# The Gamer's Brain: part 2

## UX of Onboarding and Player Engagement


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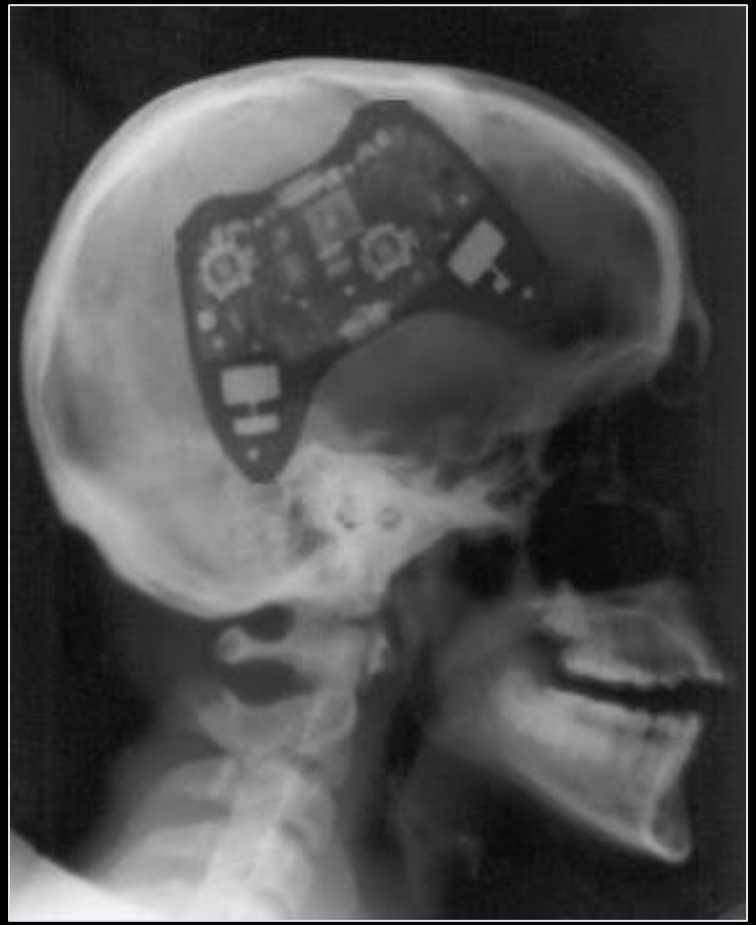
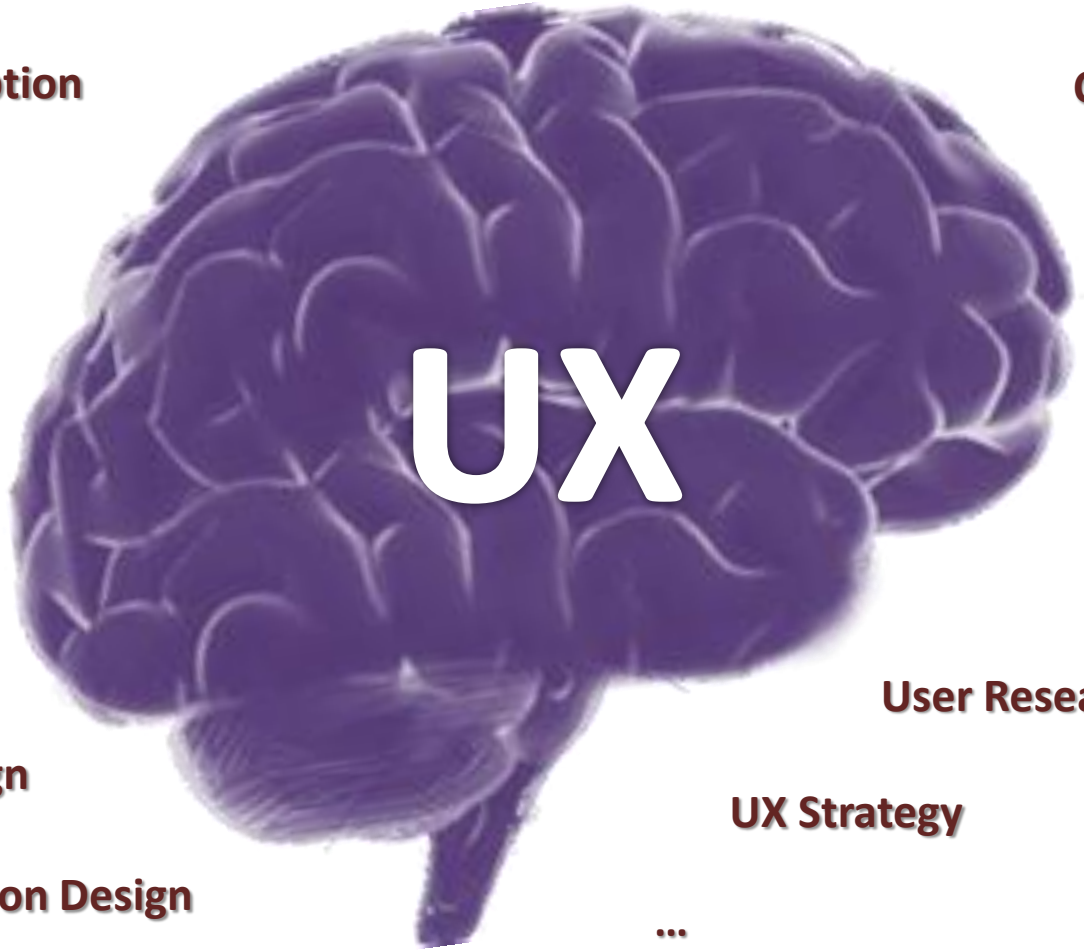
UBM



# Introduction:

## Reminders




Perception

Interaction

Satisfaction

Emotions

Cognitive Science

Human Factors

HCI

User Research

UX Strategy

...

