Digital Badging as a Gamified Approach to Recognizing Student Achievement

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Agenda

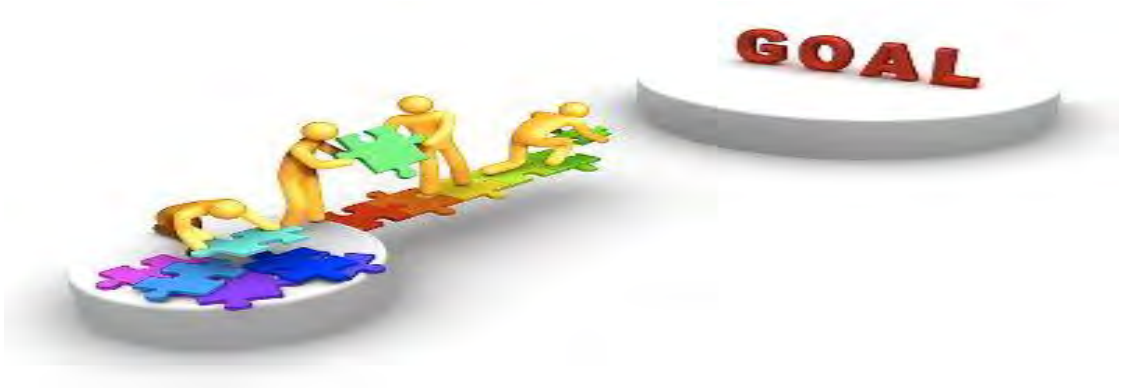
- Ice Breaker – Paper Chain Activity
- Overview of Digital Badges
- USM Badging Initiative
- Q&A
- Gamification Overview
- Your Turn: Hands-On Activities
- Q&A

Who's In the Room?

- Organization Leaders/Managers?
- Administrators?
- Department Chairs?
- Faculty?
- Course Designers?
- Instructional Technologists?
- Others?

Workshop Goals

- Provide overview of digital badges and game mechanics
- Present strategies for integrating badging into courses to recognize/represent student progress in achieving competencies
- Provide hands-on experience with rules of gamification



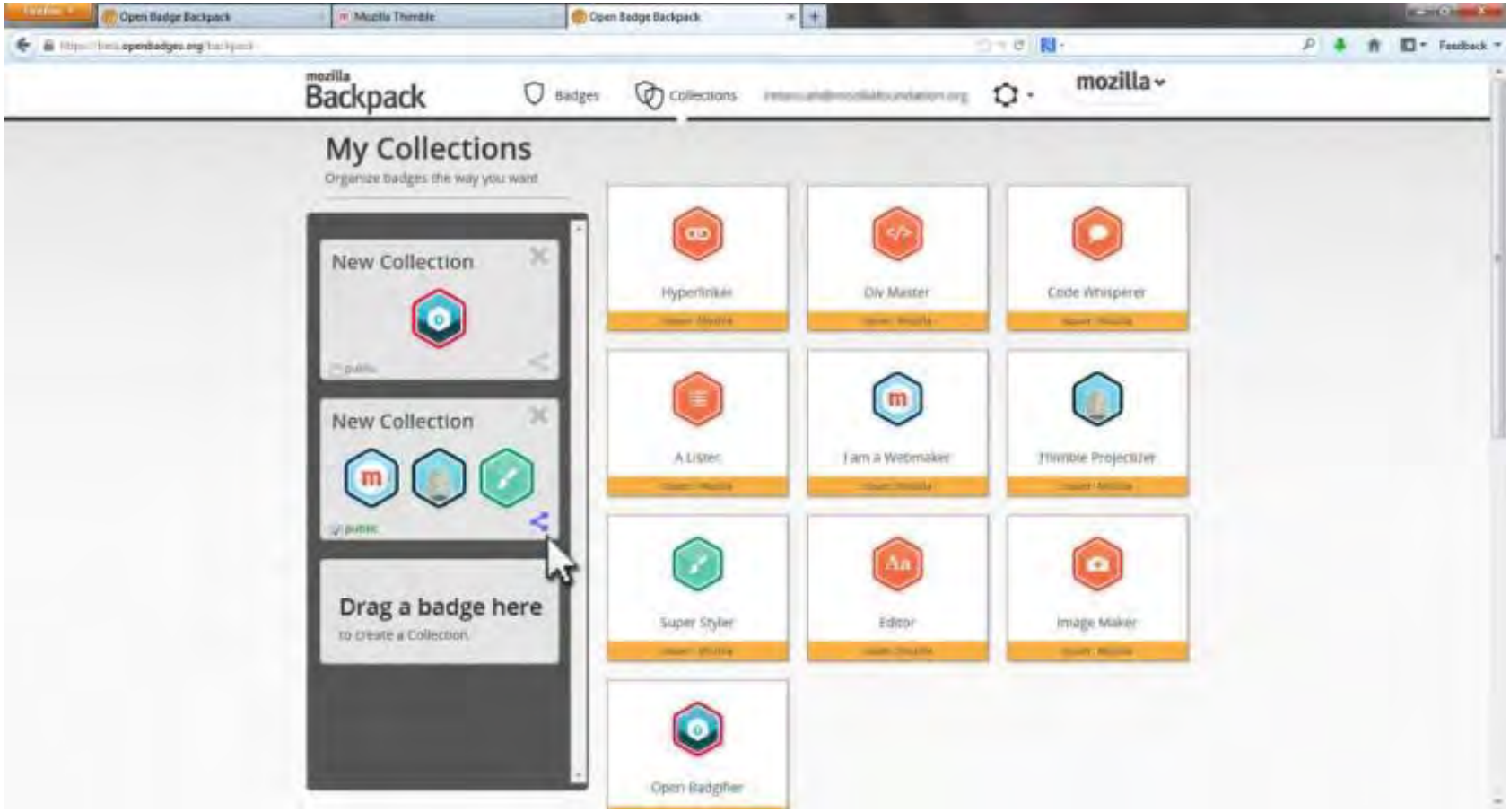
Paper Chain Activity

Digital Badges Defined

What is a Digital Badge?

- Emerged around 2011
- Transforming the way learning, skills, and accomplishments are recognized
- Allows capture, promotion, and transfer of learning that occurs in diverse contexts
- Mozilla Open Badge Infrastructure is free software that allows earners and issuers to easily collect, share, and display their badges online

