Gamification 209
Prof. Diana Franklin

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?

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)

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

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
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

- 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)

- 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

- 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