UX Design

Interaction Design

# REMINDER: How the brain learns

**PERCEPTION**
(input)


**INFLUENCING FACTORS**

**INFO PROCESSING**

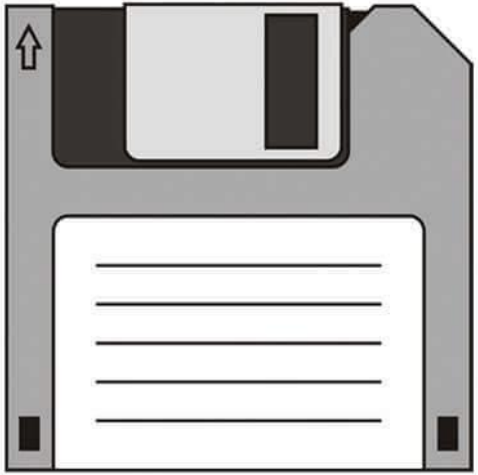
**MEMORY**
(synaptic modification)

# Perception: How it works

**Perception is a construct of the mind. It is subjective.**

# Perception: It's subjective

Floppy disks are like Jesus



They died to become
the icon of saving

# Memory: How it works

## SENSORY MEMORY

Part of perception
Importance of attention


ENCODING

## WORKING MEMORY

Short-term – Easily disturbed
Requires heavy attentional resources

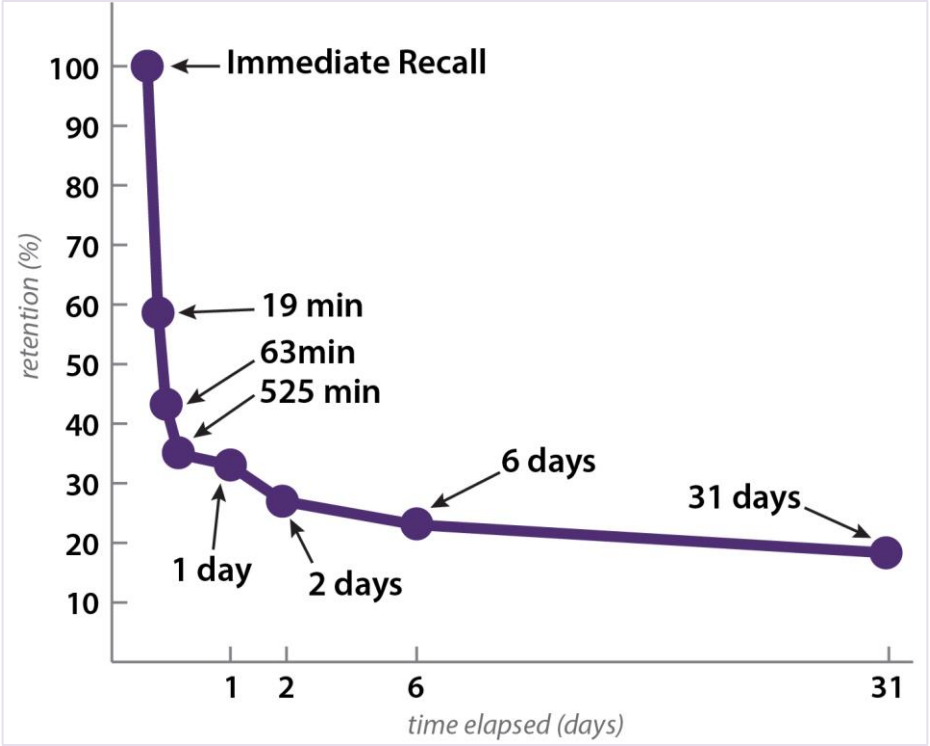
STORAGE

## LONG-TERM MEMORY

No known limits
in time and space

# Memory: It's fragile

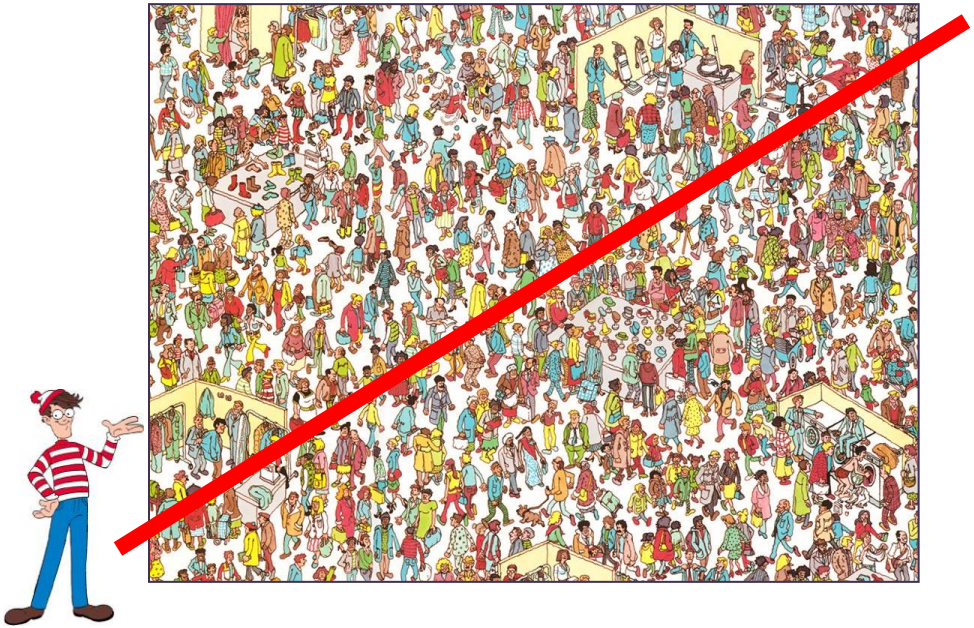
## Forgetting curve:




(Ebbinghaus, 1885)

