mindfulness to create accessible and inclusive communications will equip them to start thinking critically about their work and the role it plays in a bigger social context.

As design educators we want to future-proof our students and supply them with experiences and tools that will serve them well for their entire careers. If we consider that 22% (6 million) Canadians identify as disabled[2] and that the 65+ population is expected to grow 68% over the next 20 years[3], accessible and inclusive design processes will continue to develop and become commonplace in professional practice. Design education needs to provide students with the technical and conceptual knowledge to create accessible communications in order to equip them with skills to be adaptable in these developing practices.

1 AIGA Design Educators (2017, Aug. 21). AIGA Designer 2025: Why Design Education Should Pay Attention to Trends.

2 Statistics Canada. Sourced from https://www150.statcan.gc.ca/

3 Ontario Ministry of Senior Affairs. (2017). Aging with Confidence: Ontario's Action Plan for Seniors.

The addition of these concepts and techniques into our existing teaching practices can provide students a solid foundation in accessible graphic design.

As design educators we are often chasing trends, trying to balance the core knowledge of our discipline with the latest technology with the limited amount of time students are in our classrooms. In a fast-moving industry, the list of required skills for a graphic designer is getting longer and educators are struggling to get a little bit of everything into our programs. Layering in inclusive design principles and accessibility into our already jam-packed curriculum seems daunting but it doesn't need to be. Accessibility and inclusion are holistic concepts that permeate design in small but significant ways. Each little change we implement into our design processes, our document setups and production processes can greatly improve access to information for a broader audience. This guide is designed to help you identify the small 'wins' in accessibility and inclusive design to apply them to your existing curriculum. In design education, each step we take towards inclusive graphic design will create awareness for students that will plant the seed for future learning which will prepare the next generation of graphic designers to be active participants in a broader cultural shift to standardize accessibility.

> ***"Real change, enduring change happens one step at a time."***
>
> **— Ruth Bader Ginsberg —**

ABOUT THE GUIDE

This guide was developed primarily through secondary research although design faculty and students were surveyed to provide insights on our current teaching practices and approaches to accessibility. The guide is intended as a 'living' document; a first step on our journey to incorporate accessibility and inclusive design teachings into our existing curriculum.

The tools and approaches presented in the guide are certainly not all-encompassing but rather intended as a practical reference to help design educators get started and supplement their course and program planning.

Course Planning

The guide is divided into sections that represent common courses found in most three year graphic design diploma programs in Ontario. Each section is a curated collection of foundational knowledge and technical skills related to accessibility. Sample formative and summative assignments are provided as examples of how accessibility could be incorporated. The assignments are presented with desired learning outcomes. These learning outcomes could also be adapted to suit existing assignments you have for your course. Each section will also highlight 'real-world' design example that can be discussed with students to reinforce the importance of accessibility and inclusion. Lastly, each section will conclude with additional design related, web-based resources that can be shared with students to reinforce deeper learning on the topics.

> *"Curriculum can react to the current state or it can anticipate emerging challenges"*
>
> **— Meredith Davis —**

Program Planning

An integrated and holistic approach to including access and inclusion into our design curriculum is ideal for the student experience. When students are exposed to these concepts and techniques consistently throughout their studies, they will perceive access and inclusion as an integral part of their design practice. To achieve this goal in our design programs, it will need to be a team effort.

In program planning we need to be mindful of overlap and when accessibility content can be introduced and reinforced in our programs. Recognizing the complex nature of program planning with faculty teams that are a mix of full-time and part-time faculty, building consistent learning experiences and holistic curriculum can be challenging.

Including explicit learning outcomes related to accessibility and inclusive design in our course outlines can help prevent repetitive fixation on certain aspects. If we all teach the same few skills over and over in each class, students may leave the program with an over-simplified perception of accessibility and inclusive design.

If we consider the student's journey and how we scaffold their learning experiences in other aspects of graphic design, their first year could be focused on building their factual and conceptual knowledge regarding accessibility. Focusing on terminology, recognizing human diversity and how a few small techniques, such as adding alt-text, can positively impact the broader audience. Following Bloom's Taxonomy, once the factual and conceptual knowledge is gained, we can move on to procedural knowledge in second year.

Proposed Program Plan for Accessibility & Inclusive Design Topics.

YEAR OF STUDY	ACCESSIBILITY & INCLUSIVE DESIGN FOCUS
1	• Understanding the impact of Accessibility & Inclusive design. • Adding alt-text to all projects • Apply color contrast ratio to all projects
2	• Explore accessible and inclusive design processes. • Apply appropriate document structure & tagging.
3	• Apply accessible and inclusive design processes to all work. • Innovate and solve design problems related to accessibility and inclusion.

ABOUT THE GUIDE

Courses in second year can focus on the application of inclusive design processes and technical software skills to improve the accessibility of their projects. At this mid-point in the program, students will get comfortable with accessible design workflows but also have an opportunity to evaluate the limitations with our existing tools and where there exist gaps in how we communicate as a society. As Bloom's model suggests, once students are in their final year they are prepared to innovate and create design solutions that consider the breadth of human diversity and may push beyond traditional boundaries of graphic design.

The sections in this guide consider the scaffolded nature of core courses, such as design process and design applications and how they are part of a student's course load for the duration of their studies. The guide captures core concepts of accessible graphic design that can be distributed throughout the program in small but regular doses to students. When planning the learning experiences for students at the program level, this guide can help you and your team see the 'big picture' and plan for small incremental changes at the course level that will expose students to a well-rounded learning experience that will benefit them upon graduation.

> ***"You can't legislate goodwill — that comes through education."***
>
> **— Malcolm X —**

ACCESSIBILITY LEGISLATION

Graphic design is not a heavily regulated industry although most designers are familiar with their responsibilities with regards to copyright and intellectual property laws. In Canada, graphic designers also need to be knowledgeable about the role they play in maintaining the accessibility standards.

In 2005, the AODA (Accessibility for Ontarians with Disabilities Act) was legislated with the goal of creating an accessible and inclusive province by the year 2025. The AODA aims to remove barriers to access in various aspects of daily life with specific compliance time frames that affect all public and private sector organizations. To reflect the various areas of daily life, the AODA is comprised of 5 standards. As graphic designers, the Information and Communication Standard outlines our responsibilities for accessibility compliance in Ontario. This standard addresses the sharing of public information in print and digital formats.

