

# Human-Computer Interaction Overview

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## Answers

**1. Which cognitive psychology concept directly underpins the usability principle of "recognition rather than recall" in interface design?**

- ☐ A. Short-term (working) memory limitations
- ☐ B. Long-term memory, particularly its retrieval efficiency
- ☐ C. Information processing model, focusing on motor output
- ☐ D. Sensory memory, related to initial data storage

**Answer:** Short-term (working) memory limitations (A)

*The principle of "recognition rather than recall" aims to reduce the burden on a user's short-term or working memory by making actions and options visible, so users don't have to remember them.*

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**2. The User-Centered Design (UCD) process typically concludes after the initial design solutions are developed, moving directly to product launch.**

- ☐ A. True
- ☐ B. False

**Answer:** False (B)

*The UCD process is iterative, meaning design solutions are continuously refined based on evaluation feedback, and the cycle repeats until usability goals are met, not just after initial solutions.*

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**3. Briefly explain the primary goal of Human-Computer Interaction (HCI).**

**Answer:** The primary goal of HCI is to improve the interaction between users and computers by making computers more usable and receptive to users' needs.

*HCI aims to create systems that are efficient, enjoyable, and safe for users by focusing on the interplay between humans and technology.*

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**4. In Nielsen's Usability Heuristics, the principle of "User control and freedom" emphasizes the need for a clearly marked "emergency ..... " to allow users to leave unwanted states.**

**Answer:** exit

*This heuristic ensures users feel they have control over the system and can easily undo actions or back out of processes.*

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**5. Match the interaction design paradigm with its defining characteristic:**

- |                             |             |                                                                    |
|-----------------------------|-------------|--------------------------------------------------------------------|
| 1. Ubiquitous computing     | <div></div> | A. Users submitted jobs and received output later                  |
| 2. Graphical User Interface | <div></div> | B. Direct manipulation of graphical objects with a pointing device |
| 3. Augmented reality        | <div></div> | C. Overlays digital information onto the real world                |
| 4. Batch processing         | <div></div> | D. Seamlessly integrated, invisible environmental devices          |

**Answer:**

Ubiquitous computing = Seamlessly integrated, invisible environmental devices

Augmented reality = Overlays digital information onto the real world

Batch processing = Users submitted jobs and received output later

Graphical User Interface = Direct manipulation of graphical objects with a pointing device

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**6. Which of the following is an example of a user-based evaluation method?**

- ☐ A. Usability Testing
- ☐ B. Heuristic Evaluation
- ☐ C. Cognitive Walkthrough
- ☐ D. GOMS analysis

**Answer:** Usability Testing (A)

*Usability Testing directly involves real users interacting with the system, making it a user-based or empirical evaluation method.*

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**7. Aesthetic and minimalist design in a user interface suggests including all possible information to prevent users from needing to search for it.**

- ☐ A. True
- ☐ B. False

**Answer:** False (B)

*Aesthetic and minimalist design argues against including irrelevant or rarely needed information, as excessive information can diminish the visibility of relevant details.*

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**8. What is the primary difference between formative and summative evaluation methods in HCI?**

**Answer:** Formative evaluation is conducted during the design process to improve design decisions, while summative evaluation is conducted at the end to assess overall quality and effectiveness.

*Both types of evaluation are crucial, but they serve different purposes at different stages of the design lifecycle.*

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**9. Cognitive psychology helps designers reduce the cognitive ..... on users, leading to more intuitive and understandable interfaces.**

**Answer:** load

*Reducing cognitive load means making it easier for users to process information and perform tasks without unnecessary mental effort.*

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**10. Match the Nielsen's Usability Heuristic with its corresponding description:**

1. Help

users

recognize,

diagnose,

and

recover

from

errors

A. Designing to stop problems from occurring initially

2. Error

prevention

B. Ensuring similar actions have similar meanings

3.

Consistency

and

standards

C. Providing plain language error messages with solutions

4.