# Attention: How it works

**We are not carefully scanning all of our environment …**



**Rather, attention works like a spotlight.**

# Attention: It's VERY limited



**Inattentional blindness (or why we suck at multitasking …)**

# User eXperience

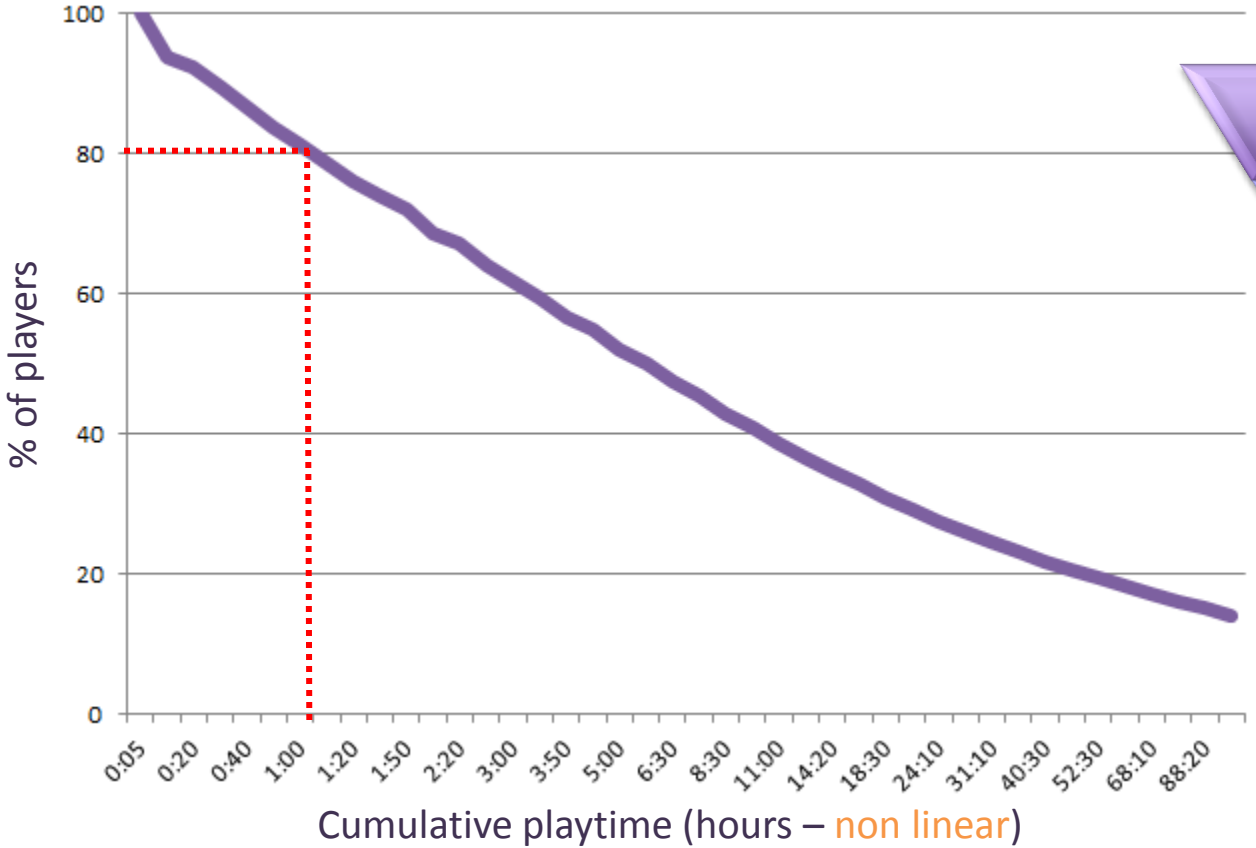
## Usability

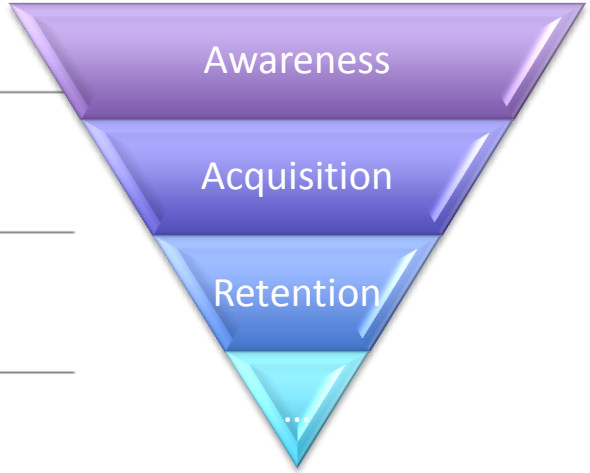
- ❑ Signs & Feedback
- ❑ Clarity
- ❑ Form Follows Function
- ❑ Consistency
- ❑ Minimum Workload
- ❑ Error Prevention / Recovery
- ❑ Flexibility

## GameFlow

- ❑ Perceived Pacing
(challenge, learning curve, surprises, …)
- ❑ Motivation
(competence, autonomy, relatedness)
- ❑ Emotion
(game feel, implicit motivation, …)

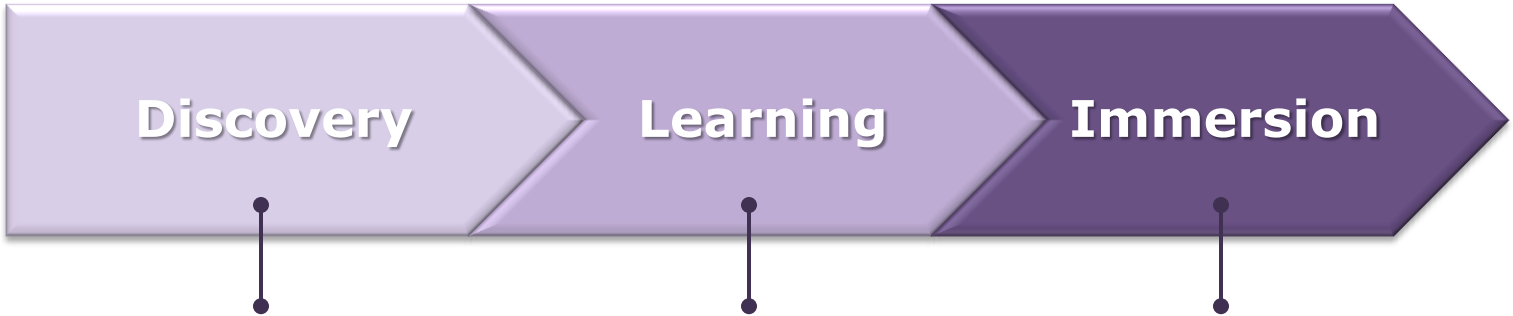
# Why does onboarding matter?




