ACCESSIBILITY

INTRODUCTION

The internet connects people to information and to each other. However, the digital world, like the physical world, is not inclusive of everyone. There are many barriers that can arise with digital technology, and these affect people in different ways at different times of their lives. Technology inevitably reproduces societal biases, and therefore, content creators should intentionally consider accessibility in the design process. Accessibility is more than a box to be ticked—it is never fully achieved but rather continuously improved.

Accessibility refers to practices that ensure everyone can access and interact with digital content, regardless of their physical capability, neurodiversity, or socio-economic status. People encounter barriers when content isn't designed for the different ways that they can interact with technology. For example, people with blindness, low vision, and colour blindness cannot access some Visual information or content that is navigated Visually. Information presented only in an audio format is not accessible to people who are partially or completely deaf. Technology that works only through the use of a mouse, for example, is not accessible to people whose mobility or dexterity requires other tools like keyboard shortcuts or speech-activated commands.

In addition to physical challenges, geographical location and socio-economic status pose barriers to digital information access. The term *digital divide* is used to describe the gap between people who have access to internet and other digital technologies and those who do not.

Video: A Personal Look at Accessibility in Higher Education

Description: YouTube video made by GOALSatNCDAE describing the difficulties that staff and students face in a university when accessing information online. Video captions included.

ACCESSIBILITY GUIDELINES AND BEST PRACTICES

Since webpages are by far the most common way that people interact with digital information, web accessibility is crucial.

There are three fundamental guidelines to follow when designing webpages:

1. Web content should be designed in accordance with regulations such as: the Web Accessibility Guidelines and the Web Content Accessibility Guidelines (WCAG 2.0) published by the World Wide Web Consortium.
2. All information should be presented with more than one access option, for example, text should also have an audio option for visually-impaired users.
3. Users must be able to operate the accessibility tools built into the relevant software or on their own device.

Here are some best practice tips when designing a webpage or other digital content, such as documents and presentation slides:

- Don't rely only on colour to tell a story. Give explanations as well. If it's essential to use colour, make sure the contrast is high.
- Include a voice recognition option.
- Have a good layout, including clear headings, navigation bars, and consistent styling.
- If there are links inserted on the webpage, make the font size of the link bigger for mobility-challenged users.
- Give an option to adjust the font size of the webpage.
- Always include accurate captions for videos.
- Avoid using animation, but if necessary, include a warning, because some animations trigger epilepsy.
- Ensure the content is accessible without a mouse.
- Avoid using videos and graphics that take a long time to load, as these might be inaccessible to those with unreliable or slow internet connections.

DIGITAL DIVIDE

The digital divide refers to the split between the population who can access information via computers and smart phones, etc. and those who cannot. Originally, the term merely referred to internet access, but now, it is an umbrella term covering gaps in accessing internet infrastructure, applications and services.

The digital divide has never been so evident as during the COVID-19 pandemic. When the world went into lockdown, the importance of access to technology was clear. The advantaged population

continued to conduct their lives in an alternative way during the isolation, through telemedicine, video conferences, virtual classrooms, online shopping, etc., while others couldn't, exacerbating the gap already created by the digital divide.

There are several factors contributing to this inequity: local infrastructure, economic status, race, gender, physical and mental ability, and age.

The impact of the digital divide is enormous and increases over time, going beyond inequity in accessing technology to include economic and social consequences and barriers. Governments and non-government organizations have a role in taking action to build infrastructure where it is lacking and fund libraries and other institutions that promote digital literacy and connect people with technology.

factors contributing to the

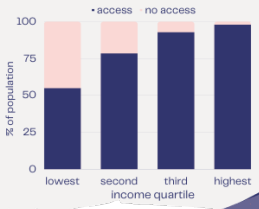
DIGITAL DIVIDE

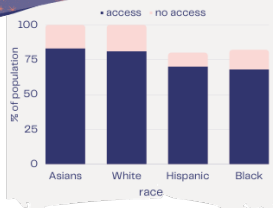
local infrastructure, economic status, race, gender and age

Income

In the US, households with more than $100k in income are twice as likely to own multiple devices and have high-speed internet compared to households making less than $30k

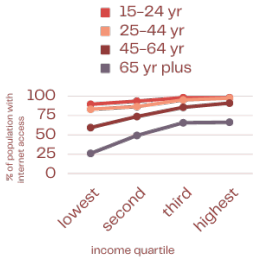
In Canada, access to the internet increases linearly as income goes up. Those with incomes in the lowest quartile have the least internet access.





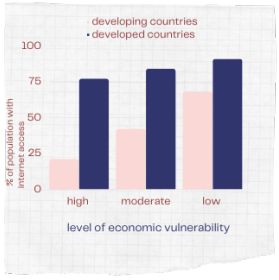
Race

In the US, home internet access rates differ among different ethnicities. Asians and whites have the highest internet access rates. The number drops to 70% and 68% in Hispanic and Black homes.



