

# Gamification 209

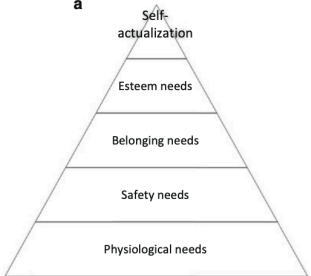
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## Today's Structure

- What is the theory?
- How does it apply to learning?
- How does it apply to gamification?


## Hierarchy of Needs

- What is it?

a


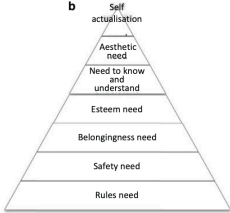
## Hierarchy of Needs

- Effects on society & learning
  - Students suffering trauma, poverty have trouble learning
  - Hunger is distracting
  - Fear is distracting
  - Pain is distracting
  - Students who don't belong
    - Stereotype threat: internal
    - Bias, discrimination: external

a


## Hierarchy of Needs

- Application to games
  - Need to understand the rules
  - Safety & information as to how to win
  - Feel comfortable and believe they can achieve goal
  - Learn strategies
  - Aesthetic properties

b


## Need Achievement Theory related to Growth Mindset

- Goals: Achieve success or avoid failure
- Achieve success: intermediate difficulty
- Avoid failure: very simple or very difficult
  - Too easy: assured success
  - Too hard: not your fault – unachievable – no one expected you to succeed
- Growth mindset vs Fixed Mindset
  - GM: Belief success is based on actions, FM: innate traits
  - Those with GM tackle harder tasks (to learn more)
  - Those with FM tackle easier tasks (to avoid failure)

## Need Achievement Theory

related to Growth Mindset

- Need achievement theory: learning
  - Intermediate difficulty are those in ZPD, leading to the most learning
  - Easy and hard lead to less learning
- Growth mindset: learning
  - Try to look smart
    - Take easier classes, tasks
  - Look for excuses for failure other than innate traits
    - Procrastinate
    - Don't ask for help

## Need Achievement Theory

- Applied to games:
  - Games can combat desires to choose really easy things because the game has levels
  - People can choose difficulty
  - Start levels very easy, get harder to feel progress
  - Provide lots of ways to succeed – intermediate rewards
  - Tutorial achievements for learning the game, style achievements to extend the game

## Goal Setting Theory

- What is it?
  - Difficult, specific, context-appropriate, immediate goals (rather than long-term goals) motivate more.
  - Goals specific & challenging, within ability level, feedback provided, rewards given, and goals accepted.

## Goal Setting Theory

- Applied to learning
  - American university education system
    - Homework, projects, exams
  - UK university education system
    - Exams
  - Middle school experiment
    - Rewards for things **actions** (attendance, turning in homework, etc.) more successful than rewards for **achievement** (grades).

## Goal Setting Theory

- Applied to games
  - Badge system for rewards
  - Gradually increasing levels – not too fast, not too slow
  - Short levels that focus on individual skills
  - LT's break down big concepts / skills into little ones for more rewards & feedback

## Self-Efficacy

- What is it?
  - Confidence in abilities for a specific activity
  - Affects choices in challenges tackled, effort expended, persistence and task performance.
  - Affects motivation
  - Affects persistence in the face of failure
    - Blame external rather than internal factors
    - Analyze what you need to do to improve
    - Less emotion involved
  - Things that affect self-efficacy
    - Performance\*\*, observations of others, verbal persuasion and social influences.

### Self-Efficacy

- Applied to learning
  - Satisfaction knowing you did your best, outcome is the reward
  - Moving forward, you can make progress
  - Someone at 100% growth mindset would have high self-efficacy, believing effort will lead to success
  - Improved sense of belonging
  - Less likely to transfer out of major in failure
  - How underrepresented groups are treated by dominant peers affects it
  - Early, small, positive experiences can build self-efficacy

### Self-Efficacy

- Applied to games
  - Small goals with immediate feedback
  - Seeing others' similar progress helps (others' superior progress doesn't)
  - Social media is important
    - Keep it kind, positive

### Personal Investment Theory (PIT)

- What is it?
  - Meaning motivates behavior – participation, expending time and effort
  - meaning: personal incentives (extrinsic & intrinsic), sense of self (ideals related to motivations), and perceived options (alternative activities)

### Personal Investment Theory (PIT)

- Applied to learning
  - Rewards: grades (extrinsic), learning (intrinsic), challenge (intrinsic)
  - Affects decisions like
    - Time spent on homework
    - Time spent studying
    - Quality of work
    - Depth of learning
  - Colorado study building sense of self resulted in higher persistence, grades

### Personal Investment Theory (PIT)

- Applied to games
  - Badges, points are rewards
  - Often tied to performance, sometimes participation (logging in)

### Skinner: Partial Reinforcement

- What it is
  - Continuous reinforcement useful for short-term, but not long-term, positive effects
  - Occasional reinforcement better long term
  - Ratio better than interval
  - Variable better than fixed

### Skinner: Partial Reinforcement

- Applied to learning
  - Feedback should be surprising (timing-wise)

### Skinner: Partial Reinforcement

- Applied to games
  - Gambling & Lottery are examples
  - Do not make rewards too frequent
  - Switch up level of challenge a bit