CS798 Games for Health, Fall 2015
Session 1: What are "Serious" Games?
From Jane McGonigal, "Reality is Broken"
Why Games Make Us Better and How They Can Change the World

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Why games can change the world (2015 statistics from Entertainment Software Association)

- As of 2015 there are 155 million active gamers in the U.S.
- 42% of Americans play video games regularly (>=3hrs/wk).
- 44% of all gamers are women. Women age 18+ now greater proportion (33%) of all gamers than boys <=18 (15%).
- Average female game player is 43 years old. Average male game player is 35. One out of four gamers is >= 50.
- Number of active gamers by global region:
  (2013 Global Games Market Report)
  - 300 million in Europe (West and East)
  - 190 million in North America.
  - 180 million in China
  - 115 million in Latin America.
  - 75 million in India.
  - ...

McGonigal: The four defining traits of a game

- Goal:
  - The *specific outcome* that player works to achieve.
  - Focuses player attention and provides *sense of purpose*.
- Rules:
  - Place *limitations* on how player can achieve goals.
  - Encourage *creativity* and *strategic thinking*.
- Feedback system:
  - Tells player how close to goal (e.g., points, levels, score, . . .).
- Voluntary participation:
  - *Establishes common ground* for multiple people to play together.

Games versus Play—University of Alberta Coursera

- Games and play are distinct and unrelated activities.
- What makes a game a "game"?
- Games are *structured*: there is a formal system of *rules*.
  - Desirable goals.
  - Quantifiable outcome, i.e., a winning condition.
  - Require effort by players.
  - Games need not be fun! Always competitve? Voluntary?
  - Can rules be negotiable?
- Play is *unstructured*, spontaneous.
  - Outside everyday experience.
  - Johan Huizinga, famous games scholar, *Homo ludens*. "Play is older than culture".
  - "Magic circle": play delineates border between reality, play world.
- Q: Game vs play vs **work**?

What can we adapt from games to real-life situations?

- Series of following points.
- Think about games you know.

Point 1: Unnecessary obstacles

- Games challenge us with *voluntary* obstacles.
- Overcoming obstacles help us develop our *personal strengths*.

Point 2: Emotional activation

- Games enhance positive emotions through various kinds of work:
  - High-stakes (shooter games).
  - Busywork (Bejeweled, FarmVille).
  - Mental work (brain games).
  - Physical work (Wii).
  - Discovery work (exploration of strange landscapes).
  - Teamwork.
  - Creative work (Sims-like – design your own communities, civilizations).

Point 3: More satisfying work

- Games gives us clear missions and more satisfying, hands-on work.
- Satisfying works starts with:
  - Clear goal, plus . . .
  - Actionable next steps to achieving the goal.
- Having a clear goal *motivates* us to act.
- Actionable next steps ensure *progress* towards a goal.
- Ensures a *guarantee of productivity*.

Point 4: Better hope of success

- Games eliminate our fear of failure.
- Games improve our chances of success.
- If we fail, but can try again, then we still have a *mission*.
- Failure can be fun! Being *not quite good enough—yet!* can be motivating.

Point 5: Stronger social connectivity

- Games build stronger social bonds and more active social networks.
- The more time player spends interacting with social network, the more likely will generate positive emotions—*prosocial emotions*.
- Social games increased in popularity 55% from 2012 to 2013.
- Social games now account for 31% of video games played most often by the most frequent gamers (2014, 2015 Entertainment Software Association).

Point 6: Epic scale

- Games make us a part of something bigger.
- Give *epic meaning* to our actions.
- "Epic" is one of the most important concepts in making gaming experiences:
  - Memorable.
  - Empowering.
  - Inspiring.
  - ...
- A *call to collective action*.

Point 7: Wholehearted participation

- To participate wholeheartedly promotes:
  - Self-motivation.
  - Self-direction.
  - Intense interest.
  - Enthusiasm!
- Brings us back to the four intrinsic rewards humans crave:
  - Stronger social connections.
  - More satisfying work.
  - More meaningful experiences.
  - Better hope of success.

Case study: Quest to Learn

- http://q2l.org
- The world's first game-based public school:
  - From: http://middleschool.q2l.org/curriculum/
    "Mission critical at Quest is a translation of the underlying form of games into a powerful pedagogical model for its 6-12th graders."
- Video: http://middleschool.q2l.org/curriculum/mission-lab/

Point 8: Meaningful rewards (when most needed)

- Games make us feel rewarded for making our best effort.
  - Games give a feeling of *control*.
  - Games give feelings of *power* and *mastery*—progession towards goals, gaining more competence.
- The potential intrinsic rewards of a good game are *nonexhaustible*.