*Source: Steam Spy (Warframe)*

# Onboarding: Elements to consider

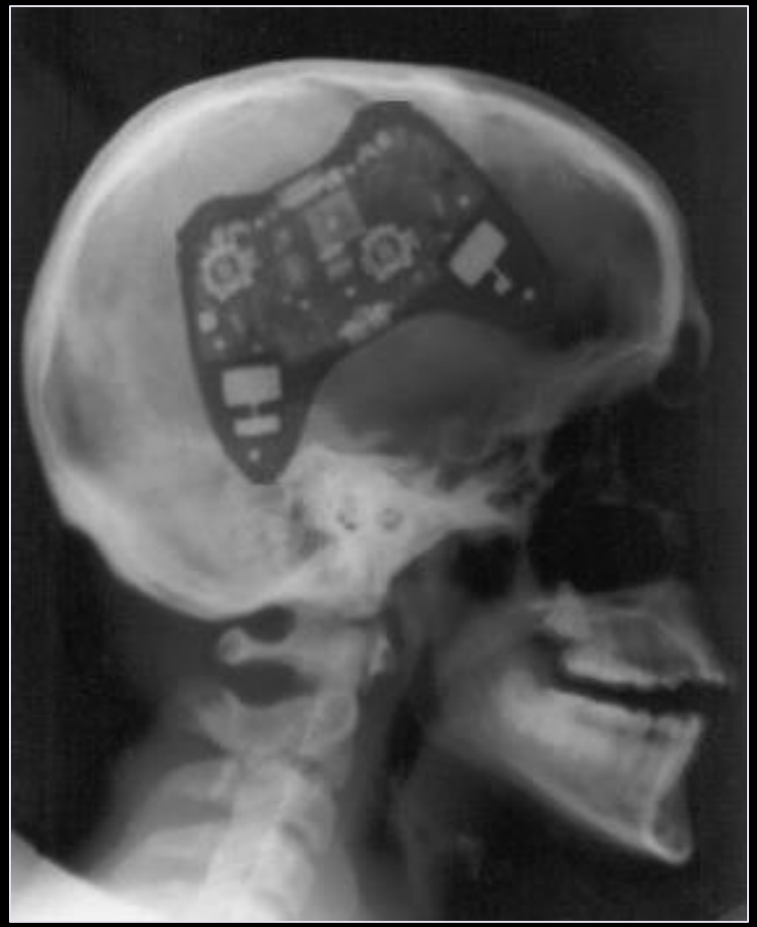


# Learning Principles


- **Behavioral** Psychology Principles

- **Cognitive** Psychology Principles

- **Constructivist** Psychology Principles



Discovery | Learning | Immersion

# Discovery:

## Remove barriers

# Working Memory: Limitations

**WM is composed of 2 "slave systems" that maintain and process information:**

**VISUAL-SPATIAL TASKS**
**MOTOR TASKS**

**PHONOLOGICAL TASKS**
**(LANGUAGE IN ALL FORMATS)**

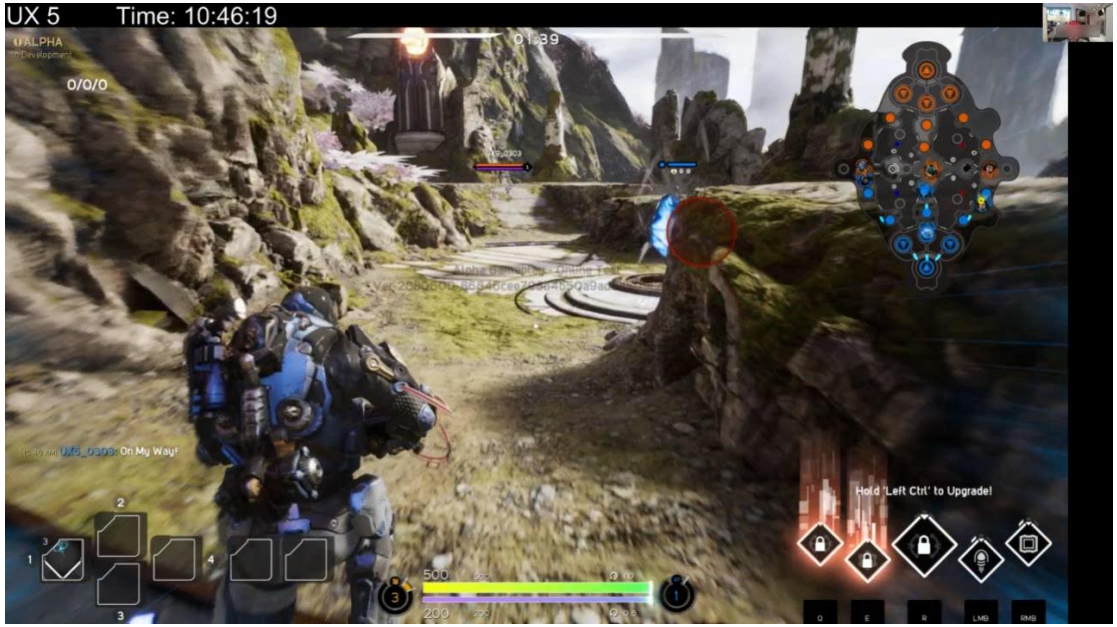

→ It's nearly impossible to do 2 complex tasks of the same type.
→ It can be trained (but only to a certain extent).

# Divided Attention


*Fortnite: fort behind is being attacked but the Constructor player does not even look at the pop up info (red circle is eyetracking)*

# Cognitive Load Theory

## **Working memory span** = 3 “items” on average




*Paragon alpha: first minutes of play*

# Limit cognitive load: Affordances

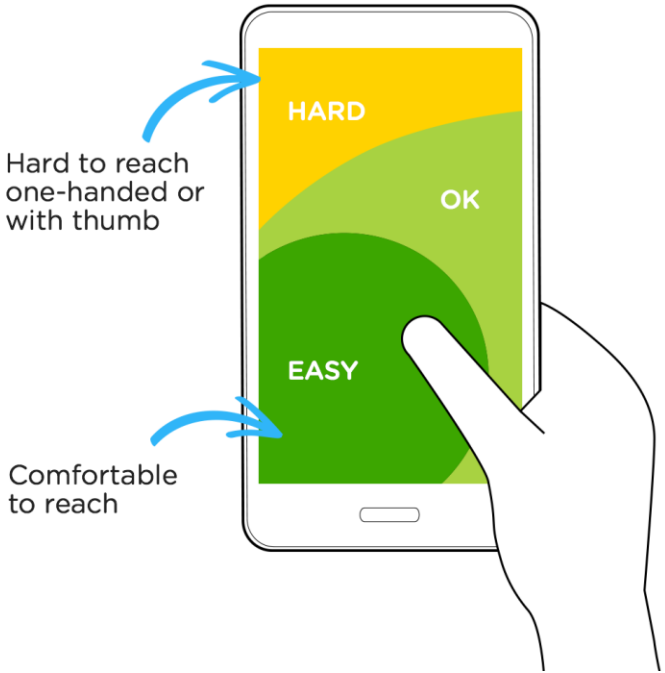
**4 kinds of affordances in UX design:**

- Physical affordance
- Cognitive affordance
- Sensory affordance
- Functional affordance


**The perceivable part of an affordance is a signifier** (cf. Don Norman's work)

# Affordances

## Physical affordance (or “real” affordance)

# Affordances

## Cognitive affordance (or “perceived” affordance)


*Fortnite: 3 different symbols help understand there are 3 types of materials and how many of each the player has.*

# Affordances

## Cognitive affordance going wrong: false affordance


*Fortnite: only the pickaxe is the right tool to harvest in Fortnite (functionality) but players believe axes can efficiently harvest wood.*

# Affordances

## Sensory affordance


*Fortnite: Sensory affordance*
*« Click to respawn » violated*


*Player doesn't realize that he's slotting the same worker (red corner signifier not working)*

