

From Frustration to *Flow*

Optimizing Onboarding for Cognitive Accessibility in Gaming



VIDEO GAMES AS CULTURAL AND SOCIAL TOOLS

- Fastest growing entertainment sector, with significant cultural impact
- They serve as modern cultural touchstones, fostering connection and shared experiences.
- 61% of the US population and 40% of the global population play games regularly.



Animal Crossing: New Horizons (Nintendo Switch, 2020)

Sources: (Salen & Zimmerman, 2004),
(Entertainment Software Association, 2024),
(Exploding Topics, 2024)

THERAPEUTIC AND EDUCATIONAL BENEFITS OF GAMES

- **Games as tools for cognitive and emotional support:**
 - Research shows benefits for mental health and well-being (e.g., stress relief, resilience).



Dall-E generated image of Hollow Knight on the beach

(Boldi & Rapp, 2021)

THERAPEUTIC AND EDUCATIONAL BENEFITS OF GAMES

- **Cognitive and Literacy Improvements:**
 - Action games can enhance visual acuity and perceptual skills.
 - Studies have found that games improve reading and learning outcomes for dyslexic children.



Alakazam (Pokemon), showing what he's learned.

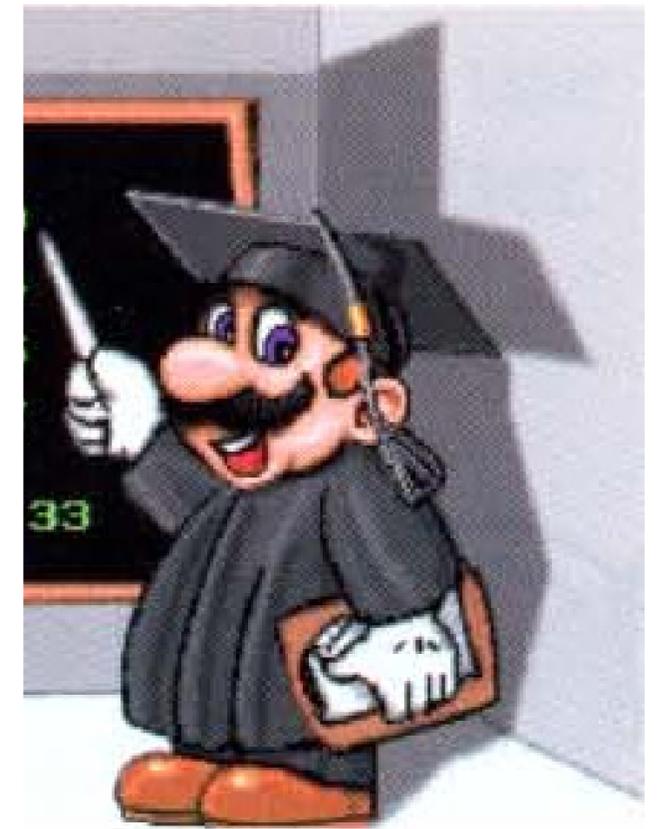
(Franceschini et al., 2013).

THERAPEUTIC AND EDUCATIONAL BENEFITS OF GAMES

- **Treatment Applications:**
 - Games are used in therapeutic settings, like PTSD treatment, offering interactive therapy options.
 - Potential applications in learning tools and developmental support for diverse needs.



Dr. Mario (Nintendo)



Mario Teaches Typing (Nintendo)

(McGonigal et al., 2020)

IMPORTANCE OF ACCESSIBILITY IN GAMING

- **Accessibility barriers prevent many from fully participating in gaming's cultural space.**
 - 66% of gamers with impairments report facing challenges with current game designs.
- **Exclusion Implications:**
 - Limits access to social interactions, learning opportunities, and emotional benefits.
 - Reinforces a lack of representation and engagement for those with disabilities.



The Legend of Zelda: Ocarina of Time (Nintendo 64, 1998)

(Scope, 2022)

FOCUS ON *COGNITIVE DIFFERENCES*

- **“Cognitive Differences”:**
 - Supports users with diverse cognitive abilities, aiding in tasks like planning, remembering, interpreting, and problem-solving.
- **The Role of Neurodiversity:**
 - Cognitive differences acknowledges neurodiversity (e.g., ADHD, autism, dyslexia).
- Encompasses a range of circumstances that require varied design approaches.



(Sousa et al., 2023)

MEDICAL MODEL

VS.
(OF DISABILITY)

SOCIAL MODEL

- Views disability as a deviation from a perceived "normal" (Adams et al., 2015).
- Emphasizes "curing" or managing disabilities through medical intervention (Adams et al., 2015).
- Design solutions focus on addressing individual impairments within a medical framework (Adams et al., 2015).