Ontario is the first province in Canada to have such comprehensive accessibility legislation with compliance reporting and enforcement strategies.

The AODA is setting a precedent in prioritizing accessibility and inclusion for the rest of Canada. In 2019, the Accessible Canada Act came into effect with the goal to proactively identify, remove and prevent barriers to accessibility for all areas under federal jurisdiction. The Accessible Canada Act also highlights communications along with information and communication technologies as areas of focus for accessibility compliance.

It's important to note that legislation and compliance are only one aspect of building a more accessible and inclusive future. In a recent review of the Information and Communications Standards it was noted that the current standards are not keeping pace with technology[1]. Recommendations were made to consider regulatory measures that embrace continuous adaptation for digital communications rather than strict deadlines. For graphic designers, the compliance guidelines are not always explicit. Both design and access are contextual and result in many grey areas when trying to define standards. These ambiguous areas in the standards invite creative innovation and opportunities for future designers in accessible and inclusive design.

1 Listening to Ontarians with Disabilities: Report of the third review of the Accessibility for Ontarians with Disabilities Act

Accessibility doesn't have to be perfect, it just needs to be a little bit better than yesterday.

— Léonie Watson —

FACULTY GUIDE CONTENT

The guide is divided into 4 fundamental topics for accessible graphic design.

While these topics have been isolated to emphasize their significance, it's important to recognize that these topics are not standalone but rather all work together to create accessible communications.

DESIGN PROCESS

Foundational Knowledge

An important aspect of design education is equipping students with a foundation in design process and thinking. Teaching students to approach their design projects strategically and to create concept-driven designs that can communicate across multiple channels is an important skill that will help them adapt in our rapidly evolving industry. Introducing students to inclusive design principles alongside traditional design principles will enable students to consider accessibility and inclusion from the onset of their projects. Inclusive approaches to research, ideation and testing will broaden students' perspectives on how their communications pieces will be received, identify potential barriers and create design solutions that can be universally accessed. Considering access and inclusion through all the phases of a design project can eliminate the 'extra work' of remediation at the end to make their communications accessible. It will be important to reinforce to students that 'how' we design plays a significant role in 'what' we design.

Key Terms

Ableism
A bias in favour of able-bodied people.
This bias characterizes people with disabilities as inferior.

Inclusive Design
A design methodology in which the extreme users are considered versus the majority or average user.

Accessible Design
Design outputs that are adaptable and functional for users of all abilities.

Universal Design
Design outputs that are accessible to all people, regardless of age, disability or other factors.

An Introduction to Inclusive Design

Inclusive design is a process that considers barriers and exclusion at every step of the design process, not just in the testing phase. An inclusive approach to design creates accessible outcomes that benefit all users, not just those with disabilities. Ultimately, if we are successful in teaching accessible design to our students, we will also be fostering an inclusive design process that they can leverage in all their future work.

The Inclusive Design Research Centre at OCADu has defined the three dimensions of inclusive design as:

- **Recognize Diversity and Uniqueness**
  Consider the outliers rather than the majority when designing.

- **Inclusive Processes and Tools**
  Connect with communities and those with lived experiences rather than making assumptions.

- **Broader Beneficial Impact**
  Reflect on the broader impact of the design and how it contributes to culture and society.

This can be a useful framework to present to students at the onset of their design projects to help guide them in their research and iteration phases. While this may not apply to every design project, considering even one of these dimensions when developing a design solution can help foster a broader context for their work and anticipate barriers to the message they are trying to communicate. Identifying where audiences might be excluded early in the design process can help students refine their design deliverables to include alternative formats and have a more representative aesthetic.

What is Representation?

In graphic design, the concept of representation is tightly woven into the nature of our work. We use graphic representations and symbols as shortcuts to quickly communicate complex ideas and narratives. In the context of accessibility and inclusion, representation offers another layer of consideration for designers in terms of barriers and who we might not be representing.

Designers select imagery and symbols that ultimately describe the tone of the piece and the audience it's crafted for. Mindfulness in the diversity of the images we choose and the cultural tropes we lean on can help create more inviting and inclusive communications that represent our audiences in more holistic ways.

In their design research, students should be encouraged to question their representations of race, gender and disability in the design choices they are making. Remind students that the audience they are designing for is not always like them and that information can be accessed in various ways. While we don't need to teach a module on critical disability studies, providing students with resources and examples to build awareness of the various disability communities can help improve the accessibility of their designs.

Common Alternative Formats

Accessible PDF

HTML pages

Plain-text (RTF or TXT)

Large print

Audio formats

Braille

What are alternative formats?

As a designer, students need to consider that not all users will access the information in the same way. Information that is only presented in print formats will create barriers for those who rely on screen readers, dynamic braille displays, translation and/or magnification software. In the digital age, most print information has a digital counterpart but it's important to consider these different representations of the information at the outset of the project.

Identifying how users will access the information and who the primary audience is will help determine which alternative formats are needed. By taking an inclusive approach to your projects, you can design a layout that would be both suitable for both print and digital access.

Classroom Discussion

a) Representation of Disability

Nordstrom July 2014 Catalogue

As designers, we play a role in choosing who gets represented in the media and how. Let's explore a real-world example and consider its consequences.

Nordstrom, a large American fashion retailer has been featuring models with disabilities in their catalogs since 1991.

You can view their rationale and examples of past catalogs on their website at Nordstrom.com.

Discussion Questions:

- What do you think of Nordstrom's approach to making fashion more inclusive?
- Would you consider their catalogue to be 'inspiration porn'?

What is Inspiration Porn?
Watch Stella Young's 2014 TED Talk, **"I'm not your inspiration, thank you very much"** to get a fresh perspective on how the media represents people with disabilities.

b) Designing Alternatives

Creating alternative accessible formats for your designs can allow more people to access the information you are sharing. Have your class consider these questions when designing alternatives.

Discussion Questions:

- When should you consider designing alternatives vs. a single universal design?
- When you create alternative formats — is this still being inclusive or are you 'othering' people with disabilities?

Suggested Assessments

1. Formative Assignment

Accessibility Related Learning Outcomes:

- Identify alternative formats to communicate information
- Create accessible alternative formats
- Reflect on non-visual methods of communication

Photo by Anthony Tuil on Unsplash

Assignment Brief :

- Provide students with a simple event poster that is only intended for print OR have students find a printed poster in their environment.