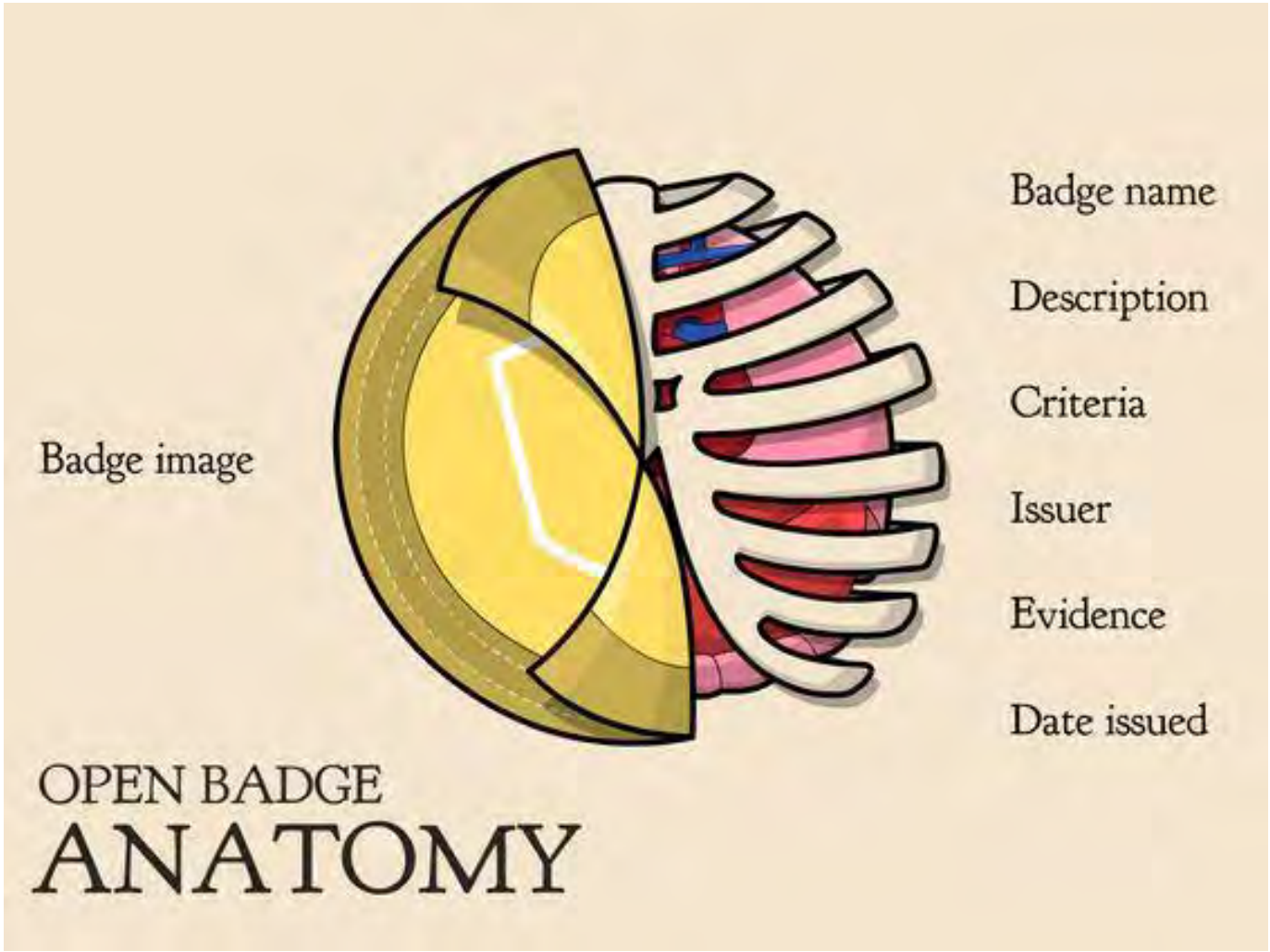
Mozilla Backpack



What is the Open Badge Standard?

- Allows person/organization to define a badge (or system of badges) to recognize achievements
- Each badge has corresponding digital image representing knowledge or skill represented by the badge
- Open Badge uses metadata attached to badge image to provide information about the badge, including:
  - Badge name
  - Description
  - Criteria
  - Issuer
  - Evidence
- Standard allows badges to be stacked, shared, combined, etc.

Badge Components

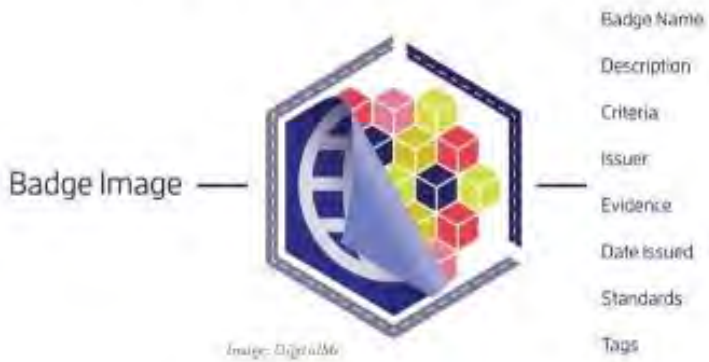


Badge Components

REINVENTING (DIGITAL) BADGES

Open Bades Technical Specification defines the metadata required for interoperability

What makes a badge?

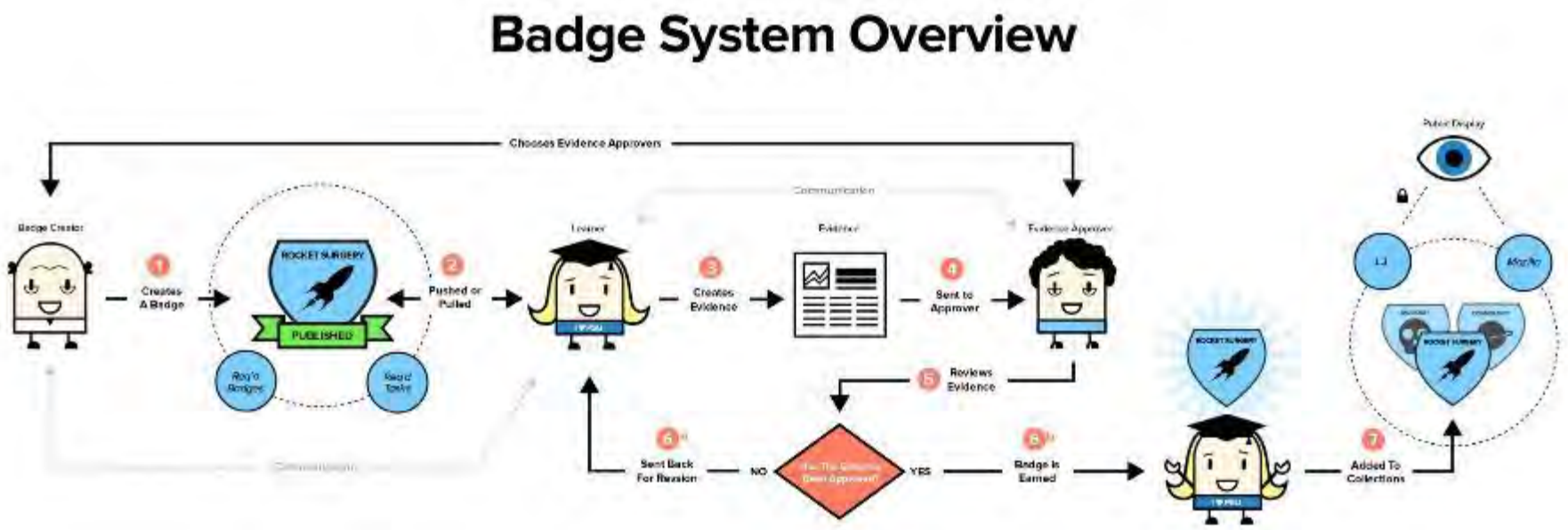


"90% of the badge system is not visual"

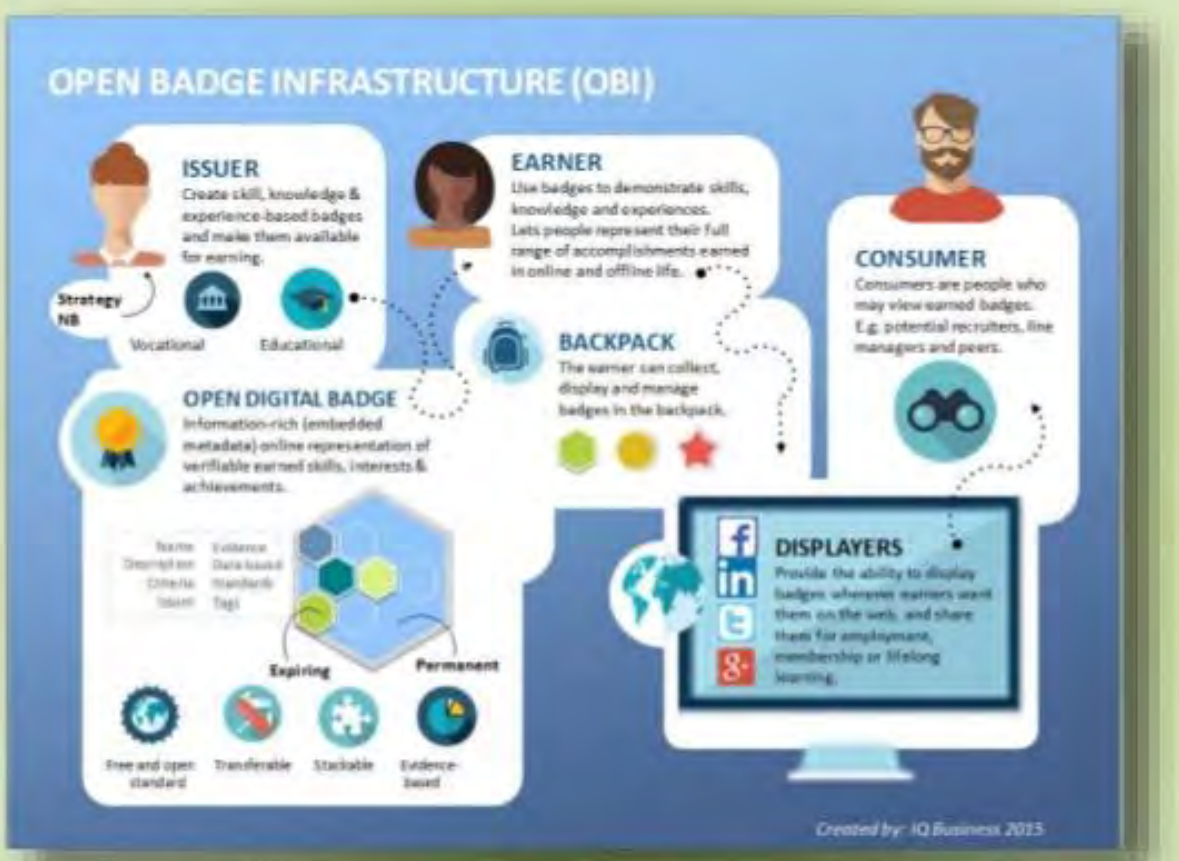
Klein, J. (2013)