Visibility

of

system

status

D. Providing appropriate feedback within reasonable time

**Answer:**

Visibility of system status = Providing appropriate feedback within reasonable time

Error prevention = Designing to stop problems from occurring initially

Consistency and standards = Ensuring similar actions have similar meanings

Help users recognize, diagnose, and recover from errors = Providing plain language error messages with solutions

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**11. Which aspect of cognitive psychology focuses on how users interpret visual, auditory, and tactile information in an interface?**

- ☐ A. Attention
- ☐ B. Problem-solving
- ☐ C. Memory
- ☐ D. Perception

**Answer:** Perception (D)

*Perception directly deals with how users perceive and interpret sensory information from the interface, impacting elements like icon design and color schemes.*

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**12. The core principle of User-Centered Design (UCD) is that aesthetic appeal should always prioritize user needs.**

- ☐ A. True
- ☐ B. False

**Answer:** False (B)

*The core principle of UCD is that user needs drive the design choices, which means functionality and usability often take precedence over purely aesthetic considerations if there is a conflict.*

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**13. Name two types of user-based evaluation methods.**

**Answer:** Two types of user-based evaluation methods are Usability Testing and Surveys/Questionnaires.

*Other valid answers include Field Studies/Ethnography and Interviews/Focus Groups.*

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**14. The concept of user ..... refers to how users form an understanding of how a system works, which designers aim to align with for intuition.**

**Answer:** mental models

*When an interface aligns with a user's mental model, the system feels more intuitive and predictable to use.*

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**15. Match the HCI field with its contribution to the discipline:**

- |                              |                      |                                                                    |
|------------------------------|----------------------|--------------------------------------------------------------------|
| 1. Human factors engineering | <input type="text"/> | A. Focuses on optimizing human well-being and system performance   |
| 2. Design                    | <input type="text"/> | B. Shapes the aesthetics and user experience of interfaces         |
| 3. Computer science          | <input type="text"/> | C. Provides the technological capabilities and system architecture |
| 4. Cognitive psychology      | <input type="text"/> | D. Offers insights into human mental processes                     |

**Answer:**

Computer science = Provides the technological capabilities and system architecture

Cognitive psychology = Offers insights into human mental processes

Human factors engineering = Focuses on optimizing human well-being and system performance

Design = Shapes the aesthetics and user experience of interfaces

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**16. What is the primary benefit of accelerators, such as keyboard shortcuts, in an interface design?**

- ☐ A. They primarily aid in error prevention for novice users.
- ☐ B. They improve consistency with real-world metaphors.
- ☐ C. They enhance flexibility and efficiency for expert users.
- ☐ D. They reduce system status visibility.

**Answer:** They enhance flexibility and efficiency for expert users. (C)

*Accelerators cater to experienced users, allowing them to perform tasks more quickly and efficiently, demonstrating the flexibility and efficiency of use heuristic.*

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**17. According to Nielsen's heuristics, matching the system to the real world means using highly technical, system-oriented terms for accuracy.**

- ☐ A. True
- ☐ B. False

**Answer:** False (B)

*The heuristic states that the system should speak the user's language, using familiar words and concepts, rather than system-oriented terms, to better match the real world.*

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**18. What is 'usability' in the context of Human-Computer Interaction?**

**Answer:** Usability refers to the ease of use and learnability of a human-made object, such as a software application or a website.

*It's a key aspect of HCI, aiming to make technology more accessible and effective for its users.*

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**19. A ..... walkthrough is an expert-based evaluation method where experts simulate a user's step-by-step interaction to assess learnability.**

**Answer:** cognitive

*A cognitive walkthrough focuses specifically on how easily new users can learn to complete tasks within the system.*

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**20. The user-centered design stage that involves understanding who the users are, their tasks, and the environment is known as which of the following?**

- ☐ A. Summative evaluation
- ☐ B. Requirement specification
- ☐ C. Design solutions
- ☐ D. Context of use analysis

**Answer:** Context of use analysis (D)

*Context of use analysis is the initial phase of UCD where ethnographic studies, interviews, and surveys are often used to gather a deep understanding of the user and their environment.*

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