Age

Age is correlated with home internet use. In Canada, regardless of income, elder individuals spend less time using the internet. People who are over 65 years old have significantly less internet use.



Worldwide

Globally, internet access rates depend on the economic development of the region. In more developed countries, even people with high economic vulnerability have much higher internet access rate compared to developing countries. This is largely because developed countries provide better local infrastructure.

Infographic description

Title: factors contributing to the digital divide: local infrastructure, economic status, race, gender and age

Income:

In the US, households with more than $100k in income are twice as likely to own multiple devices and have high-speed internet compared to households making less than $30k.

Figure shows 16 laptop icons. 4 out of the 16 are coloured with light pink to represent that households with less than $30k income are twice as less likely to own multiple digital devices compared to households with more than $100k in income.

In Canada, access to the internet increases linearly as income goes up. Those with incomes in the lowest quartile have the least internet access.

The bar graph indicates that households with different income quartiles have various levels of internet access. The households with the lowest income quartile have the least access to the internet, 54.9% of the population in this quartile can access the internet, versus 97.85% people in the highest income quartile. The percentage of population that can access the internet in the second and the third income quartile are 78.45% and 92.68%, respectively.

Race:

In the US, home internet access rates differ among different ethnicities. Asians and whites have the highest internet access rates. The number drops to 70% and 68% in Hispanic and Black homes.

The bar graph demonstrates the percentage of the population with internet access according to race. Asian and white households have the highest level of internet access, 83% and 82%, respectively. Hispanic households rank third with 70% of the population having internet access. Black households have the least internet access at 68%.

Age:

Age is correlated with home internet use. In Canada, regardless of income, elder individuals spend less time using the internet. People who are over 65 years old have significantly less internet use.

The line chart shows that different age groups in different income quartiles have various degrees of internet access.

The red line represents people aged 15-24 years old. The percentage of population in this age group with internet access are: 89.5%, 93.5%, 98%, 98%, from the lowest to the highest income quartiles.

The orange line represents people aged 25-44 years old. The percentage of population in this age group with internet access are: 83.1%, 86.5%, 95.1%, 97.4%, from the lowest to the highest income quartiles.

The burgundy line represents people aged 45-64 years old. The percentage of population in this age group with internet access are: 59.5%, 73.7%, 85.6%, 91%, from the lowest to the highest income quartiles.

The grey line represents people aged 65 years old or above. The percentage of population in this age group with internet access are: 26.3%, 49.4%, 65.7%, 66.4%, from the lowest to the highest income quartiles.

Worldwide:

Globally, internet access rates depend on the economic development of the region. In more developed countries, even people with high economic vulnerability have much higher internet access rate compared to developing countries. This is largely because developed countries provide better local infrastructure.

The bar graph indicates the level of internet access for people with different economic vulnerability in both developed and developing countries.

The percentage of population that can access the internet in developed countries are 77%, 84%, 91%, corresponding to high, moderate and low economic vulnerability.

The percentage of population that can access the internet in the developing countries are 21%, 42%, 68% corresponding to high, moderate and low economic vulnerability.

QUIZ

Which of the following are NOT some important practices to ensure that digital content is accessible?

A. For websites, follow the Web Content Accessibility Guidelines (WCAG 2.0)
B. Use bright colours like red and green to differentiate data on graphs and charts
C. Make sure that the content can be accessed through keyboard shortcuts
D. Include text-only versions of any Visual content such as images, graphics, and videos that can't be read by a screen-reader

Correct answer: B

Feedback: Red and green are indistinguishable for some colour blind individuals. All of the other practices listed are important to ensure accessibility.

ACTIVITY

Purpose: This activity gives you an opportunity to try accessing the web pages that you usually visit in a different way.

Task: Use the list of keyboard shortcuts supported in Chrome or Firefox to do your daily online tasks, such as browsing social media, checking email, or online shopping. Think about: Are there any sites that don't work well? Can all the sites be used without a mouse?

Time: This activity should take about 10 minutes to complete.

ACTIVITY

Purpose: For you to learn more about the digital divide in Canada.

Task: Read "How COVID-19 worsens Canada's digital divide" and reflect on what are the contributing factors of the digital divide. Do you think that the Canadian government's strategy of investing in broadband infrastructure as described in the article will be successful to allow 100% of Canadians to connect to the internet by 2030? Respond to the poll to see what others think.

Time: This activity should take about 5 minutes to complete.

CONCLUSION

Digital technology and information should be for all people, regardless of their devices, languages, location, gender, race, or income. Accessibility should be a fundamental goal when designing digital content keeping in mind the different ways that people interact with and perceive the world.

REFLECTION

Let's reflect more on some facets of digital accessibility.

Task: Write approximately 200 words about what you've learned about barriers that people might face when using digital technology and how they might overcome them.

Time: This reflection should take about 10-15 minutes to complete.