Categories of Badge Functions

Workflow of a Badge



Open Badge Infrastructure



OBI Infographic

Open Badges South Africa Workgroup

Badging Applications

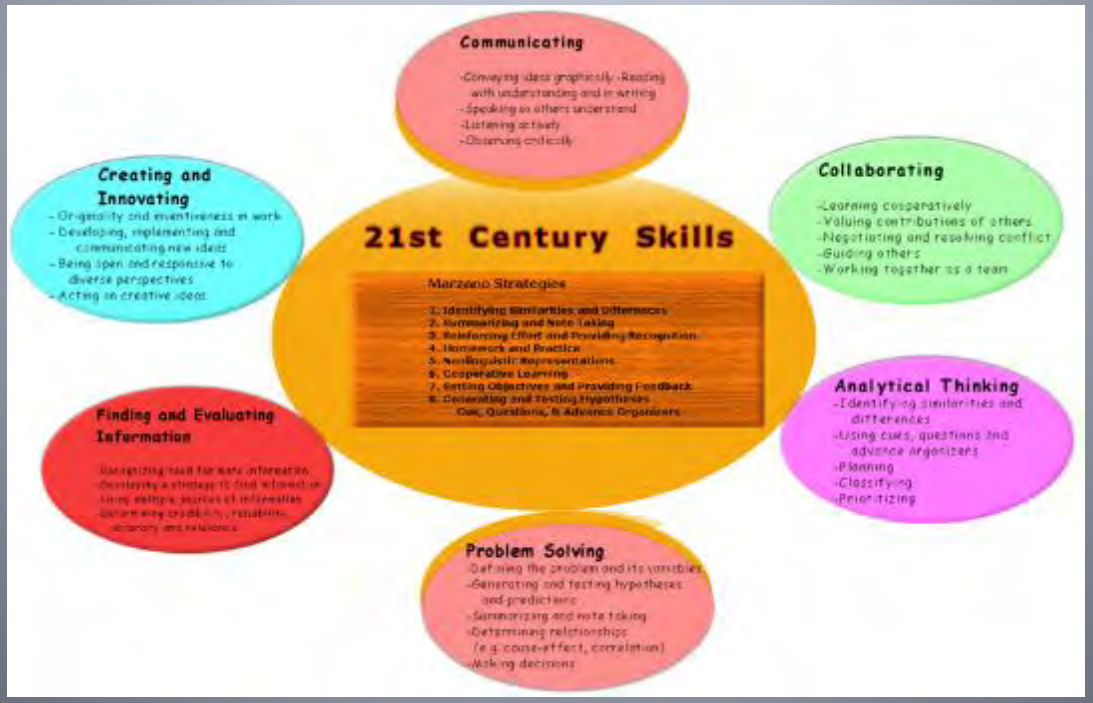
- Mozilla OpenBadges: http://openbadges.org/
- Badgr: http://info.badgr.io/
- Credly: http://www.credly.com
- Openbadges.me: http://www.openbadges.me

Where Open Badges Work Better

- where content and technology already exist
- as informal credentials
- when informally valued
- when they offer unique information
- where learning is social and networked
- where learning is competency-based

Source: Hickey, Willis, & Quick (June 2015) "Where Open Badges Work Better"

Badging Co-Curricular & 21st Century Skills

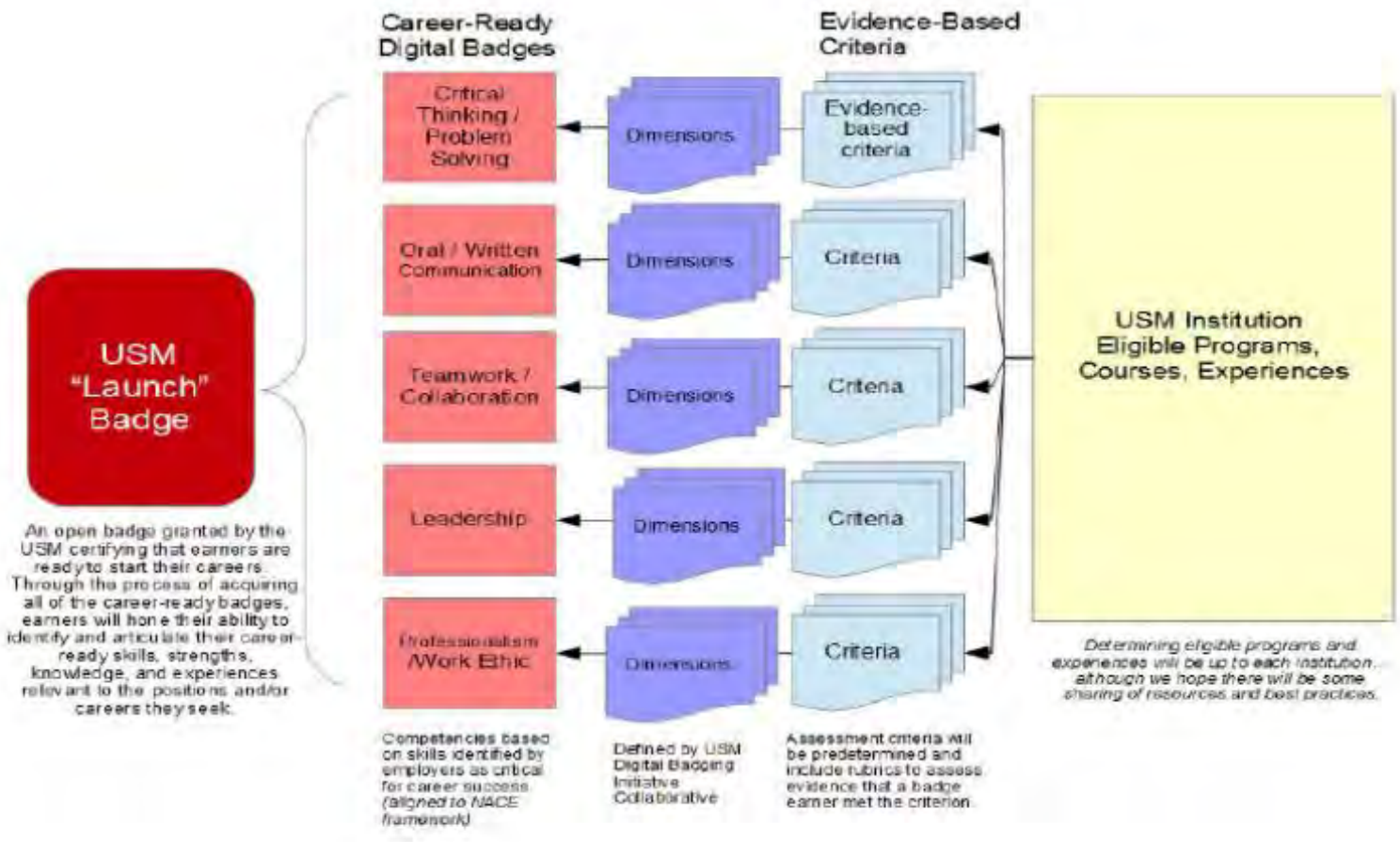


USM Badging Initiative

- Goal is to badge co-curricular, 21st Century skills identified by employers and important for entry to workforce
- Skill areas include teamwork and collaboration, communication, critical thinking, leadership, and professionalism
- Each school identifies existing program(s) around which badging program can be built based on selected skill area
- Criteria for achievement and related activities identified
- Plan for evaluation created
- Strategy for awarding badge defined
- USM Approval of badge design and evaluation approach for badge to be in USM Badge Ecosystem

USM Badging Initiative

Figure 2. Proposed USM Digital Badge System



Gamification and Badges

Evaluation and Course Grade

Your final grade for this course is based on your earnings out of a possible $100,000 in commissions:

Weekly Memos	$2,000 each, but only your first, last, and other best eight out of twelve count
Projects	$10,000 each, three across the semester (see Important Dates for deadlines)
Midterm Exams	$7,500 each, four across the semester (see Important Dates)
Final Exam	$15,000 (held as scheduled by registrar; see Important Dates)
Professionalism	$5,000 (for attendance, safety, and interactions inside/outside class)

Earnings of $85,000 are the equivalent of a guaranteed A in this course. $75,000 is guaranteed a B and $65,000 is guaranteed a C. It is possible but not certain that the grade conversion for an A or a B will be altered slightly in your favor. The cutoff for a passing grade of C is much more likely absolute.

evel 5.