- Students will create one example of an accessible alternative based on the information in the printed example.

Deliverables :

- Without being prescriptive, allow students to explore different ways of communicating the same information in alternative ways.

- In addition, students will submit a reflection on their thought process for their alternative format and how the distribution of the information might need to change.

2. Summative Assignment

Accessibility Related Learning Outcomes:

- Design a marketing campaign using inclusive design principles
- Create marketing materials in accessible formats
- Reflect on how the disability community is represented

Assignment Brief:

- One & All Delivery is a local courier service that delivers via public transit and employs people from the disability community. They provide inclusive employment opportunities and competitive professional delivery services in the downtown core. They are currently expanding their service area and will need to promote themselves in this new market.

- In order to design the campaign, students will need to consider the accessibility of the campaign, its delivery method and how they will represent the disability community.

Deliverables:

- A print and digital campaign to promote the expansion of One & All Delivery into a new market.

Inclusive Design Factors

1. Students should consider the accessibility factors in their campaign design from the beginning of the project.
2. Students will need to carefully select their visual representations to fairly represent the diversity of the couriers.
3. Students will need to evaluate appropriate methods to deliver the campaign that will consider the diversity of their audience.

Technical Skills

When students are initially introduced to accessibility and inclusive design, it's helpful for them to understand how information can be accessed in alternative ways.

Here are some examples of tools that are available for students to explore diversity in communication.

a) Disability Simulators

There are many free web-based simulators that can help provide insight in how diverse users might experience digital content.

Web Based Simulators:
Funkify.org

Coblis

List of Various Simulators

b) Voice Over on Mac

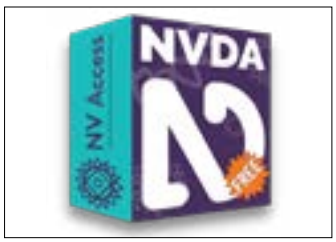
Apple's operating system is equipped with many accessibility features, including a screen reader.

Tutorials:
Voice Over Basics

Getting Started with VoiceOver on Mac

c) NVDA for PC

Non-Visual Desktop Access (NVDA) is a screen reader software available for PC users.



Tutorials:
NVDA User Guide

Screen Reader Basics

Additional Learning Resources

Deepen your knowledge of the topics presented in this section with the list of web resources (links) below.

Inclusive Design

Inclusive Design Toolkit
Accessibility guide, infographics & design cards from Ontario.ca

Accessible vs. Inclusive Design
Accessible and inclusive design infographic from Toptal.com

Mismatch.design
An online community dedicated to advancing inclusive design

Breaking down accessibility
Adobe Blog post by Matt May explaining accessibility, inclusive and universal design.

Designing for Accessibility & Inclusion
Smashing Magazine article exploring the different lenses of accessibility in design

Assistive Technology

What is a Screen Reader?
Axess Labs explains how screen readers are used.

Who uses Assistive Technology?
List of videos from users with lived experiences and their devices.

Alternative Formats

Alternative Formats Explained
A list of alternative formats from the SNOW project at OCADu.

Accessible Formats Explained
A list of accessible formats from aoda.ca

Making information accessible
Tips for making information accessible from Ontario.ca

Representation

Ableism Resources
A collection of resources on anti-ableism from Simmons University.

Disability is Diversity
Psychology Today article discussing ableism and communication.

Disabilities in Advertising
Reflections by Joshua Loebner on how people with disabilities are represented in mainstream media.

IMAGES & GRAPHICS

Foundational Knowledge

As graphic designers we rely heavily on visual elements to communicate our intended messages. When considering diverse audiences, those visuals may be excluded from their experience and they may not be getting the whole story. Audiences who make use of assistive technologies such as screen readers benefit from these visuals when they are supplemented with alternative text (alt text).

In addition to providing access, the practice of writing alt text for all the images and graphics allows for some reflection on the role of these elements in the overall design. Everything in the design should be purposeful and the addition of alt text to all the non-text elements can amplify their meaning for all readers.

Key Terms

Assistive Devices
Tools and technologies which maintain or improve an individual's functioning and independence in society.

Screen Reader
An assistive technology used primarily by the blind & low-vision community to access digital information. These softwares will read the screen content aloud for users.

Artifacts
An image that does not contribute to the understanding of the content and can be excluded from a screen reader user experience.

What is alternative text?

Alternative text is a brief image description that will only be accessed by assistive technologies and will not display in your design. It is intended to be a written alternative to the visual image that a device can read aloud. The written alternative should reflect the content of the image and its intended purpose.

Writing Alt Text

Well written alt text should be complete and concise. In other words, it should briefly describe the image or graphic in a meaningful way. The alt text should be related to the context of the image and what it is intended to convey in the layout.

When describing an image, focus on what is visible and avoid making assumptions. It is recommended to describe: colours, visible emotions such as smiling or crying, the image style (graph, illustration, etc.), the general surroundings and placement of the objects in the image. Avoid being overly poetic, describing out-of-focus elements or obvious details such as 'a car with wheels'.

Although alt text does not have a prescribed length, it is recommended to keep it short, 125 characters or less.

Adding Value

A picture may be worth a thousand words but we need to be more concise when creating text alternatives! Images and graphics can be supplemented not just with alt text but also image descriptions and captions to provide additional information when needed.

- **Alt Text**
  A brief description focused on the most important details of the image. This text is not visible in the layout.

- **Image Description**
  A detailed explanation of an image describing all the components, typically starting from the top left corner to the bottom right. Useful for complex images or describing artwork. This text is not visible in the layout.

- **Captions**
  A brief description of the image that does not focus on the visual aspects. This text is visible in the layout and is not a replacement for alt text.

Knowing your Images

Not all the visuals in a design serve the same purpose. As the designer, you are the expert in why certain graphics are used and the role they play in communicating the message.

Images and graphics can be categorized in the following ways:

Informative Images
These images play a role in understanding the content of the design and therefore require alt-text.

Decorative images
These images only add value to the visual representation of the design and therefore do not require alt-text. They should be tagged as artifacts

Functional Images
Icons that represent an action like an envelope to indicate an email link require alt text.