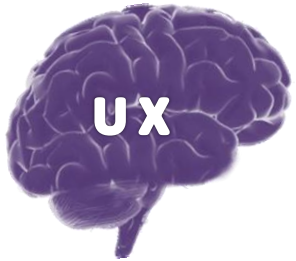
# Affordances

## Functional affordance

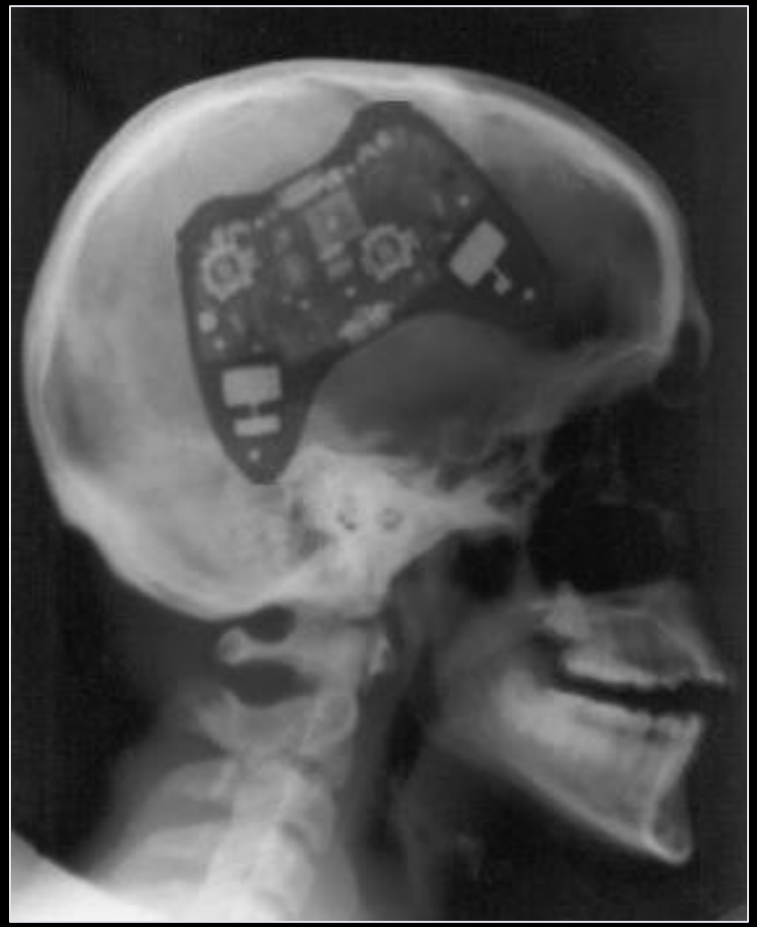

*Fortnite: inventory categories and pinning are functional affordances*

# Affordances

# Discovery: Key takeaway




| | Discovery | Learning | Immersion |
|---|---|---|---|
| **Mind the…** | Attention limitations<br>Cognitive load | | |
| Main Objective: | Easy to make sense of<br>Remove barriers | | |
| **Use (i.e.)…** | Usability principles | | |



Discovery | Learning | Immersion

# Learning:
## Active Tutorials

# Application: Context and Meaning

The deeper you process information (= focus your attention)
the better you learn/retain …

Context = learning by doing
Meaning = worthwhile now (for player's life/mission/goal)

**DON'T PUNISH *WHILE* TEACHING!!**

***Paragon alpha (loading screen)***
No context, no meaning

***Fortnite alpha (door tutorial)***
Context, no meaning

***Fortnite alpha (door tutorial iteration)***
Context and meaning

**LEARN THEN DO**
(shallow process, weak motivation)

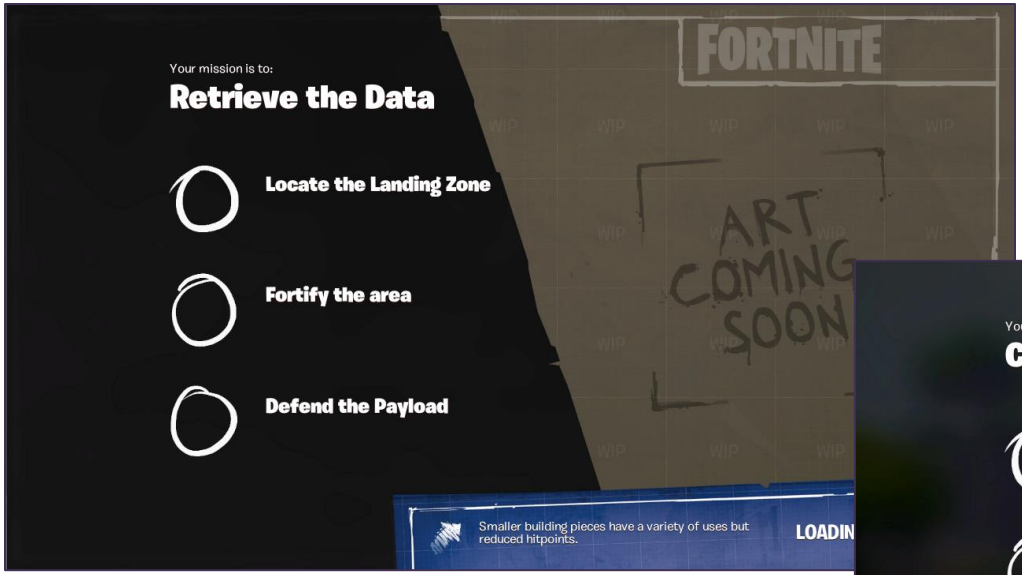
**LEARNING BY DOING**
(deeper process when in context, greater motivation with meaning)