Current Level: 5

To be in level 5, you must have at least 100 XP but less than 200 XP in total. This achievement is replaced by Level 6.

Current Level: 6

To be in level 6, you must have at least 200 XP but less than 300 XP in total. This achievement is replaced by Level 7.

Current Level: 7

To be in level 7, you must have at least 300 XP but less than 500 XP in total. This achievement is replaced by Level 8.

Current Level: 8

To be in level 8, you must have at least 500 XP but less than 699 XP in total. This achievement is replaced by Level 9.

Q&A

Presented by Larisa Odessky PharmD
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University of Maryland, Baltimore

Gamification

Objectives

1. Understand appropriate uses of gamification
2. Review gaming terminology and history of gamification
3. Illustrate differences between simulated games and simulations
4. Give examples of gamification
5. Identify various gamification elements and mechanics
6. Develop an initial concept for gamification initiative

What is Gamification???

https://www.youtube.com/watch?v=2lXh2noaPyw

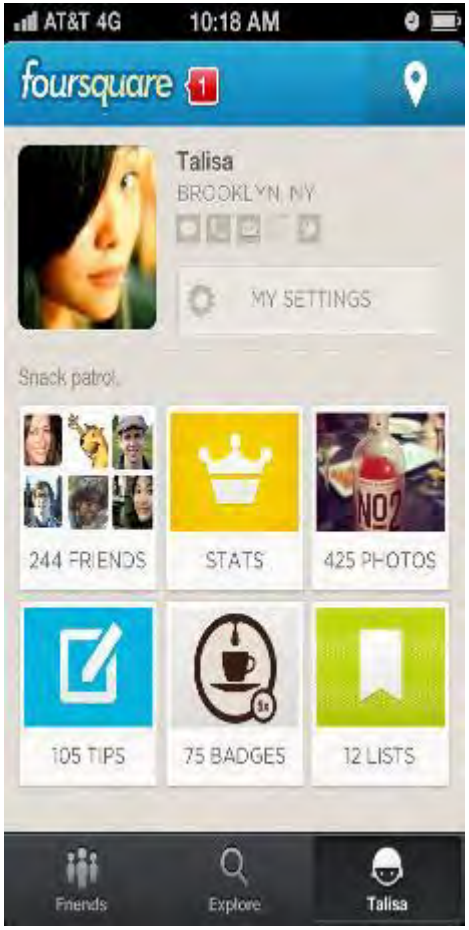
What is Gamification?

- Gam·i·fi·ca·tion
  - The application of typical elements of game playing (e.g., point scoring, competition with others, rules of play) to other areas of activity
- Game
  - Abstract challenge
  - Defined by rules
  - Interactivity
  - Feedback
  - Results in quantifiable outcome eliciting an emotional reaction

Koster, R. (2005). *A theory of fun for game design*. Scottsdale, AZ: Paraglyph Press, p.34

https://s-media-cache-ako.pinimg.com/564x/30/c8/e1/30c8e1da744b5e2268a2946500aba3cb.jpg

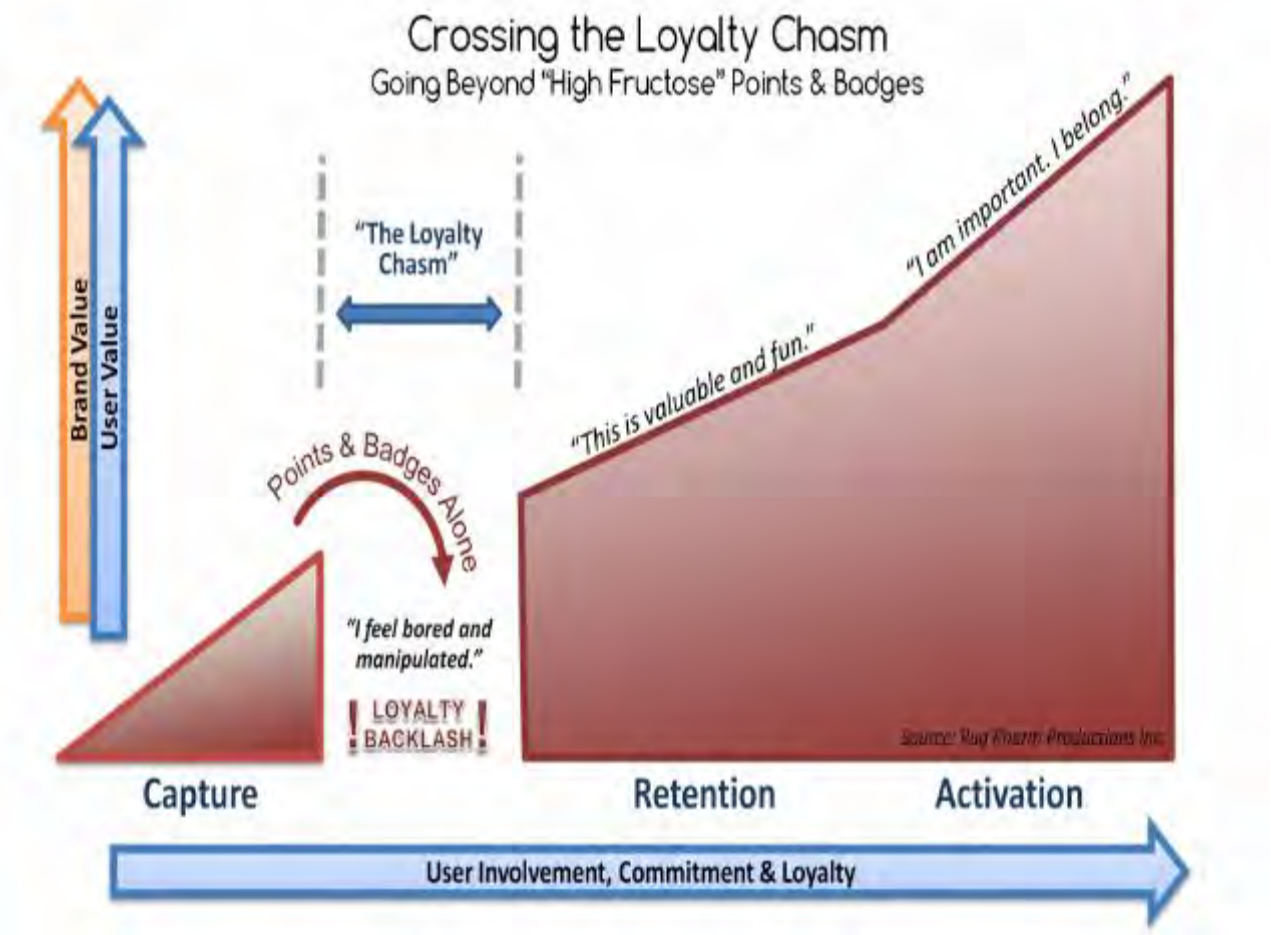
The cautionary story of Foursquare



http://www.forbes.com/sites/tomiogeron/2012/06/07/foursquare-revamps-with-more-social-content-business-ratings/#13c134d27ec8

What happened?