Complex images
Visual that are rich in information such as graphs or maps. These types of visuals may require a more detailed image description

Errors to Avoid

Some images are inherently informative, even if they are not part of the main text. Here are some examples:

Logos: This type of image always requires alt text and should include the full company name.

Images of Text: Illustrative type techniques or images of signage have text that is embedded in the image. These images always require alt text that reflect the words in the image.

Alt Text Best Practices

- Consider the purpose of the graphic (content vs. decorative)
- Be concise, 1-2 sentences at most
- Don't use 'Picture of' or 'Image of'
- Be descriptive but stick to the context
- Don't make assumptions about gender, age or race
- Informative images must have alt-text
- Decorative images can be tagged as 'artifacts'

Classroom Discussion

a) Alt Text for Art Pieces

Writing appropriate alt text can sometimes be challenging since images are nuanced and provide a lot of visual information that can be difficult to reduce to a few words. Museums and galleries are regularly faced with the challenge of describing artwork, often without any input from the original artist. Interpreting art can be a very individual experience and museums and galleries struggle to establish a standard. Let's explore a real world example and how they approach alt text.

The Museum of Contemporary Art in Chicago has taken a unique approach to alt text on their website. Since 2018, they have made the alt text on all their images available to visual and non-visual users in an effort to prioritize accessibility while also offering added value to the artwork on their website. In addition, opting to make the alt text visible provides an exemplary model for other art institutions since it is typically hidden in the back end — only accessed by a screen reader.

You can visit the museum's website and see how the alt text is written and displayed at www.mcachicago.org.

You can also read a related article describing the issues museums and galleries face at www.artnews.com.

Discussion Questions:

- When writing alt text for art pieces, what do you think gets lost in translation?
- How would you approach writing alt text for a fine art piece?
- Who is responsible for writing the alt text? Should the artist write it, the designer or the web developer?

Screen capture from MCAchicago.org of Ad Minolit's, Drag King Mural, 2019

Suggested Assessments

1. Formative:

Accessibility Related Learning Outcomes

- Identify images that require alternative text
- Interpret the context of the image in the layout
- Create suitable alternative text for the required images

Assignment Brief :

- Provide students with a PDF layout such as a newsletter, an editorial layout or the excerpt of a report that includes several images.

- Students will be required to create meaningful and concise alternative text for all the informative, functional and complex images in the provided layout.

Deliverables :

- Option A - Students can provide a written document identifying the images and their suggested alternative text.

- Option B - Students can add their suggested alternative text to the native file of the provided layout. This option will require the students to either create the layout in In Design or have access to the INDD file.

- Option C - Students can add their suggested alternative text to the provided PDF using Adobe Acrobat. DC.

Inclusive Design Factors

1. Students will consider the meaningfulness of their alt text.
2. Students will be mindful of the assumptions they make when writing alt text.
3. Students will evaluate the context of the image in the layout.

2. Summative:

Accessibility Related Learning Outcomes

- Identify the critical components of the layout for a non-visual reader.
- Create meaningful alt text for the required images in the layout.
- Produce an accessible PDF.

Assignment Brief:
Local grocery stores will advertise their specials on a weekly basis, typically in printed flyers. In print only, this information is not accessible to everyone and a digital alternative is needed.

- Students will design an accessible PDF version of the grocery store flyer featuring weekly specials and promotions.

Deliverables:

- Students will design a double sided, single page flyer for a fictional grocery store that will feature grocery images, descriptions and prices.
- All of the text in the flyer needs to be dynamic and all the informative, functional and complex images require alt text.
- Students will export their grocery flyer as an accessible PDF.

Technical Skills

A simple accessibility technique that can be introduced to students early on is the addition of alt text to the images and graphics in their designs.

Here are a few examples of how it can be added to Adobe Creative Cloud files.

a) Adding alt text in Adobe InDesign

Custom alt text can be added to graphics through the Object Export Options.

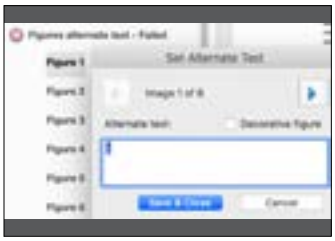
When exported to PDF, the alt text will be included.

Tutorials:
Creative Pro: How to Add Alt Text or Artifact an Image

Adobe Accessibility Overview

b) Adding alt text in Adobe Acrobat

If a PDF is exported without alt text, it can be added by running an Accessibility Check and selecting 'Fix' for the figures that fail.



Tutorials:
Using the Accessibility Checker

PDF Accessibility Repair

c) Adding alt text in Adobe Bridge

For an efficient workflow, alt text can be added to a library of images by adding a 'Description' in the File Info.

Tutorials:
Adobe Accessibility Overview

This can then be accessed in Adobe InDesign using the Object Export Options.

Additional Learning Resources

Deepen your knowledge of the topics presented in this section with the list of web resources (links) below. Although many of the resources discuss alt text in the context of web design, they are still applicable to graphic design.

Alternative Text Basics

Alternative Text
A detailed introduction to alt text from WebAim.

Designing Great Alt Text
A thorough introduction to alt text from Deque.com

Writing Alternative Text

Alt Text Best Practices
A comprehensive list of tips for alt text from Siteimprove.com

Writing Alt Text
Best practices from Perkins School for the Blind.

Writing Alt Text for Data Visualizations
Tips for writing alt text for complex images.

Using Alternative Text

A Lived Experience Perspective
Article and video on how alt text supports blind users by Thinking Out Loud.

Screen Reader Experience
Using a screen reader for one day from a sighted person's perspective from Smashing Magazine.

WCAG 2.0 - Perceivable

Compliance Guideline
The perceivable guideline from the WCAG 2.0 which outlines the requirement for alt text.

COLOUR & CONTRAST

Foundational Knowledge

Colour is one of the fundamental design elements that help designers create focal points and lead the viewer's eye. We use color to create moods, create psychological impact and harmony in our creative work. When we consider accessibility and inclusive design it's important to recognize that the perception of colour is not universal. Colour deficiencies affect approximately 8% of men and 0.5% of women[1] and can result in the misunderstanding of information if insufficient tonal contrast is used.

Colour contrast is an important consideration for typography since it directly relates to legibility. It is also a key factor in designing effective charts, graphs and maps to ensure the visibility of all the components.