FURTHER RESOURCES

Webpage: Digital Divide

Investopedia article from 2022 that defines the digital divide and explain what is being done to close it in the US and worldwide.

YouTube Video: Technology, the power and the promise

24-minute talk about the potential of technology to change people's lives regardless of their abilities.

Udemy Course: Introduction to Web Accessibility

Learn web accessibility and apply best practice WCAG 2.1 accessibility patterns and techniques to your websites.

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S. Derek Turner. Digital Denied: The Impact of Systemic Racial Discrimination on Home-Internet Adoption. Free Press, December 2016.

Emily A. Vogels. Digital Divide Persists Even As Americans With Lower Incomes Make Gains in Tech Adoption. Pew Research Center, 2021.

VIDEO TRANSCRIPT

Things for Digital Knowledge. Concordia Library.

Jingjing Li, student librarian

Intro slide: Concordia library logo

Interviewer: I've heard of the idea of accessibility being an important part of equity, diversity and inclusion in society. What do people mean when we're talking about accessibility in digital environments? [question displayed on the screen]

Jingjing Li: That's a good question. It's an issue that we notice with the wide use of the internet. As you know, the internet connects people to people, to information, but it's not always that accessible and inclusive. Just like the physical world. In the physical world, we make things easier for people with different level of abilities. For example, we build a curb cut for people who use wheelchairs. And there are tactile pavements for people who don't see well. It should be the same in the digital world. And that is what accessibility means.

Visual slides text: online information for everyone

Visual image description: curb cut

Visual image description: tactile pavement in metro

Interviewer: Why is that important? [question displayed on the screen]

Jingjing Li: Well, everyone should be able to access the same information online and have the same experience. People have difficulties browsing information online, for different reasons, it can

be temporary or permanent. For example, when colour blind people see a graph distinguished only by colour, all the data look the same.

Visual image description: a line chart shows two lines with identical colour but different data. Slide text: what colour blind individuals see

Jingjing Li: And when someone breaks their arm in the winter, and you try to click the link on the website, with a mouse, it is difficult, and there are many cases like that.

Interviewer: Wow, that's a challenging situation. If there's something we can do to help? [question displayed on the screen]

Jingjing Li: Oh, there are plenty of things we can do. Just a few tips. For example, when you do a graph, just make sure the data are distinguished by different shapes. And you can also write the caption right next to the data. Just do not only rely on colour.

Visual: two pie charts displayed on the screen; one shows four sections with different colour to indicate how people with typical vision see data distinguished by colour only. Another pie chart only has grey colour to indicate how colour blind people see such data. Slide text: use shapes, different shapes, star, triangles, etc.

Jingjing Li: Of course, designers of digital information need to make sure that all content can be accessible by keyboard without mouse. And all content should have different ways to convey the same information.

Visual: video clip shows a keyboard shortcut Alt+Tab to switch between different windows.

Interviewer: What does that mean? [question displayed on the screen]

Jingjing Li: It means, for example, the text should have audio options for people who can't see well. If there's a video, then there should always be captions, for people who don't hear well. For the pictures, there should always be alternative text description. And those descriptions should always come with audio options.

Visual image description: accessible keyboard with LANG and SUBTITLE keys

Interviewer: What else? [question displayed on the screen]

Jingjing Li: Well, there are many things. For example, it's good to have a layout that has different levels of headings. Don't skip headings and don't go back and forth.

Visual slide text: html code for headings, a table shows the html codes for different levels of heading, such as <h1>Heading Level 1</h1>

Jingjing Li: In terms of choosing colour, it is very important to have a good contrast, colour contrast.

Visual image description: how people with normal vision perceive colour and the inaccessible combinations of colours for deuteranopia, protanopia, tritanopia.

Jingjing Li: And this is beneficial for all groups of people. For people with different levels of vision, for the older ones, for people who use their devices under strong sunlight. I'm sure we all have the experience when we check our phone under the sun, you know we'll do this [raises hands to shield eyes from the sun]. And speaking of this, I remember there's a concept called TAP, temporarily abled people, and we're all TAPs. We all age, our bodies change. So there will always be situations that we find things are more challenging than usual. For example, where you're holding a coffee and walking and trying to send a text message, so you wish the letter keys are bigger so you can type faster, while you try to click on a tablet you wish the font of the link is bigger so it's easier to click. Can you imagine a Parkinson's disease patient try to click that link? It can be a lot of trouble. So, after all, a good accessible design is beneficial for everyone.

Visual: two phone screens. The one on the left has small keys, and the one the right has larger keys. This is to indicate webpage design can be made more accessible by using larger icons and buttons. Slide text: Not accessible, accessible.

Visual: Thank you! CREDITS: This presentation template was created by Slidesgo, including icons by Flaticon and infographics & images by Freepik. Music: Lofi Summer Background by Vladislav Kurnikov on Pixabay.