- Defines disability as resulting from barriers within environments and societal structures (Adams et al., 2015).
- Emphasizes removing physical, social, and technological barriers that restrict access (Foley & Ferri, 2012).
- Shifts focus from individual limitations to creating inclusive spaces that support a range of abilities (Holmes, 2018).

INCLUSIVE DESIGN PRINCIPLES

- Seeks to accommodate diverse cognitive characteristics and needs (Palmquist et al., 2024).
- Aims to create experiences that support autonomy and meaningful participation (Holmes, 2018).
- Recognizes that diverse player abilities enhance the richness and inclusivity of gaming communities (Foley & Ferri, 2012).



From *Mismatch: How Inclusion Shapes Design*, by Kat Holmes

USER EXPERIENCE VS. PLAYER EXPERIENCE

Table 1.2 Differences between UX and PX

User experience (UX)	Player experience (PX)
Scope: UX encompasses all user interactions with a product or service. Typically includes websites, apps, software, and, to some extent, physical products	Scope: PX is a subset of UX specific to video games and interactive entertainment. While UX can be applied to any product or service, PX is exclusively concerned with the experience of playing a game
Goal: The primary aim of UX is to ensure that users can achieve their objectives as efficiently, effectively, and enjoyably as possible. Entangles create intuitive, accessible, and user-friendly interfaces	Goal: While UX aims for efficiency and effectiveness, PX often seeks to evoke specific emotions, immerse the player, and ensure they are entertained and engaged. Enjoyment, challenge, frustration (within reason), and immersion can all be intentional parts of the PX
Components: UX involves multiple components, including usability, accessibility, information architecture, visual design, content strategy, and more	Components: PX involves game mechanics, narrative design, audio design, game aesthetics, player agency, and more, in addition to traditional UX components
Feedback and Metrics: In UX, success is often measured by metrics like task completion rate, time on task, user satisfaction surveys, net promoter score, etc	Feedback & Metrics: PX might be measured by player retention, time played, in-game achievements, and player satisfaction, among other metrics

Palmquist et al., pg. 29 (2024)

KEY PRINCIPLES FOR COGNITIVE ACCESSIBILITY IN GAME DESIGN:

Feedback Clarity

**Game/Level Design
Simplification**



**Streamlined User
Interface**



**Simplified Visual
Information**



(Sousa et al., 2023)

Onboarding Design

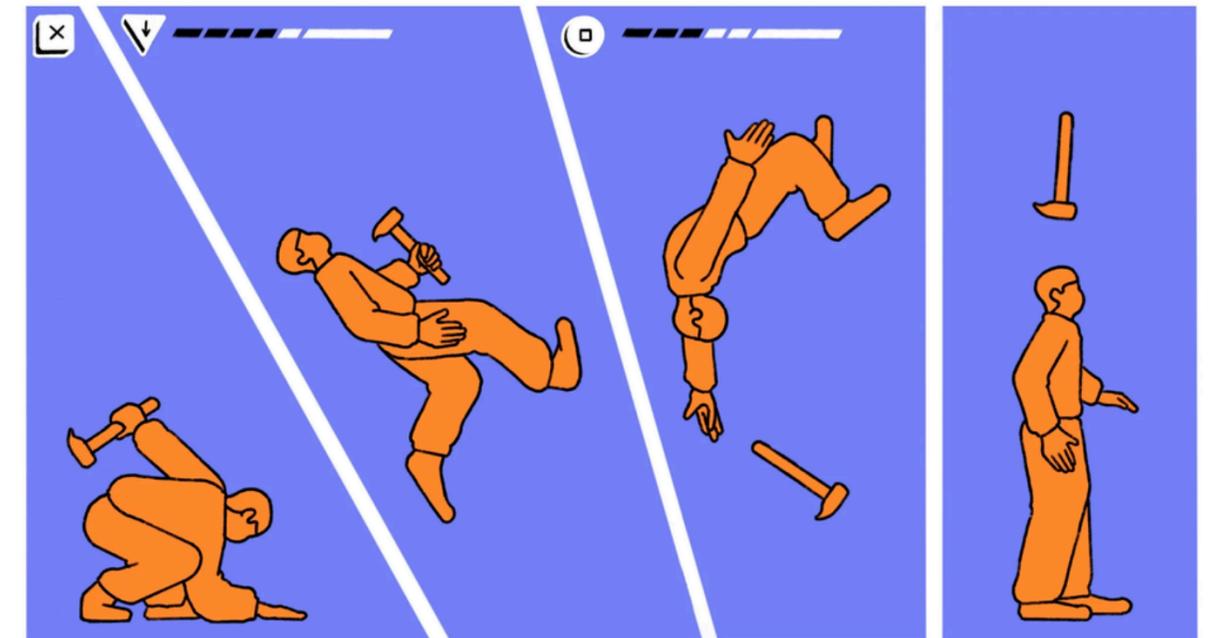


(Sousa et al., 2023)