1 Sourced from www.colourblindawareness.org

Key Terms

Print Disabilities:
A learning, physical or visual disability that can lead to experiencing barriers accessing conventional printed materials.

Low Vision:
Uncorrectable vision loss such as macular degeneration or glaucoma. Other terms include 'partially sighted' or 'legally blind'.

Cognitive Disabilities:
A spectrum of disabilities defined by limitations in mental functioning and in communication and social skills.

Colour Deficiency:
A more accurate term for colour blindness.

Colour Perception

It's important to acknowledge that every sighted person will perceive colour, shapes and patterns in their own way. The physiology of our eyes and the receptors in our brain are key factors in how we perceive and interpret what we see. Most people who are color blind can see some colours. They can perceive a reduced spectrum which makes them colour deficient rather than blind. Typical color vision can perceive up to 100 hues where some color deficient vision can perceive only 20 hues. There are several types of color deficiencies such as:

- **Red-Green Blindness:** Red and Green hues are not perceived and cannot be distinguished from one another. This is the most common colour deficiency.

- **Blue-Yellow Blindness**: Blue hues will be perceived as green and yellow hues will be perceived as violet. This colour deficiency is rare.

- **Achromatopsia:** No colour hues can be perceived, the person sees the world in greyscale. This colour deficiency is also rare.

Colour Contrast Ratio

Colour contrast ratio is a benchmark we can use to ensure that foreground elements are perceivable against their backgrounds to all readers. Although typically used in web design, it is equally applicable to digital and print design.

The contrast ratio is contrast is a measure of the difference in perceived 'luminance' or brightness between two colors. This brightness difference is expressed as a ratio such as 21:1 for black text on a white background.

Suggested colour contrast ratio is:

- 4.5:1 for small text (eg. body copy)
- 3:1 for large text (eg. titles, headings)

These ratios can be difficult to eyeball and several web based tools have been developed to assist designers in testing their colour choices.

In considering access and inclusion at the onset of a project, test contrast ratios early to establish colour palettes and suitable foreground/ background combinations that will support the accessibility of your design.

Text on Images

Text over background images, gradients or transparent elements must still adhere to the color contrast ratio. These can be harder to measure since the foreground is not a single hue. It is recommended to use the lightest background hue to test against.

Strokes and outer glows can improve the contrast ratio but may not always complement your design.

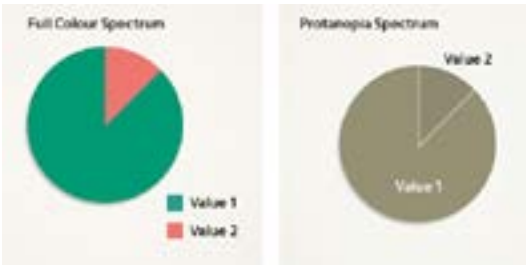
Using Colour Cues

In addition to choosing accessible colour palettes we also need to be mindful about our reliance on color based cues. While color can be useful convention to quickly classify elements on a page, don't forget that some readers may not be able to distinguish between them. A classic example is the use of green to indicate a correct answer and red to indicate an error. Without a complementary icon or text label, these cues may not be clear to some viewers and could cause frustration.

When using colour to indicate emphasis or feedback to the user, consider using icons as a complement to colour cues. Also, in scenarios where color represents a category of a choice, be sure to add text labels to facilitate recognition. You can also consider the use of textures and patterns to supplement the colour cues, such as in a graph. These slight modifications can make the perception of the information in your design available to all users.

Colour Use Best Practices

- Test your colour palette at the beginning and establish style guidelines.
- Validate your colour choices with a colour contrast checker
- Don't rely solely on colour cues — use text labels, textures & icons
- Preview in greyscale — is all the content perceivable?



Example of how the placement of text labels can assist in understanding the information in the graph.

Classroom Discussion

a) Colourblind Friendly Mode at Trello

Screen capture of the Trello interface with Colorblind Friendly

Many digital products use color coding as a quick method to communicate various types of information. This can be challenging for users with color deficiencies but also for those with low vision and cognitive disabilities. Let's explore a real world example and how a small design change improved usability for their customers.

Trello is a web-based, list making app that is useful for managing projects and small teams. In 2014, they added unique textures that can be used in conjunction with color to create a more accessible experience for their color deficient users know as 'Colorblind Friendly' mode.

You can read more about Trello and their labeling features at: www.trello.com.

Understand the impact for color deficient users at: www.wearecolorblind.com

Discussion Questions:

- Can you think of other scenarios where a small design change to color cues could improve usability?

b) Brand Guidelines & Colour Contrast

When working with brand guidelines, it's not uncommon for designers to have to make a choice between meeting the colour contrast ratio or adhering to the brand standards.

Discussion Questions:

- What should take priority, the brand standards or accessibility?
- Should established brands consider revising their identities to meet accessibility guidelines?

Suggested Assessments

1. Formative:

Accessibility Related Learning Outcomes

- Recognize barriers to access in existing design pieces
- Establish a colour palette that meets the required contrast ratio
- Create additional visual cues to support the colour cues

Assignment Brief :

- Provide students with a data visualization such as a pie chart or bar graph. The provided design should have accessibility gaps and should not include text labels, patterns or contrasting colours.

- Students will be required to use the existing information in the provided design and create their own version which considers accessibility.

Inclusive Design Factors

1. Students will consider the presentation of their information and how it could be interpreted by different users.

2. Students should consider the context of the information, not just the aesthetic.

Deliverables :

- Students submit a full colour and greyscale PDF of their data visualization.

- In addition, students can provide a brief rationale for their design choices along with the color palette and calculated contrast ratios.

- If suitable, students could also be asked to provide suitable alt text for the design.

2. Summative:

Accessibility Related Learning Outcomes

- Develop an accessible design system for a complex visual
- Establish a colour palette that meets the required contrast ratio
- Create additional visual cues to support the colour cues

Assignment Brief :

Maps convey a lot of information through colour, texture, shape, proximity, text elements and icons. While maps present obvious accessibility issues for non-visual users, they also can present barriers for people with colour deficiencies, low vision and cognitive disabilities.

- Students will design a map of their neighbourhood that will consider accessibility for users with print disabilities.

