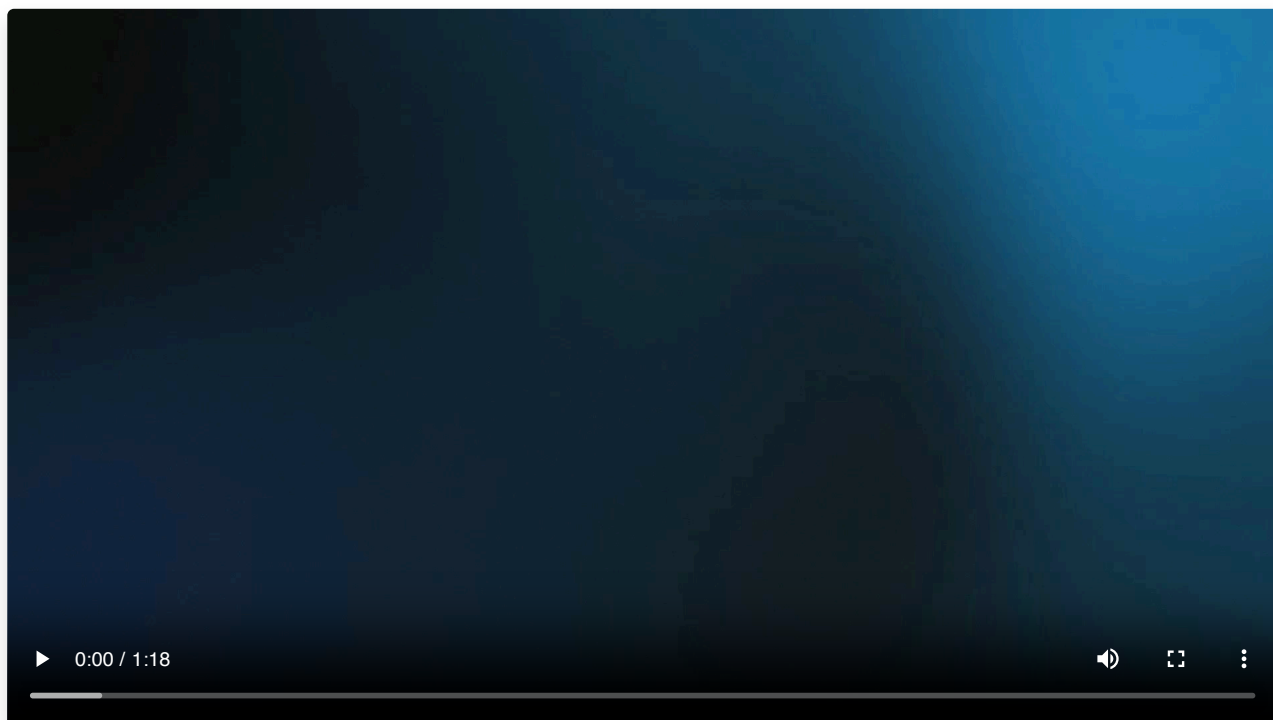


Accessibility

Textbook

Accessibility





When we create computer programs, apps, and websites, it's important to make sure they can be used by as many people as possible. Because software and apps can reach large audiences through the internet, they need to be designed so that people with different needs, devices, and abilities can use them effectively. This is called **accessibility in technology**.

What is Bias?

Bias in design happens when a program reflects only the perspective of its creator, leaving out other users. For example, if you designed a shoe-shopping app, you might only include the shoe styles you personally like. While this isn't harmful, it limits the usefulness of the app for people with different preferences.

In more important areas, like healthcare or education software, bias can create real barriers. That's why programmers and designers need to test their work for a wide range of users and ensure accessibility is built into the design process.

Different Populations to Consider

To improve accessibility, developers consider different kinds of users and the technologies they may use. Some examples:

- **Vision differences** (blindness, color blindness, dyslexia)
 - Use screen readers, text-to-speech, high-contrast modes, and alt text for images.

- **Hearing differences** (deafness, partial hearing loss)
 - Provide captions, transcripts, and visual indicators for sounds.
- **Mobility differences** (missing limbs, wheelchair use, limited hand control)
 - Enable voice navigation, larger buttons, and compatibility with assistive devices.
- **Language differences** (non-native speakers, translation needs)
 - Add translation features and simple, clear text.
- **Learning differences** (different processing styles or needs)
 - Support text-to-speech, adjustable reading speed, or simplified modes.

These solutions are supported by **adaptive technologies**—tools designed to help people interact with software in different ways.

Helping Make Programs Accessible



Let's apply accessibility thinking to the shoe app example:

- **For someone with no arms:** Add voice navigation and make the app work with digital assistants like Siri or Alexa. Provide resizable buttons for easier navigation.
- **For someone who is blind:** Add alt text for all images so screen readers can describe them. Ensure navigation can be controlled by voice or keyboard shortcuts.
- **For someone who speaks a different language:** Include a built-in translation feature so the app is usable in multiple languages.
- **For someone who struggles with word order when reading:** Add text-to-speech so all content can be read aloud. Add in voice navigation so the person can use their voice to navigate the app. Make sure the app works with assistive devices like Siri or Alexa. Make a way for the buttons to get larger so

that the person can use whatever limbs they have to navigate.

Summary

Bias in design happens when programs only reflect the creator's perspective, which can limit usability. Accessibility ensures that apps, websites, and programs are designed to work for the widest possible range of users. By considering vision, hearing, mobility, language, and learning differences—and by using adaptive technologies—developers can build software that is practical, inclusive, and effective for more people.