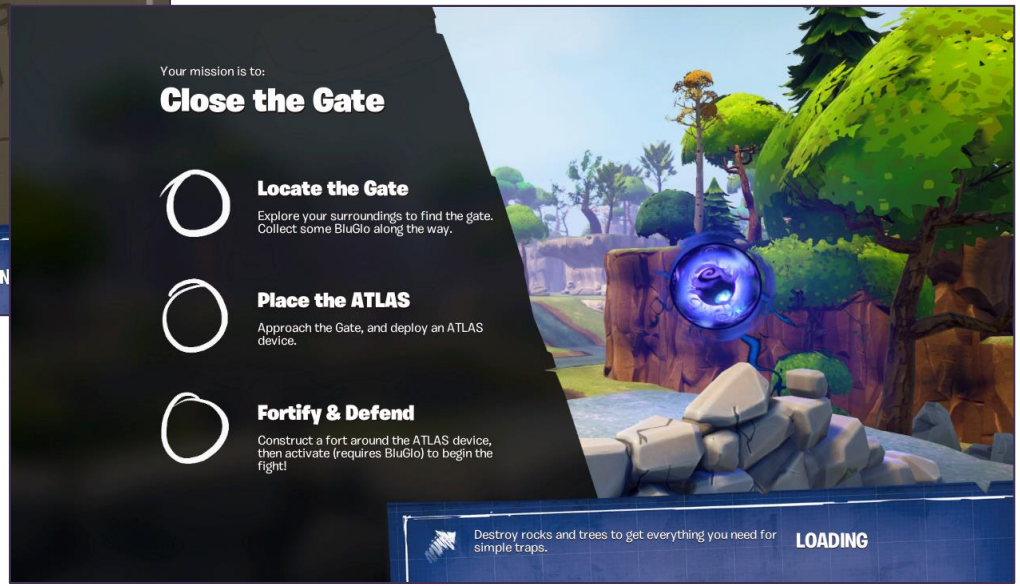
# Cognitive Load Theory



*Fortnite: PvP prototype for ux testing*

# The Case of Loading Screens: Psychology of Waiting



# Engaging Tutorials: Teach the *why*

**WHY?**

→ Motivate players

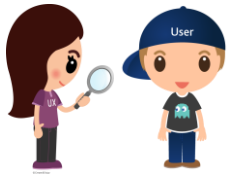
**HOW?**

→ 3 main points

**WHAT?**

→ Interactive elements

**UX Testing**




*Cf. Simon Sinek*

# The deeper the process the better the retention


*The learning pyramid*

# Memory lapse

## Encoding Deficit

Information was superficially encoded because of a lack of attention, or because of a failed elaboration process.

→ **Draw attention**

## Storage Deficit

Information was correctly encoded, but weakens with time.

→ **Repetition** (in different contexts)

## Recall Deficit

Information is available in memory but is momentarily inaccessible

→ **Reminders**

# Memory lapse: ENCODING deficit


I am a little bit confused on the process of building and repairing objects. I feel a run down on a lot of the essential item properties would be helpful.

11/23/2015 11:52 AM View respondent's answers Categorize as... ▾

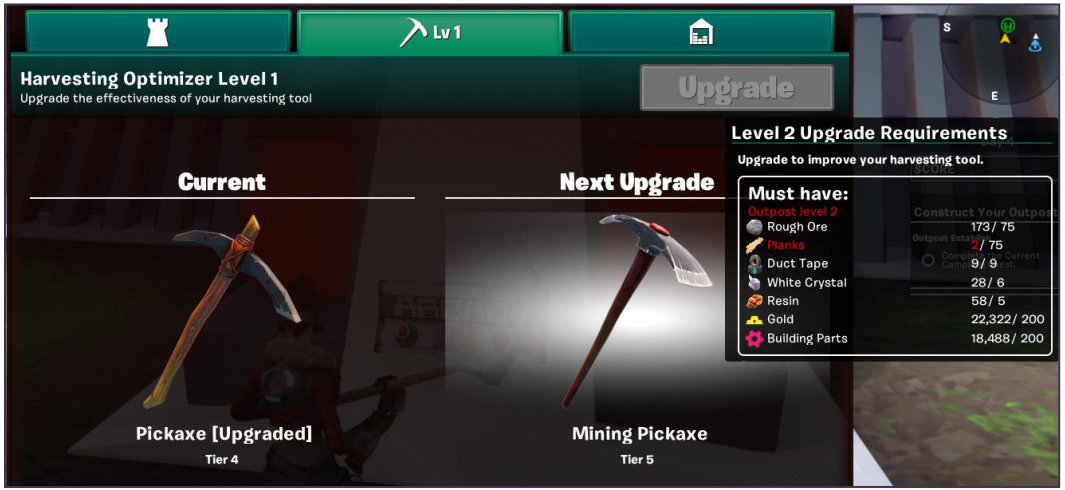
there was no easily found way to repair weapons that were damaged