Deliverables :

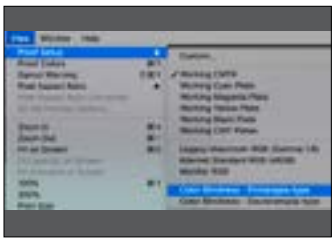
- Students will design an 8.5 x 11, full color map with major streets and important landmarks.
- The maps can be stylized and don't need to be to scale but should have enough information to be useful.
- In addition, students can provide a brief rationale for their design choices along with the color palette and calculated contrast ratios.

Photo by Gotta be Worth it on Pexels

Technical Skills

a) Colour Proofing in Adobe CC

Adobe Photoshop and Illustrator have soft proofing filters that simulate color blindness.



Tutorials:
Soft proofing in Photoshop

Soft proofing in Illustrator

b) Colour Contrast Checkers

Web based contrast checkers can calculate the color contrast ratio of foreground and background colors based on their HEX values.

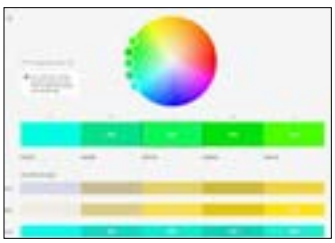
Tools:
Colour Contrast Analyzer

Web Aim Contrast Checker

Text - Image Contrast Checker

c) Adobe Color Accessibility Tools

Adobe Color features accessibility filters that will indicate low contrast color combinations. It will also preview the colors with colorblindness filters.



Tutorials:
Using Adobe Color

Building Themes

d) Accessible Color Palette Tools

These web based tools will make colour recommendations that meet the contrast ratio based on a starting foreground or background colour.

Tools:
Colorsafe.co

Toolness

Accessible color generator

Additional Learning Resources

Deepen your knowledge of the topics presented in this section with the list of web resources (links) below. Although many of the resources discuss colour in the context of web design, they are still applicable to graphic design.

Colour Deficiency

Color Blindness Basics
Understand the experience of people with colour deficiencies. This resource also has a colour blindness simulator.

Experience Colour Blindness
An advocacy group describing the experiences of people with colour deficiencies and their common barriers at colourblindawareness.org.

Wearecolorblind.com
A site dedicated to making the world a better place for the colour blind by colour blind graphic designers.

WCAG 2.0 - Perceivable

Compliance Guideline
The perceivable guideline from WCAG 2.0 which outlines the minimum requirement for colour contrast.

Accessible Colour

Colour Contrast Basics
The importance of colour contrast explained.

Effective Colour Contrast
A PDF guide on designing for people with partial sight and colour deficiencies.

Colour Contrast Ratio
Colour contrast ratio explained by WebAim.

Contrast Ratio for Data
Article outlining colour best practices for data visualization by Zach Grosser.

Colour Contrast Tools
A comprehensive list of accessible colour tools from digitalA11y.com

Colour Accessibility Resources
A collection of tools and resources to help designers make accessible colour choices from Stephanie Walter.

TYPE & STRUCTURE

Foundational Knowledge

Legibility, readability and the logical structure of information are essential factors for good communication design, even more so when we consider accessibility. Much like colour contrast, accessible typography considers readers with print disabilities while the structure of the document supports assistive technology users. As designers, the choices we make in the construction and presentation of our documents can have an impact on how easily information can be perceived and understood which ultimately benefits everyone. Given that reading is not linear and dependent on recognizing shapes, good typographic choices can reduce cognitive load and makes the content more approachable. Clear hierarchy also contributes to the legibility and readability for both visual and non-visual readers. Fundamental typographic principles and page layout best practices already support accessibility by encouraging easy-to-read content however there are a few special considerations to ensure that our communication is as accessible as possible.

Key Terms

Readability
Refers to how quickly a sighted person can read and comprehend a text.

Usability
Refers to how easy a digital document is to navigate for both sighted and non-sighted users.

Clear Print
Any printed material that is accessible to everyone.

Large Print
Printed material that is created specifically for the low vision community.

Content Tagging
Adding invisible tags to the text to assign semantic roles for PDF exports.

Font Selection

When selecting a typeface there are many factors to consider such as the audience, key messages and tone of your design. When considering accessibility, there are a few key features to look for in your typeface choice starting with serif vs. sans serif. Although there is much debate about the accessibility of one over the other, research on the topic has been inconclusive. Both serif and sans serif typefaces can support readability for users with print disabilities as long as they have easily distinguishable letter forms.

It is recommended to select typefaces with open counters and obvious ascenders and descenders. Avoid typefaces with ambiguous letter forms, ensuring each letter is unique and easily identifiable. A good practice is to compare the lower case 'l' , uppercase 'i' and the number '1'. Typefaces that have distinct shapes for each glyph assist the reader in recognizing words to improve readability. In addition, avoid typefaces that use mirrored letter forms for lowercase 'b' and 'd' or 'p' and 'q' as they can cause confusion for some readers with cognitive disabilities.

Typefaces with proportional spacing are recommended since the variability contributes to distinguishing letter forms. Condensed font styles may be harder to distinguish individual letters due to the narrow set widths and should be used sparingly.

Type Styling

Type size for accessibility is another controversial topic with many guidelines suggesting specific point sizes. The size of the text to support legibility and readability is dependent on many factors such a font choice, color contrast, context, etc., which is why accessible type sizes can't be reduced to a single value. While 12pts is the common recommendation, it is recommended to consider the x-height of your typeface and recognize that taller x-heights will make your type appear larger than what the point size indicates. The goal with accessible typography is

to create 'clear print', a design that is readable by most. On the other hand, large print which is typically set at 16-18pts for body copy, is a format that is a suitable alternative that is specifically designed for the low vision community.

In addition to type size considerations, other styling factors that can disrupt readability is the overuse of italics, bold and underline. Avoid using these type styles for paragraphs of text although they can be suitable for 1-2 lines. Extensive use of all caps can also disrupt readability since the letter forms are typically uniform in height. Again, all caps can be suitable for 1-2 lines but is not recommended for paragraphs.

Typography Best Practices

- Select fonts that have distinct letter forms.
- Avoid using all caps, italics and underlines for paragraphs.
- Short line lengths and text in columns is preferred.
- Left aligned and horizontal text is preferred.
- Use the recommended color contrast ratio between text and the background.