- Foursquare users fell into the "Loyalty Chasm"



http://www.epicwinblog.net/2013/04/epic-interview-gamification-present-and.html

- What is NOT Gamification
  - Badges, points and rewards ALONE
  - Trivialization of learning
- When Not to use it
  - Start-end task/activity not defined
  - The motivation is already present
  - Not creating / increasing happiness

Kapp, K. M. (2012). The gamification of learning and instruction: game-based methods and strategies for training and education. John Wiley & Sons.
http://www.epicwinblog.net/2013/04/when-not-to-use-gamification.html

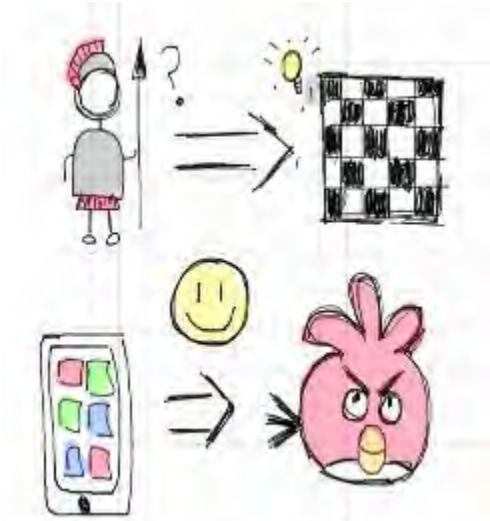
Gamification Terms

- **Aesthetics** – art, beauty and visual elements of the game
- **Flow** – mental state in which a person is fully immersed and focused on what they are doing
- **Mechanics** - objectives that should be pursued and what happens after performing each action
  - Objects
  - Actions
  - Rules

http://playwithlearning.com/wp-content/uploads/2012/02/cogs.jpg

History

- First Game evidence – 3500 BC
- Military
  - Strategy and critical skills
    - US Army - America's Army game
- *"In the past, games were used as a way to learn the art of war, or as a distraction for small hunger periods. But in the end, they all had the same purpose, to make things funnier."*
  - Jane Mcgonigal "Reality is Broken"



http://www.mapmodnews.com/images/library/image/gaming/contest_america_army_header.jpg
http://static.giantbomb.com/uploads/scale_small/8/87790/1789972-box_socom4.png
http://www.epicwinblog.net/2013/01/gamification-beginning.html
McGonigal, J. (2011). *Reality is broken: Why games make us better and how they can change the world*. Penguin.

The "Digital Natives" Generation Factor

- Formation of learning communities
  - Online or course discussions to socialize
  - Work as teams
- Potential to help build connections
  - Academic community
  - Shy students
  - Supporting collaboration
  - Interest in course content

http://cartoonbank.ru/?page_id=29&brand=11&color=color&offset=160

Brooks, D. C. (2015). with a foreword by John O'Brien. *ECAR Study of Faculty and Information Technology*.

Prensky, M. (2001). Digital natives, digital immigrants part 1. *On the horizon*, *9*(5), 1-6.

- Happiness

– 5 factors (PERMA)

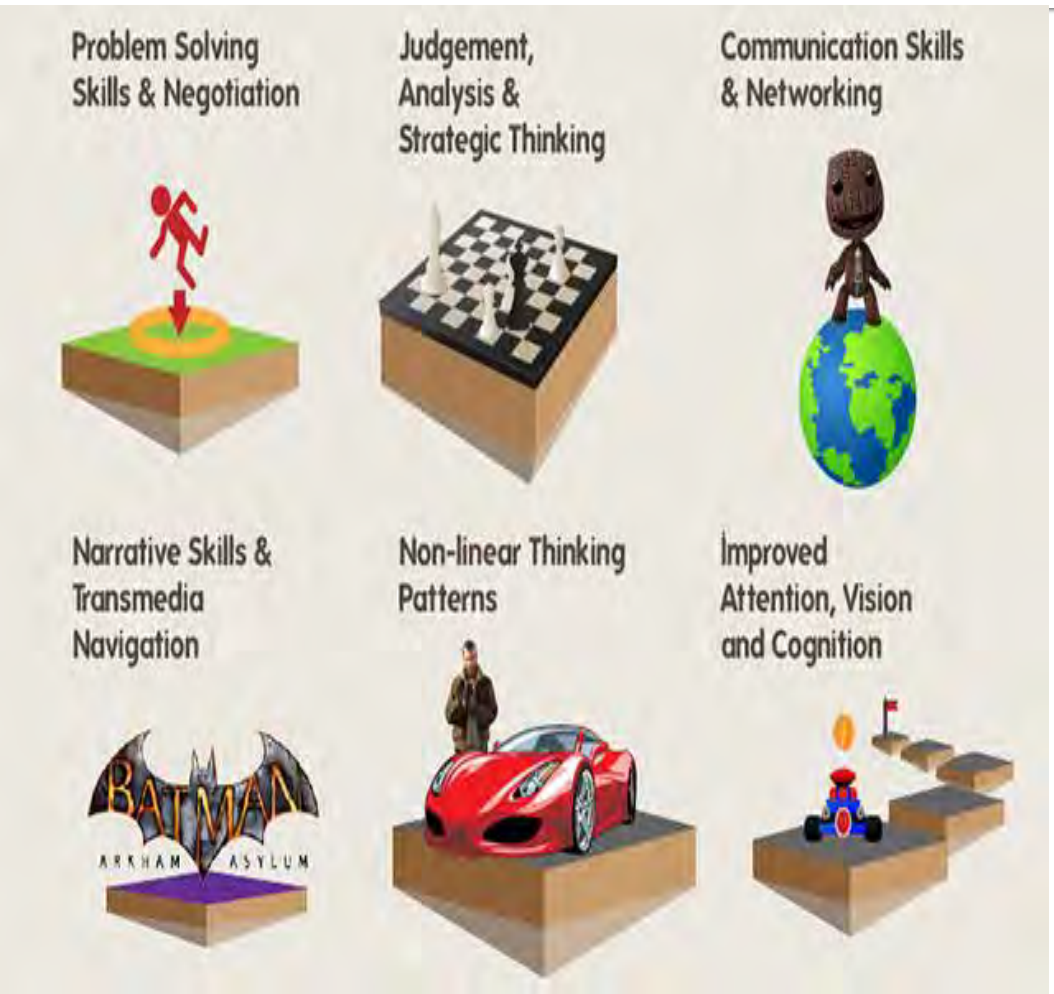
  - Pleasure
  - Engagement or flow
  - Relationships
  - Meaning
  - Accomplishments

- Motivation
  - Achievement
  - Immersion
  - Competition
  - Cooperation

Kapp, K. M. (2012). The gamification of learning and instruction: game-based methods and strategies for training and education. John Wiley & Sons.
Pink, D. H. (2011). *Drive: The surprising truth about what motivates us*. Penguin.
http://www.epicwinblog.net/2013/02/playing-to-happiness-part-1.html
Seligman, M. E. (2012). *Flourish: A visionary new understanding of happiness and well-being*. Simon and Schuster.

Games as Tools for Learning

- Lead to better understanding of concepts and ideas
- Enhanced motor skills
- Increased declarative and procedural knowledge
- Improved problem solving abilities

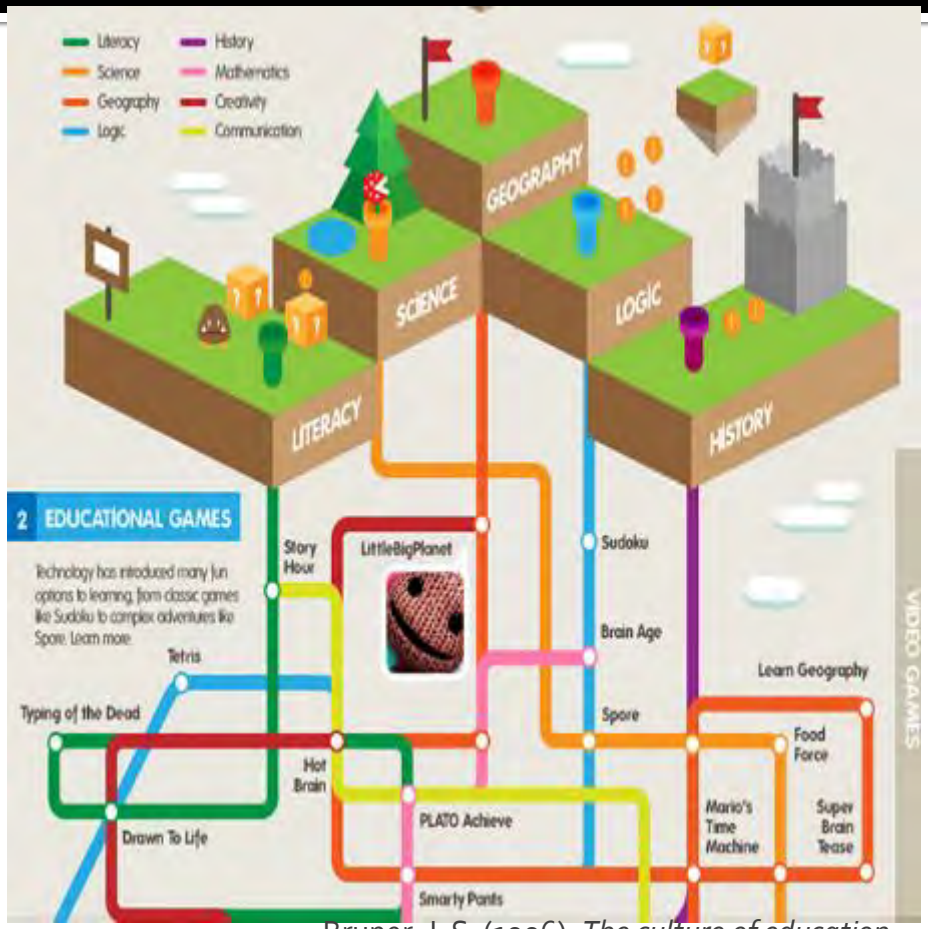


http://www.avatargeneration.com/2012/11/how-video-games-are-changing-education

Kinzie M and Joseph D. 2008. *Educ Technol Res Dev.* **56**(5/6): 643-663.