Hands-On Learning

- Design tutorials that require players to actively engage with game mechanics
- Provide safe, low-stakes environments where players can practice skills without penalty
- Active engagement enhances learning retention and supports player immersion



Courtesy Wired.com

(Sousa et al., 2023)



Gradual Introduction of Mechanics

- Introduce new mechanics step-by-step to avoid overwhelming players
- Use “distributed learning,” spreading information across gameplay rather than frontloading it
- Gradual pacing allows players to internalize controls and features, building familiarity as they progress



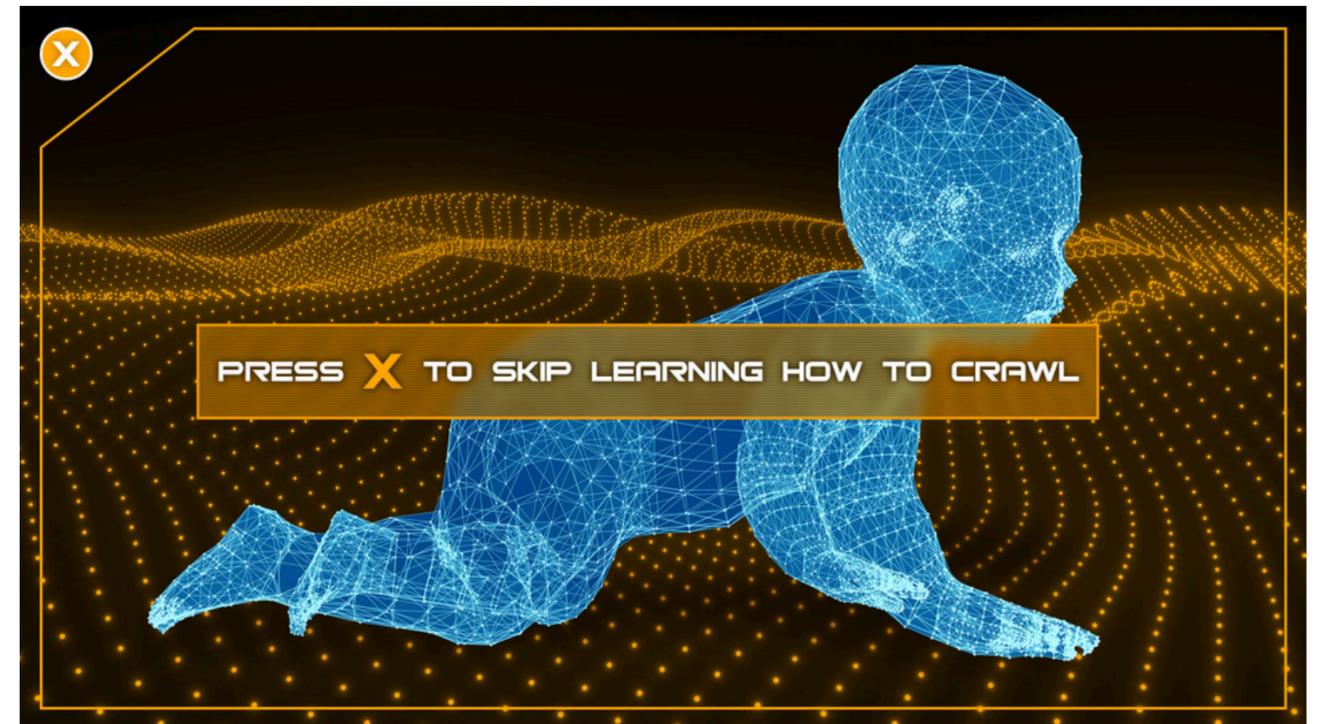
Super Metroid, 1994

(Sousa et al., 2023)



Optional and Skippable Segments

- Include options to skip (and revisit!) tutorial elements, accommodating different player experience levels
- Allow players to control the onboarding process, creating a sense of autonomy and reducing frustration
- Skippable segments support flow, letting experienced players advance quickly while still guiding newcomers



Courtesy Ars Technica

(Sousa et al., 2023)