Questions (10)

1. True or False: Bias can have serious consequences.

MULTIPLE CHOICE

Choose the correct answer:

- A. True
- B. False

2. True or False: There are things we can do to help make programs more accessible for all kinds of needs.

MULTIPLE CHOICE

Choose the correct answer:

- A. True
- B. False

3. True or False: Bias is always intentional.

MULTIPLE CHOICE

Choose the correct answer:

- A. True
- B. False

4. Which of the following are populations of people we should consider when thinking about accessibility? (Select all that apply)

SELECT MULTIPLE

Select all that apply:

- A. People who see differently.
- B. People who hear differently.
- C. People who move differently.
- D. People who learn differently.
- E. People who speak differently.

5. True or False: To overcome our own natural bias, we need to consciously work to see things from other viewpoints.

MULTIPLE CHOICE

Choose the correct answer:

- A. True
- B. False

6. Why is it especially important to make sure software is accessible?

MULTIPLE CHOICE

Choose the correct answer:

- A. Software can easily reach a wide variety of people.
- B. Only kids use software.
- C. Software is more complicated than hardware.
- D. Software is harder to make accessible.

7. What are some examples of someone who speaks differently? (Select all that apply)

SELECT MULTIPLE

Select all that apply:

- A. People who speak different languages.
- B. People with voice assistive devices.
- C. People who are learning English.
- D. People who have a missing leg.

8. What are some examples of someone who moves differently?

SELECT MULTIPLE

Select all that apply:

- A. People with missing limbs or different limb shapes.
- B. People who use wheelchairs or other assistive devices.
- C. People who need assistance to use a keyboard or computer.
- D. People who are dyslexic or read differently.

9. How can bias affect the accessibility of computer programs?

MULTIPLE CHOICE

Choose the correct answer:

- A. It can make programs load slowly.
- B. It can create barriers for different groups of people.
- C. It can increase the cost of development.
- D. It can lead to excessive advertising.

10. What is the purpose of using alternate text for images and graphics in an app?

MULTIPLE CHOICE

Choose the correct answer:

- A. To make the app more visually appealing.
- B. To improve the loading speed of the app.
- C. To provide descriptions for screen readers.
- D. To translate the content into different languages.

Answer Keys & Solutions

Questions

1. True or False: Bias can have serious consequences.

MULTIPLE CHOICE

Correct Answer:

A. True

✓ Correct

B. False

✗ Incorrect

Explanation:

Sometimes important programs can leave out essential features that someone would need to access it.

2. True or False: There are things we can do to help make programs more accessible for all kinds of needs.

MULTIPLE CHOICE

Correct Answer:

A. True

✓ Correct

B. False

✗ Incorrect

Explanation:

No matter what the need is, there is often something we can do to help.

3. True or False: Bias is always intentional.

MULTIPLE CHOICE

Correct Answer:

A. True

✗ Incorrect

B. False

✓ Correct

Explanation:

Sometimes bias can happen on accident.

4. Which of the following are populations of people we should consider when thinking about accessibility? (Select all that apply)

SELECT MULTIPLE

Correct Answers:

- A. People who see differently. ✓ Correct
- B. People who hear differently. ✓ Correct
- C. People who move differently. ✓ Correct
- D. People who learn differently. ✓ Correct
- E. People who speak differently. ✓ Correct

Explanation:

All kinds of people should be able to participate

5. True or False: To overcome our own natural bias, we need to consciously work to see things from other viewpoints.

MULTIPLE CHOICE

Correct Answer:

- A. True ✓ Correct
- B. False ✗ Incorrect

Explanation:

Seeing from a different perspective requires effort.

6. Why is it especially important to make sure software is accessible?

MULTIPLE CHOICE

Correct Answer:

- A. Software can easily reach a wide variety of people. ✓ Correct

B. Only kids use software.

✗ Incorrect

C. Software is more complicated than hardware.

✗ Incorrect

D. Software is harder to make accessible.

✗ Incorrect

Explanation:

Since software can easily spread to many users, all different kinds of users should be able to use it.

7. What are some examples of someone who speaks differently? (Select all that apply)

SELECT MULTIPLE

Correct Answers:

A. People who speak different languages.

✓ Correct

B. People with voice assistive devices.

✓ Correct

C. People who are learning English.

✓ Correct

D. People who have a missing leg.

✗ Incorrect

Explanation:

People with a missing leg don't necessarily have speaking difficulty.

8. What are some examples of someone who moves differently?

SELECT MULTIPLE

Correct Answers:

A. People with missing limbs or different limb shapes.

✓ Correct

B. People who use wheelchairs or other assistive devices.

✓ Correct

C. People who need assistance to use a keyboard or computer.

✓ Correct

D. People who are dyslexic or read differently.

✗ Incorrect

Explanation:

People who read differently don't necessarily have a physical difference.

9. How can bias affect the accessibility of computer programs?

MULTIPLE CHOICE

Correct Answer:

- A. It can make programs load slowly. ✗ Incorrect
- B. It can create barriers for different groups of people. ✓ Correct
- C. It can increase the cost of development. ✗ Incorrect
- D. It can lead to excessive advertising. ✗ Incorrect

Explanation:

Bias could create accessibility challenges

10. What is the purpose of using alternate text for images and graphics in an app?

MULTIPLE CHOICE

Correct Answer:

- A. To make the app more visually appealing. ✗ Incorrect
- B. To improve the loading speed of the app. ✗ Incorrect
- C. To provide descriptions for screen readers. ✓ Correct
- D. To translate the content into different languages. ✗ Incorrect

Explanation:

Alt text describes what the image shows