Games as Tools for Learning

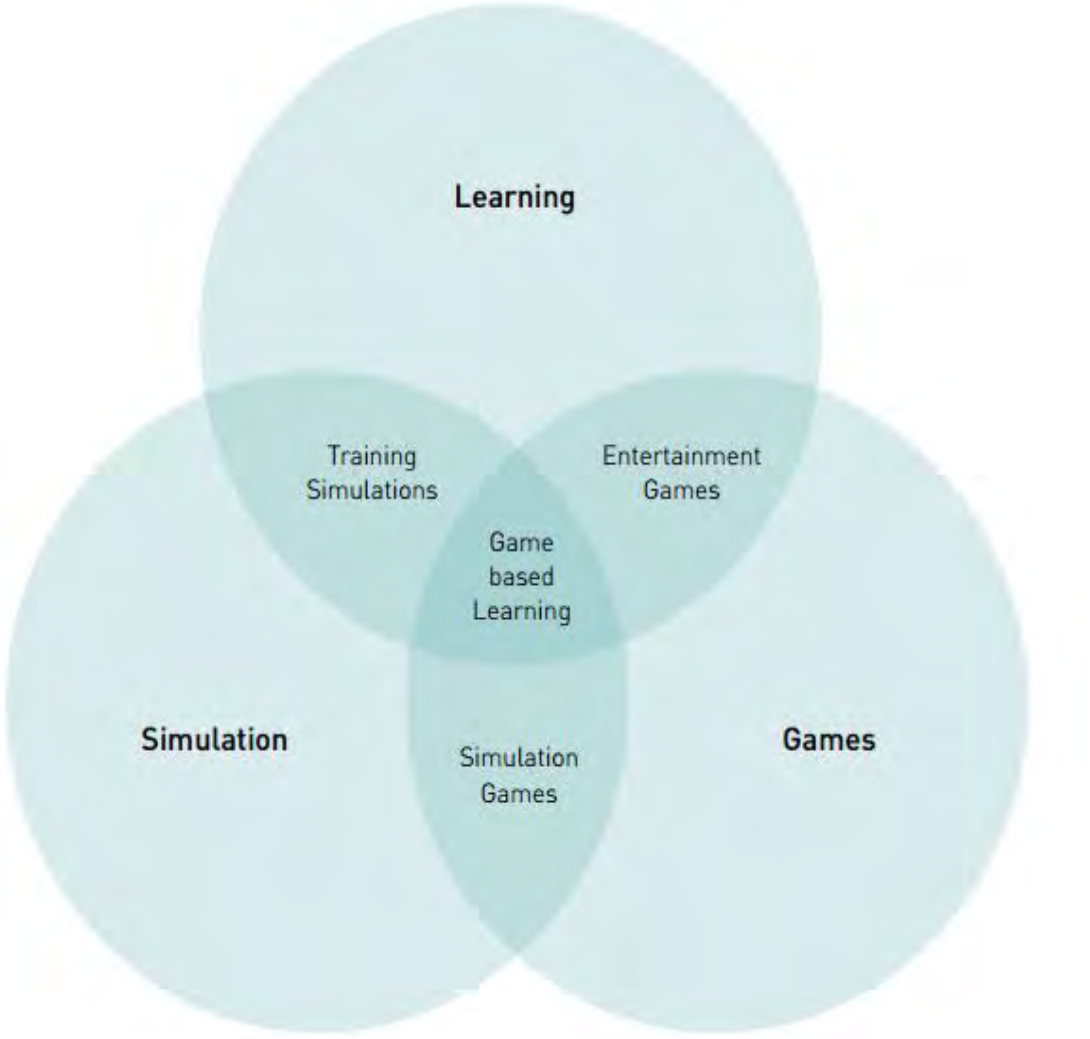
- Take learning from a passive experience to an active and engaging learning process
- Development of players own meanings
- Experience and learn failures in a safe environment
- Increased motivation and creativity



Bruner, J. S. (1996). *The culture of education*. Harvard University Press.

http://visual.ly/how-video-games-use-education-and-learning-elements

How does this all fit together?



Martens, A., Diener, H., & Malo, S. (2008). Game-based learning with computers–learning, simulations, and games. In *Transactions on edutainment I* (pp. 172-190). Springer Berlin Heidelberg.

Simulation vs Simulated Games

FLIGHT SIMULATION

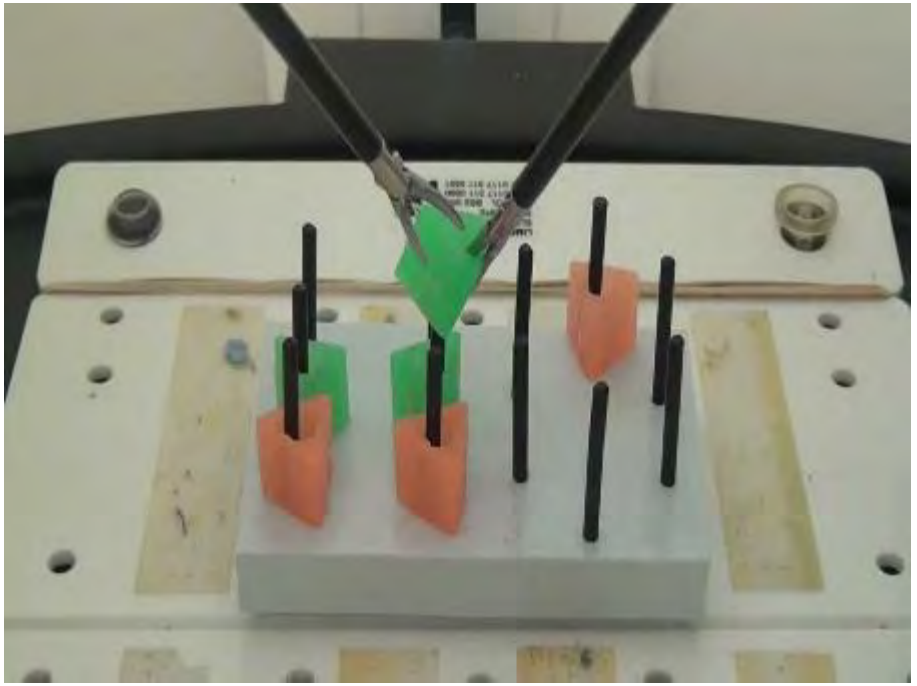
- Improve performance
- Goal oriented
- Competency based

COMBAT WINGS SIMULATED GAME

- Artificial consequences
- Unrealistic environment
- Fun

http://i.telegraph.co.uk/multimedia/archive/01440/simulator-ap-460_1440305c.jpg

Laparoscopy and Robotic surgery



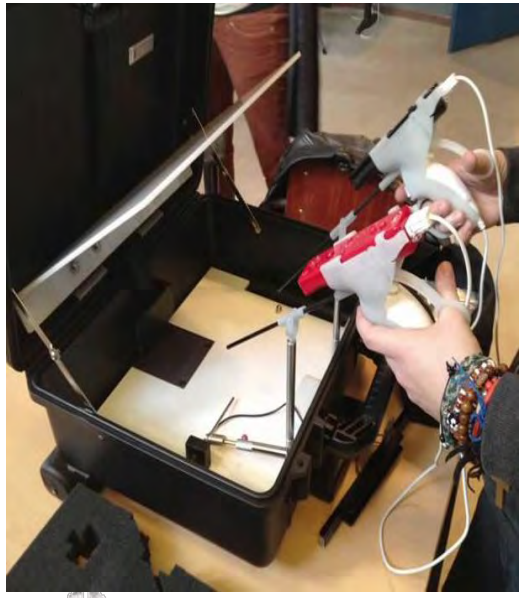
https://gidradiodotcom.files.wordpress.com/2013/04/surgery.jpg
http://www.undergroundthegame.com/
https://i.ytimg.com/vi/p3BGNkC-F_0/maxresdefault.jpg
https://www.youtube.com/watch?v=rm8YpSUXnDk