Lastly, when using all caps, be sure to use the character styles to change the display rather than typing in capital letters. For screen reader users, consecutive capital letters can be interpreted as an acronym and can confuse the reader.

Layout

All the design elements play a factor in the success of the layout communicating clearly to all users. That being said, accessibility does have some specific considerations that can enhance the experience for everyone. With regards to page layout, one of these considerations is the use of white space and text spacing. For accessibility it is recommended to use generous leading and adequate spacing between paragraphs. Having a distinct break between paragraphs and lines of text helps the reader orient themselves in the text which assists in comprehension. For body text, it is preferred to use left alignments on horizontal text. The consistent left edge assists people with print disabilities find their place when reading multi-line paragraphs. For lengthy content, it is recommended to use columns since it creates shorter line lengths and reduces the need to use peripheral vision.

When planning the page, keep in mind that not all users will view your layout at 100%. Many people in the low vision and senior communities make use of magnification software such as Zoom Text Magnifier to enhance the size of digital documents. These softwares will enlarge segments of the page up to 400%. Proximity is a key layout principle in keeping like items together to support screen magnification users. As much as possible, try to keep like content in a single column to improve the usability and comprehension of the content.

Clear visual hierarchy is also an important layout consideration for accessibility. The use of headings and sub-headings helps break up the content which improves readability by adding more white space on the page. For non-visual users, hierarchy also plays a role in how they navigate the information in the form of content tagging. When planning a layout, ensure consistent structure to the information and a logical order to the hierarchy.

Common Content Tags

P: Used for any text that is not a heading, so paragraphs.

H1: Used for the title of the document , section or chapter.

H2: Used for sub-headings and should follow an H1. There can be multiple H2 on a page.

H3: Used for a sub section of H2. There can be multiple H3 on a single page.

H4-H6: Sub sections of H3, typically only used in very complex hierarchies.

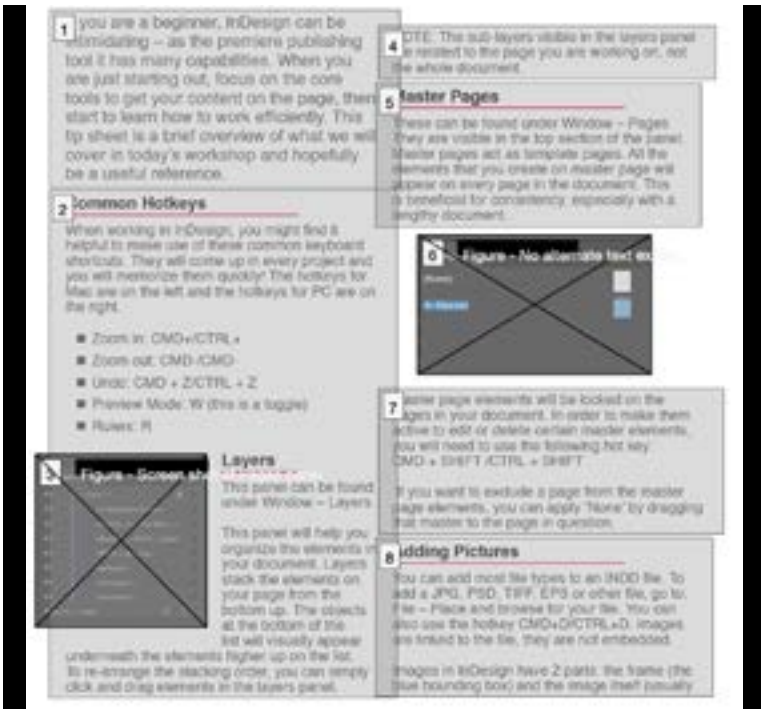
Content Tagging

The hierarchy of the information is visually displayed through spacing and typographic choices. This visual hierarchy allows most readers to quickly 'skim' the text for relevance and gain a brief understanding of what is addressed in the text. Screen reader users also want to 'skim' the content but without content tagging all the text elements play the same role in the content. Content tagging refers to assigning a semantic role to the text such as headings and subheads so that non-visual users can navigate through the structure of the information. In the same way that a sighted reader can scan the headings, screen reader users can use their software to sort heading levels, lists and hyperlinks to focus on the content that is most relevant to them.

The content tags can be assigned in the native document but become usable in the exported document, typically a PDF. A tagged PDF will include the semantic structure of the document as an invisible layer that is only accessed by screen readers. Most authoring softwares will assign content tags for elements such as tables, lists and images but the tagging of the body text is nuanced and cannot be done automatically. Much like alt-text, the role that a piece of text plays in the layout must be assigned by the designer. Assigning heading levels and identifying text that is decorative such as some header and footer text which requires an understanding of the content and its components.

Reading Order

In addition to tagging the structure of the text elements for non-visual users, it is equally important to indicate the intended reading order. While our visual design will lead the eye through the content and create clear focal areas. However, this is not the experience for a screen reader user. Establishing the reading order of the elements on the page will support a non-visual user in experiencing the intended flow of the information. Assigning a reading order to the text, images, pull quotes, tables and such lets the screen reader know when to present the non-text elements to the user. Without establishing a reading order all the images may be presented after all of the text in which case they may no longer have value in understanding the content. Reading order can be established through the layers panel but also how and the order in which the document elements are added play a role in how the screen reader will interpret the reading order.

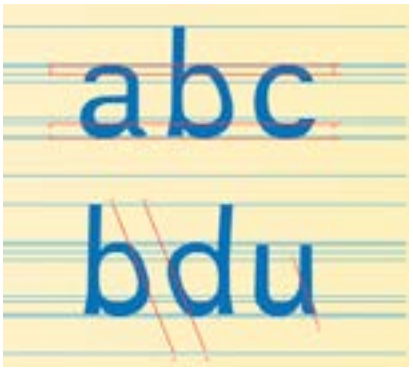


Screen capture of Adobe Acrobat reading order display on a PDF.

Classroom Discussion

a) Specialty Fonts

Typography plays such an important role in accessing information, especially for people with print disabilities. Some type designers have embraced an inclusive design approach and in consultation with people who have lived experience, have designed typefaces specifically for atypical users.



Sample letters of Dyslexie font.

A great example of a specialty typeface is the Dyslexie font. Christian Boer, a designer with dyslexia, wanted to design a font family that improved the reading experience for those with cognitive disabilities. When designing, he ignored typical type design principles and focused on the barriers that people with dyslexia face when reading.