11/23/2015 11:18 AM View respondent's answers Categorize as... ▾

# Memory lapse: STORAGE deficit

**Pinning** = no info storage needed


**No Pinning** = info storage needed



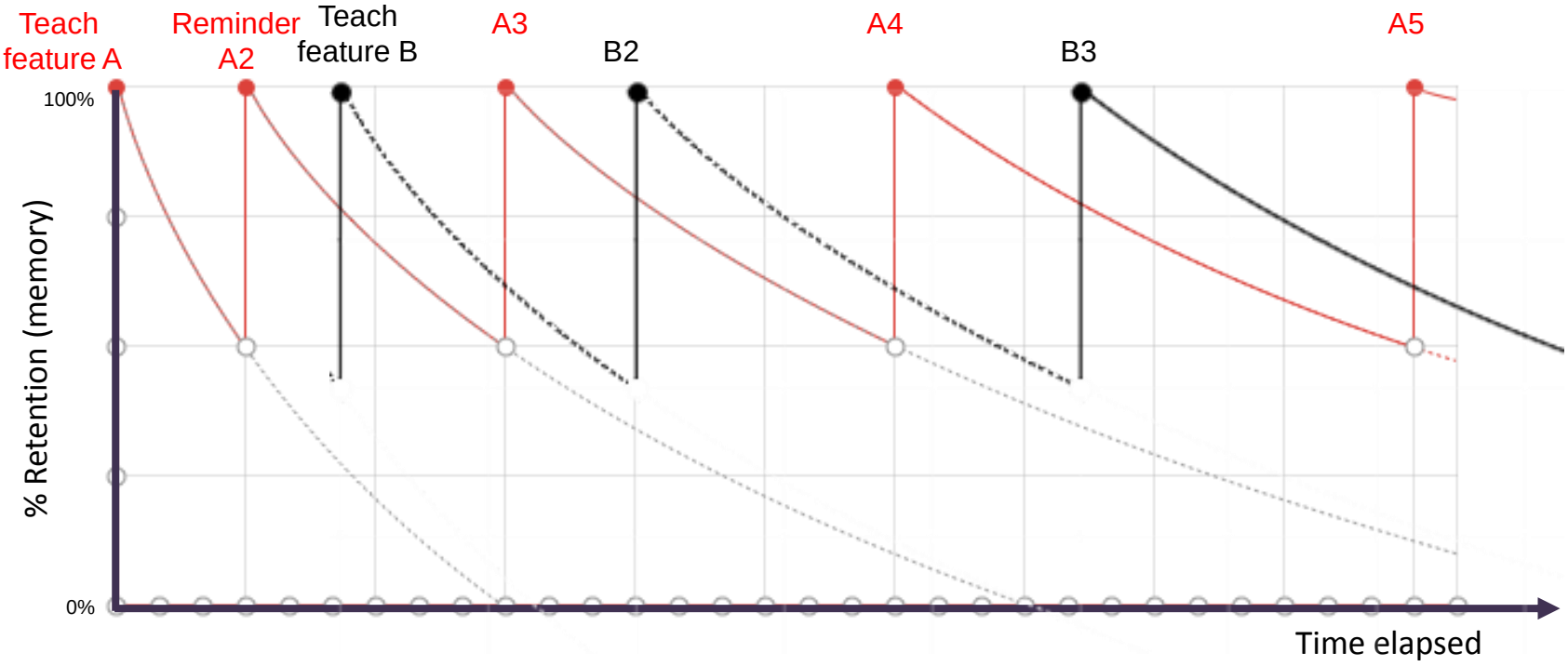

# Memory lapse: RECALL deficit



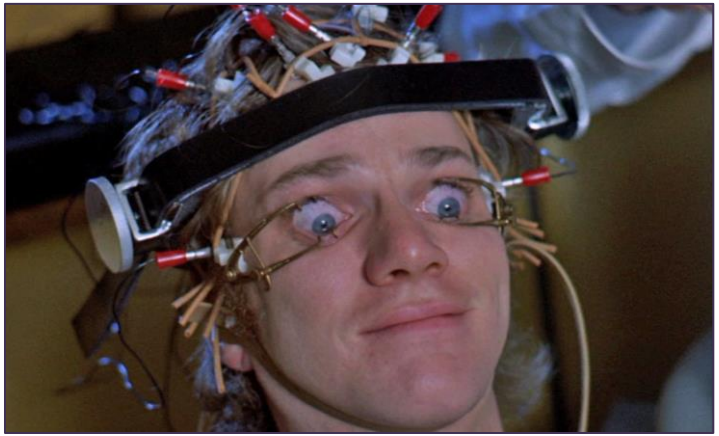
I couldn't remember how to get to the craft screen
11/23/2015 12:06 PM View respondent's answers Categorize as...

# Tutorials: repetition

The **spacing effect** of reminders:



# Implicit Learning: Behavioral Psychology



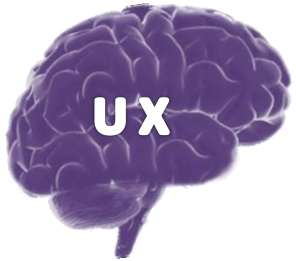
## Classical Conditioning (Pavlov)

When 2 events happen close to each other repeatedly, you ***implicitly*** learn to link them (associative learning).

## How about this stimulus?*

**Courtesy of MGS's Players Conditioning Program*

# Learning: Key takeaway

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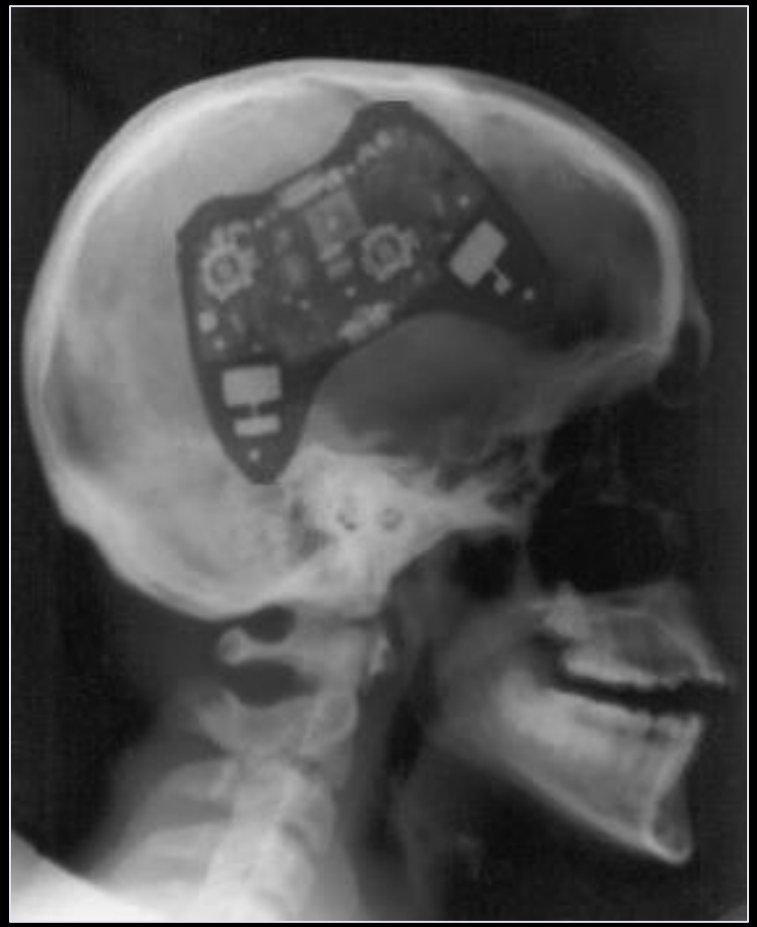


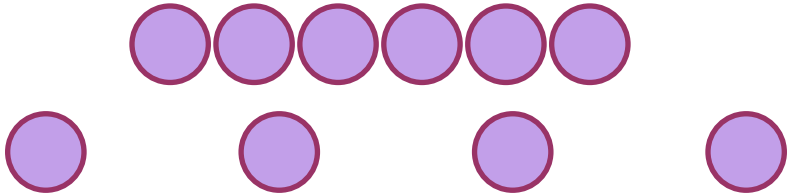
Discovery | Learning | Immersion

# Immersion:
## About Motivation

# Motivation

## Motivation helps attention

Concept of number in Piaget's task (using tokens)



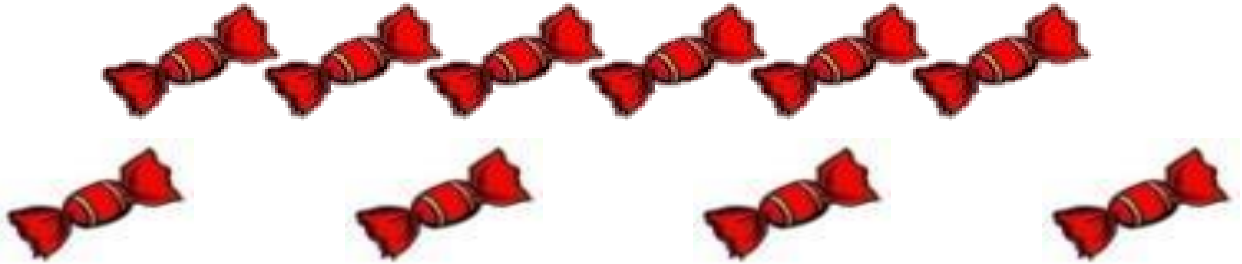
Succeeded at 6-7 yo

# Motivation

## Motivation helps attention

Concept of number in Piaget's task (using tokens)

vs. in Mehler's task (using candies)



Succeeded at **2 yo**!