Point 9: From strangers to communities

- Games help people band together and create powerful communities:
  - Cultivate a *shared interest* among strangers.
  - Provide *common goal*.
- McGonigal's theme: A sense of community protects us from loneliness, isolation, depression.
- Quest to Learn video: "Games are a universal language".

Point 10: Activating happier habits

- Researchers call the positive relationships we have with strangers "transitory public sociality".
- Sharing the same space with friendly strangers *even for a few minutes per day* shown to:
  - Increase optimism.
  - Improve self-esteem.
  - Increase feelings of safety and connectedness to environment.
- *"When we give to others, or act cooperatively, the reward centers of the brain light up."*

Case study: Top Secret Dance Off—2012

- http://topsecret.ning.com
- Premise:
  - “An underground network of otherwise ordinary people seeking to activate the dance secret – an elusive power said to be hard-wired into our brains, and requiring highly unusual dance experiences to unlock it.”
- Participants undertake “dance quests”, e.g., dance in a crosswalk.
- Video: http://topsecret.ning.com/video/choreopower-trailer-for-top

Point 11: A sustainable engagement economy

- Compared with games, reality is unsustainable.
- *"The gratifications we get from playing games are an infinitely renewable resource."*
- Games are *intrinsically* rewarding.
- Participation in a game is its own reward because:
  - Players are invested in their progress.
  - Players want to fully explore their worlds.
  - Players take satisfaction in their community's successes.

Engaging crowds to solve world hunger: “Free rice”

- http://freerice.com
- A game to help end hunger.
  - “Hunger kills more people every year than Aids, Malaria and Tuberculosis combined.”
- Premise:
  - Players are given questions on a variety of subjects.
  - For every answer player gets right, the sponsor donates 10 grains of rice through the United Nations World Food Programme.

Pausing to recapitulate:
How games can drive player reward and incentives

- Players feel invested in the world and their character.
- Players have long-term goals.
- Players can't exploit others.
- *Rewards are intrinsic.*

Point 12: More epic wins

- We need more “epic wins” in our lives! Real-world problems are formidable.
- Games help us define awe-inspiring goals and tackle seemingly impossible social missions with others.
- Through games, we can harness the social participation of the masses.

Point 13: 10,000 hours collaborating

- Games can give us collaborative “superpowers”:
  - A superpower surpasses any previously demonstrated skill.
  - A superpower changes beliefs of what is humanly possible.
- “Collaboration superpowers” through crowdsourcing?

Final Point: Future =? Collective intelligence in games: Massively multiplier problem-solving

- Combine collective intelligence of 1000s of people.
- Example: global-scale simulations of potential future forecasts.
- Example: huge, immensely complex problems.

Case study: World Without Oil

- http://worldwithoutoil.org
- Premise:
  - Massively collaborative imagining of first 32 weeks of a global oil crisis.
  - "During the game, players worked from a shared 'alternate reality dashboard' which provided real-time data on oil prices and availability. The players used this data to inspire their own ideas about how the fictional crisis would affect them personally and play out in their part of the world."
    (Jane McGonigal, Christian Science Monitor)
  - An alternate reality chronicled online in 1500 personal blog entries, videos, voicemails, and images.
  - A serious game for the public good: Ideas about a global crisis and possible solutions.
- Video: http://worldwithoutoil.org/

Case study: Fold it!

- http://fold.it/portal
- Solving protein-folding puzzles.
- Premise:
  - Proteins come in thousands of different varieties, but all consist of a long chain of amino acids.
  - Amino acids are small molecules made up of atoms of carbon, oxygen, nitrogen, sulfur, and hydrogen.
  - Every kind of protein folds up into a very specific shape.
  - Why is shape important? Structure specifies function of the protein.
- Goal: Understanding how proteins fold can enable us to create new proteins to combat diseases caused by 'bad' or damaged proteins (e.g., HIV, cancer, Alzheimer's).
- Example: Unfolded and folded Streptococcal Protein Puzzle:
  - http://fold.it/portal/info/about

Case study to try yourself: EyeWire—A game to map the brain (still ongoing)

- http://blog.eyewire.org/about
- Goal: To map the 3D structure of the ‘connectome’:
  - “who you are is a function of the interconnectivity among the 100 billion neurons in your brain”.
- Short video: “Citizen Neuroscience”
- Longer video: Sebastian Seung, “I am my connectome”.
- Over 200,000 participants in 145 countries.
- Sign up to play the game at: http://eyewire.org