You can read more about the Dyslexie font at: www.dyslexiefont.com

Sample letters of Atkinson Hyperlegible font.

Another example of a specialty font is the Atkinson Hyperlegible font designed by Applied Design Works for the low vision community. This typeface focuses on distinguishable letter forms to aid in comprehension.

You can read more about the Atkinson Hyperlegible font at: www.brailleinstitute.org.

Discussion Questions:

- When do you think it's suitable to use specialized accessible fonts?
- Should our approach to typography be more universal?
- Can you think of other typefaces that have similar qualities to the specialized accessibility fonts?

Suggested Assessments

Short intro

1. Formative:

Accessibility Related Learning Outcomes

- Identify a suitable font family that supports accessibility
- Establish a logical and consistent hierarchical structure
- Tag text content and export a tagged PDF

Photo by Daria Shevtsova on Pexels

Assignment Brief:

- Provide the students with plain-text copy for a single page restaurant menu.
- Ensure that the copy includes a few categories, food items, descriptions and prices.
- Students will design the menu and select typefaces, create a visual hierarchy and lastly, prepare an accessible PDF.

Deliverables:

- Students will design the menu in Adobe InDesign using the provided copy.
- Students will need to make use of paragraph styles to add the 'Export Options' for content tagging.
- Students will also export a tagged PDF and test for accessibility in Acrobat DC.

2. Summative:

Accessibility Related Learning Outcomes
- Establish a logical and consistent hierarchical structure
- Arrange the reading order for screen reader users
- Tag text content and export a tagged PDF

Assignment Brief:
Product catalogues are a good example of layouts that make use of many of the necessary accessibility features with regards to typography and reading order. The imagery needs to be relates to the text which needs to be organized in a logical way to display the product name, description, options and prices.

- Provide students with plain-text copy for a 4 page product catalogue. Examples of suitable topics that require descriptions would be a furniture catalogue, kitchen appliances or hand tools.

- Students will design the multi-page catalogue by selecting suitable typefaces, creating clear visual hierarchy and establish a logical reading order for the content.

Deliverables:
- Students will design the catalogue with accessibility in mind and will produce an accessible PDF with alt text, logical reading order and content tags.

Inclusive Design Factors

1. Students should consider the flow of information in their catalogue while considering readability and legibility for all users.

2. Students will need to consider how the placement of the product image and text description will be perceived if magnified.

3. Students will need to consider the distribution of the product catalogue and how different users will access the information.

Technical Skills

a) Content Tagging in Adobe InDesign

Custom export tagging can be added to headings and paragraphs using the paragraph styles.

When exported to PDF, the tags will be included.

Tutorials:
Mapping Styles & Tags

How to work with Export Tags

b) Export a Tagged PDF from Adobe InDesign

Exporting a tagged PDF will embed all your alt text, content tags and defined reading order in the final document and reduce the amount of PDF remediation needed to make it accessible.

Tutorials:
Exporting PDF tags from InDesign

c) Reading Order in Adobe InDesign

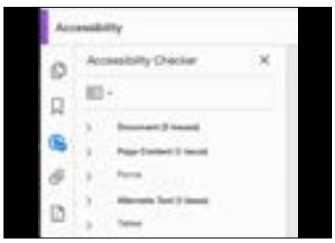
Using the Articles panel in InDesign the reading order can be assigned to blocks of content.

Tutorials:
Defining reading order

Using the Articles panel

d) PDF Accessibility Checker in Adobe Acrobat

Once a tagged PDF has been exported, it can be verified and remedied in Adobe Acrobat.



Tutorials:
Using the Accessibility Checker in Acrobat

Additional Learning Resources

Deepen your knowledge of the topics presented in this section with the list of web resources (links) below.

Accessible Typography

Accessible Typography Basics
An introduction to accessible typography and fonts from WebAim.org.

Accessible Type Guidelines:
List of accessible typography myths from Apastyle.org

Choosing accessible typefaces
Tips on selecting accessible typefaces from the Readability Group.

The Readability Group
A collection of articles focused on accessible typography.

Clear Print Guidelines

Clear Print Guide
PDF of the guidelines from the CNIB (Canadian Institute for the Blind).

Guidelines for Legibility
PDF of 10 tips for increased legibility for low vision users from Lighthouse International.

Accessible Page Layout

Semantics & Reading Order
A quick overview of how reading order and tags support accessibility.

User Perspectives
Videos describing the benefits of clear layout and design from a users with lived experience.

Low Vision Experience
Types of low vision explained and a video of screen magnification software.

Accessible PDF

Overview of PDF Tags
A brief overview of content tagging.

PDF Techniques for WCAG 2.0
Summary of techniques to create accessible PDFs.

How to Make Accessible PDFs
PDF accessibility guide by Kris Rivenburgh.

Create Accessible PDFs
Lynda.com tutorial on creating accessible PDFs.

SUMMARY

As design educators, it is our responsibility to equip our students with marketable design competencies that they can continue to build upon throughout their careers. Acknowledging that accessible and inclusive design is an emerging practice paired with the upcoming legislative compliance deadlines of the AODA and similar legislation in other jurisdictions, it is evident that this is an ideal time to incorporate these concepts into our design curriculum.

The guide is designed as a living document and an introductory resource to supplement your existing curriculum. While there is so much to discuss, accessibility and inclusion are a journey that begin with a few steps. By incorporating accessibility and inclusion into our existing design curriculum, design educators will be cultivating the next generation of inclusive graphic designers who will positively impact the industry and society.

If we touch on accessibility in all of our courses throughout their entire program, students will understand that access and inclusion are core considerations for graphic designers. If we do this as a team, it will have long lasting impact.

ABOUT THE AUTHOR

Jennie Grimard is a design educator at Humber College in Toronto, Canada. She is the Program Lead for the Graphic Design for Print & Web program, a member of Humber's AODA committee and she facilitates corporate training workshops in accessibility and inclusive design for in-house graphic design teams. She recently completed her Master's in Inclusive Design at OCAD and is an active voice in advocating for accessibility as a learning outcome for media programs at Humber College through her continued work on **Making Accessible Media**, an open access course on media accessibility for all faculty and students.

People ignore design that ignores people.

— Frank Chimero —