The Underground Game

- https://www.youtube.com/watch?v=rm8YpSUXnDk

The Underground Game

- Surgical residents and medical students playing specific video games actually **did better** on laparoscopic simulators
  - **37 %** fewer errors
  - **27%** faster
  - **42 %** better on laparoscopic surgery and suturing drills



Educational Serious Games

- Primary purpose is education and not pure entertainment
- Consist of solving problems in real world environment or simulated virtual world
- Achieve a goals by getting players engaged in the game

http://www.avatargeneration.com/2012/08/spend-on-serious-games-growing-steadily/
Chen, S., & Michael, D. (2005). Proof of learning: Assessment in serious games.

Gamification Projects

- ClassDojo
  - Improves specific student behaviors
  - Helps engagement by issuing awards and recording real-time feedback

http://blogs.clicksoftware.com/index/top-25-best-examples-of-gamification-in-business/
https://www.classdojo.com/

ClassDojo

https://www.youtube.com/watch?v=Rzzb5cmNoco

Gamification Projects

- Proof
  - Motivation and goal tracking
  - Users create 7-day challenges
  - Capture photo or video proof using smartphones to track progress
  - Prove that the challenge was completed

http://www.mindbloom.com/proof

Proof

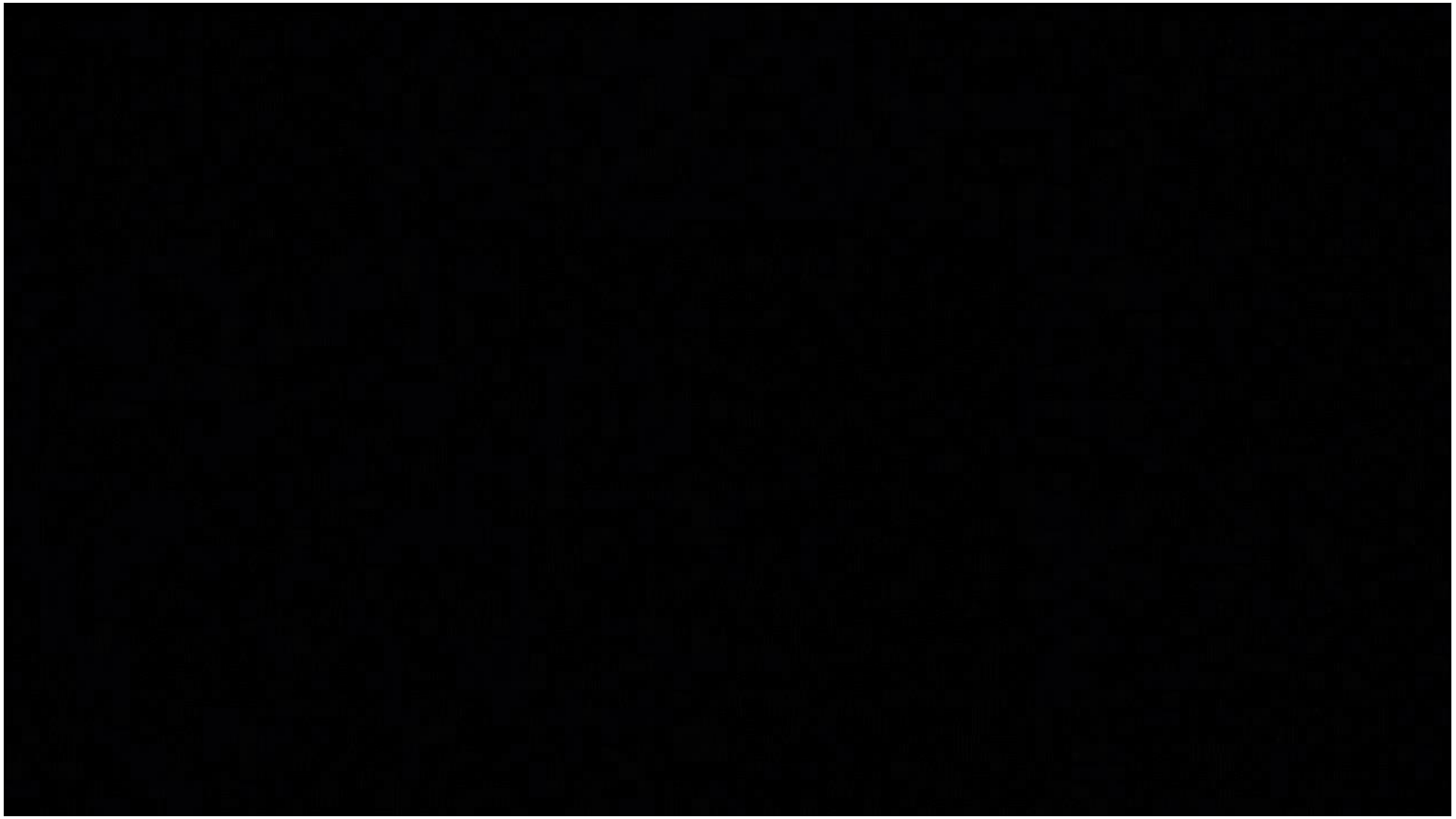
- https://vimeo.com/62320159

Gamification Projects

- DuoLingo
  - Learn a language while translating the web
  - Earn skill points when lessons are completed or web content is translated

https://www.duolingo.com/
http://www.windowsmode.com/wp-content/uploads/2016/03/Duolingo-Download-Free.jpg
https://www.youtube.com/watch?v=WyzJ2Qq9Abs

DuoLingo



https://www.youtube.com/watch?v=WyzJ2Qq9Abs

Gamification Success Stories

- Foldit

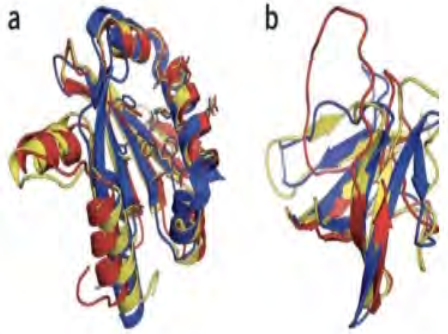
TIME

Online Gamers Solve a Tricky AIDS Puzzle

By Meredith Melnick @meredithcm | Sept. 19, 2011

Who says you need a biochemistry degree to engineer an AIDS breakthrough? As our colleague Matt Peckham wrote on Techland, a bunch of online gamers have managed to crack a puzzle that AIDS researchers have been trying to solve for years.

Online Foldit players figured out the structure of a retroviral protease, a type of protein that is crucial to the replication of HIV. In this case, gamers worked on the protein that allows the Mason-Pfizer monkey virus (M-PMV) to progress into simian AIDS in rhesus monkeys. Legitimate scientists have tried unsuccessfully to model the protein; Foldit players working in concert were able to "solve" the structure in a matter of weeks.