Reducing tutorial length and text

- Focus on short, action-oriented tutorial sequences that minimize text
- Reduce reliance on lengthy text instructions, favoring direct, hands-on cues
- Interactive guidance helps players understand mechanics intuitively, lowering cognitive load and fostering immersion



The verbose Owl from The Legend of Zelda: Ocarina of Time

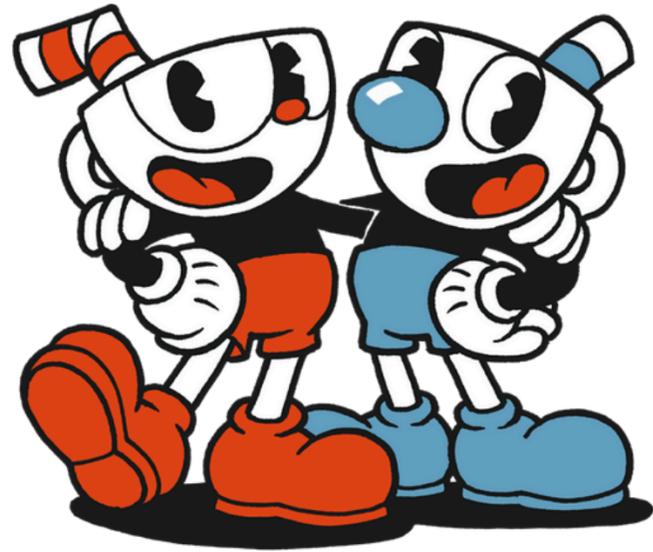
(Sousa et al., 2023)

Balancing Challenge and Inclusion





Challenging Gameplay as a Core Appeal



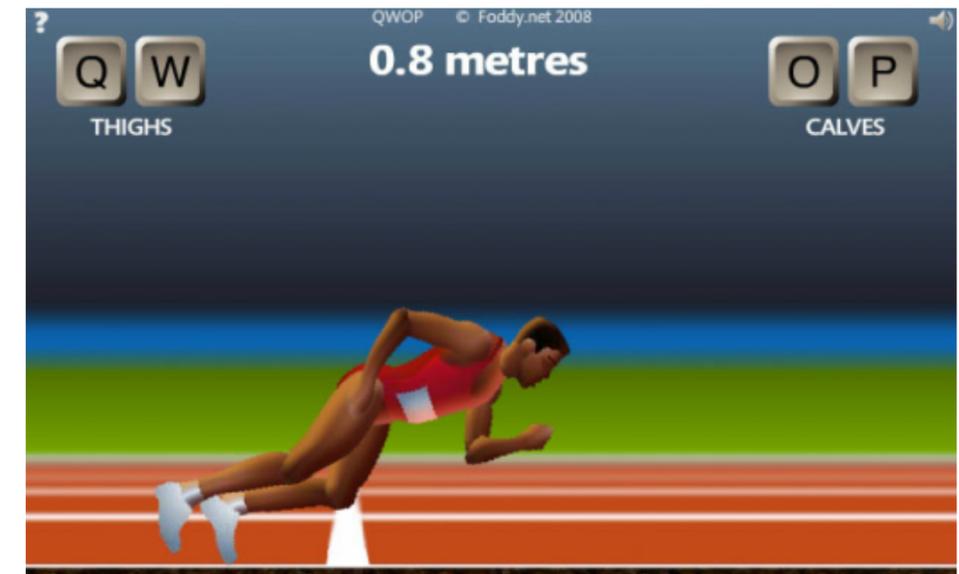
Cuphead



Ikaruga



Souls Franchise



QWOP



Challenge can enhance enjoyment, but it **may alienate players without adequate support**



The Legend of Zelda: The Wind Waker (2003)



Importance of **scaffolding**:

- Scaffolding provides tailored support that helps players gradually develop skills.
- Offers a structured way for players to progress, without removing the game's intended difficulty.



Literal Scaffolding in Half-Life 2 (2004)



Inclusive Design *Enables Flow for All Players*

- Accessible features allow a wider range of players to reach a state of flow—total immersion and enjoyment in gameplay.
- Scaffolding and optional difficulty adjustments give players control over their experience, balancing autonomy with support.
- Inclusive design makes games accessible without diluting the sense of achievement that comes from overcoming challenges.



Flower (2009)



Expanding Inclusion *Without Compromising Flow*

- Adaptive systems, like customizable difficulty settings, allow diverse players to enjoy challenging games at their own pace.
- A well-designed game can be difficult yet inclusive.
- By incorporating principles of inclusive design games can provide satisfying experiences for both novice and expert players alike.



A Short Hike (2019)

(Hodent, 2018)

(Palmquist et al., 2024)

(Sousa et al., 2023)