# Motivation

## EXPLICIT MOTIVATION

**Extrinsic motivation**
(rewards)

**Intrinsic motivation**
(Self-Determination Theory:
competence, autonomy, relatedness)

## IMPLICIT MOTIVATION

Life and death **drives**
Power seeking

**Brain pleasure center**
(learning, novelty)
**Brain reward circuitry**

# Motivation: Teasing

*Zelda – Phantom Hourglass (DS)*

# Motivation: Teasing

# Motivation: Teasing


*Fortnite HUD (march 2015)*


*Fortnite HUD (march 2016)*

# Motivation

## Short-term

- **Win the Match**


- **Catch more Pokémon**

*Pokémon*

## Mid-term

- **Beat the next trainer**

- **Evolve your Pokémon**


## Long-term

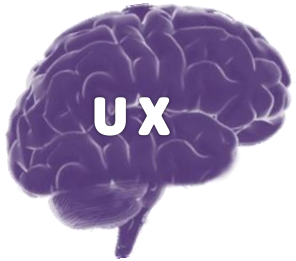
- **Beat the Elite Four**

- **Gotta catch ‘em all**

# Social Impact in Learning


*Team Fortress 2*

# Immersion: Key takeaway

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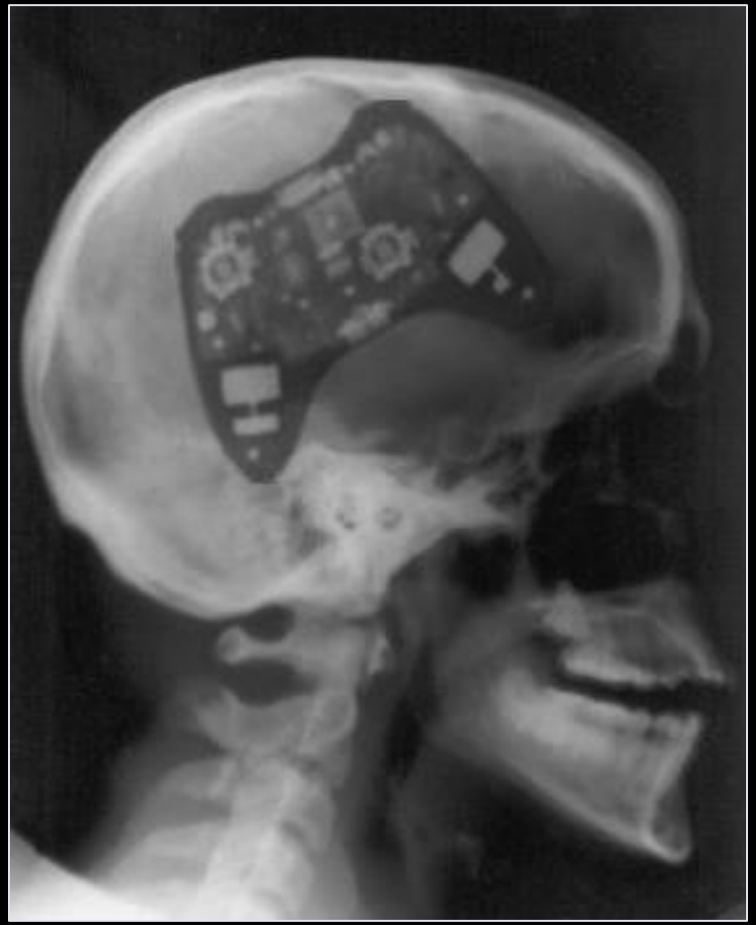
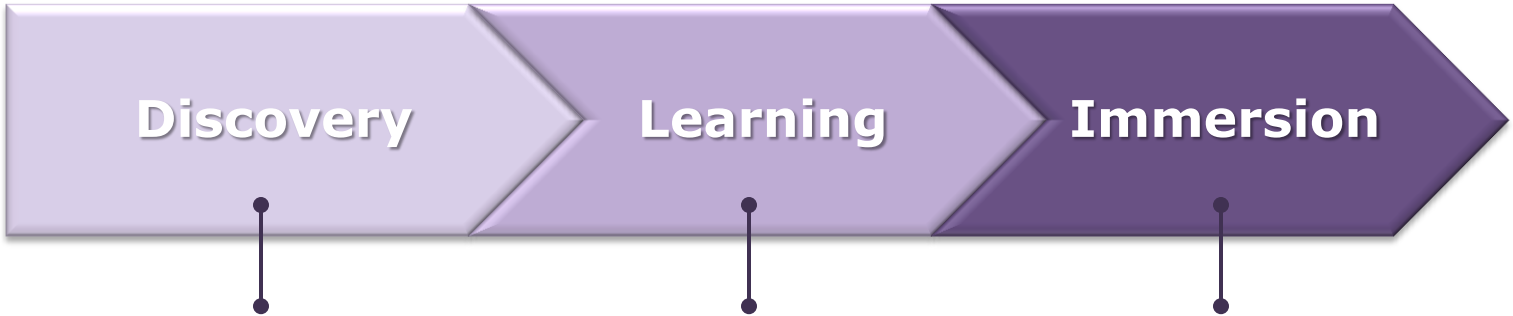
| Main Objective: | Easy to make sense of<br>Remove barriers | Easy to learn<br>Context and Meaning | Tease<br>Show progression path |
| **Use (i.e.)…** | Usability principles | Learning principles | Motivation principles |



# Conclusion

# Onboarding: Elements to consider



# A UX Framework: *ingredients*

# User eXperience

## Usability

- ❑ Signs & Feedback
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## GameFlow

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(challenge, learning curve, surprises, …)
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(competence, autonomy, relatedness)
- ❑ Emotion
(game feel, implicit motivation, …)

# Iteration

**This is not a recipe … only a few ingredients …**

**Iteration is key!**


*League of Legends - beta*

# THANKS!

**Game UX Summit (May 12th):**
epicgames.com/game-ux-summit

**Book WIP:**
The Gamer's Brain (2017, CRC Press)


@CeliaHodent

**Slides**: celiahodent.com (up soon!)