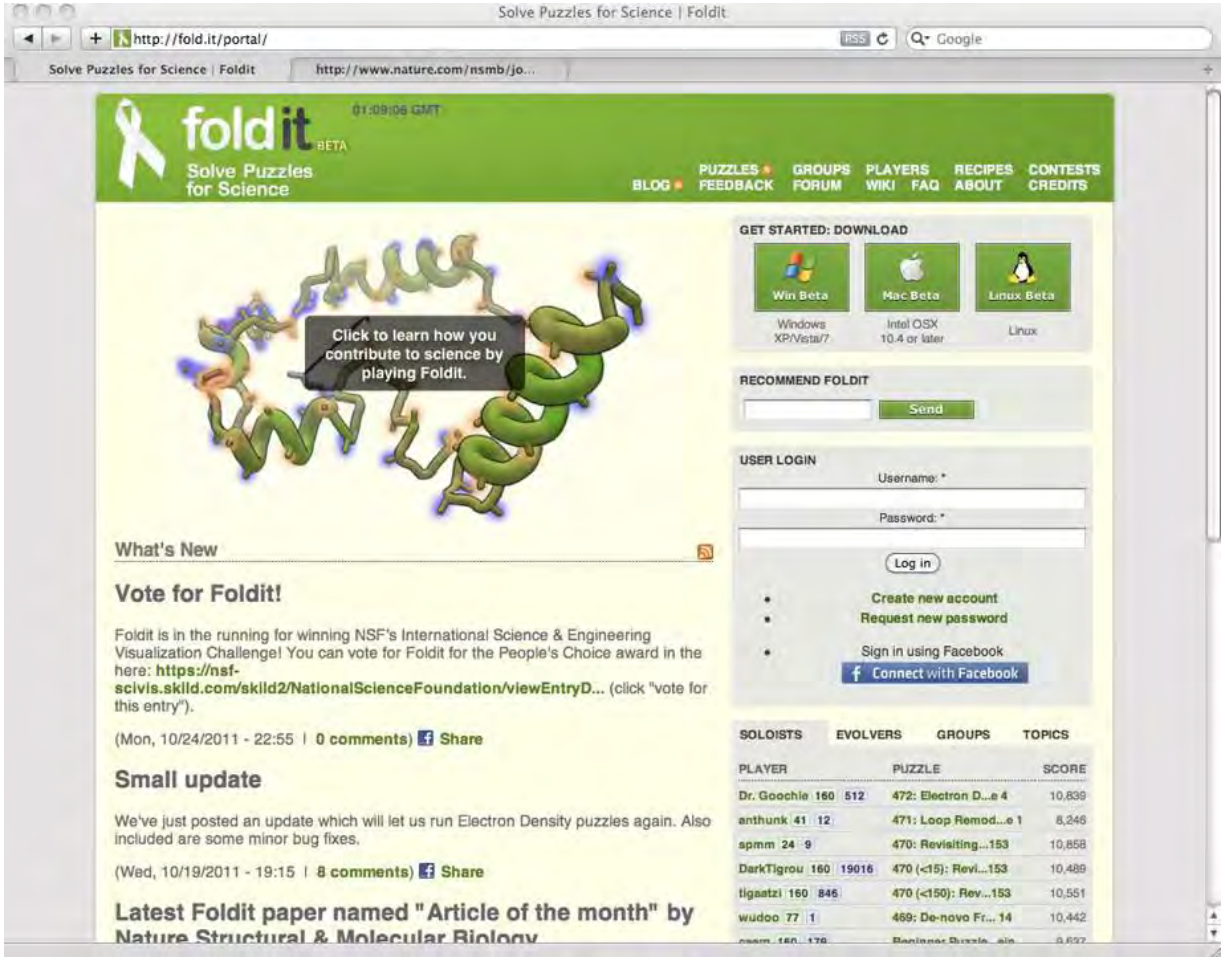


Getty Images

http://www.gamesforchange.org/play/foldit/

http://healthland.time.com/2011/09/19/online-gamers-solve-a-tricky-aids-puzzle/

FoldIt



https://www.youtube.com/watch?v=bo99JjnfdA8

Q&A

BREAK (10 minutes)

Workshop

All materials were adopted from the following sites, for more information please go to:

www.gamificationbook.com

http://www.epicwinblog.net/

- Interviews, questionnaires
- 5 'whys'
- Observation
- Diary studies
- Mental map
- User's daily activities
- Empathy maps
- Stakeholder maps

Vianna, M., Vianna, Y., Adler, I., Lucena, B., & Russo, B. (2012). Design thinking: Business innovation (B. Murtinho Trans.).

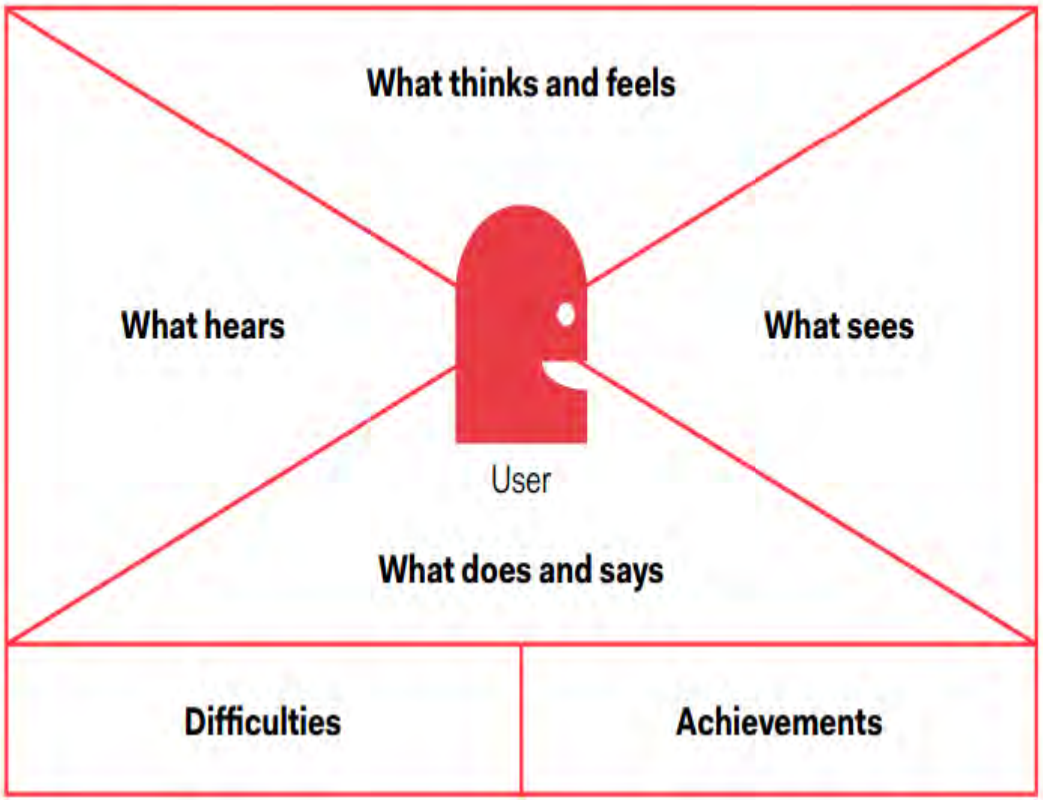
Step 1 **Understand the problem and the context**

- Mind map
  - Diagram conceived to organize thoughts in a visual and textual manner
  - Helping to view different themes
  - Enabling connections between

https://benmayfield.files.wordpress.com/2011/09/genre-mind-map.png

Step 1 Understand the problem and the context

- **Empathy map**
  - Synthesis of information about the user
  - Identify what they says, feel and thinks



Step 1 Understand the problem and the context

Activity (4 min)
Create a map of problem/s that can be approached by the badging gamification

Step 2 Understanding the players

- **Generation**
  - **Baby Boomer** (1946 to 1964)

    - Competition, hierarchical systems

  - **Gen X** (1965 to 1976)

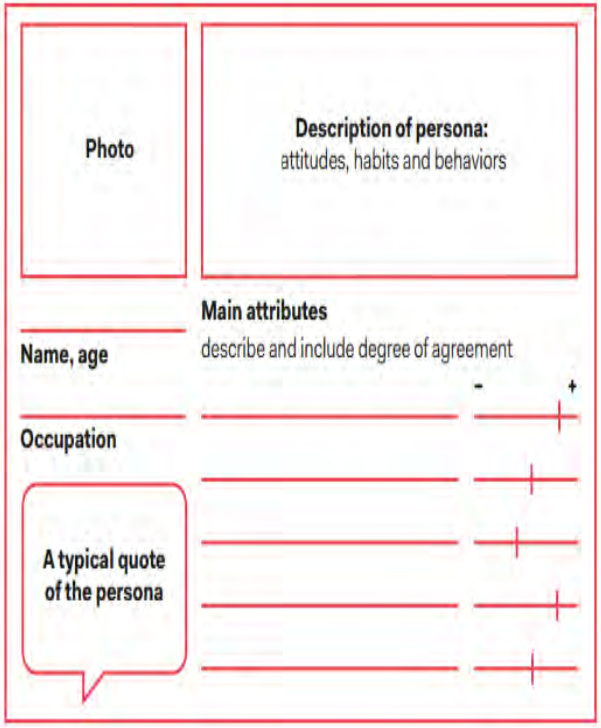
    - Pragmatic, individualistic, and does not tolerate failure

  - **Gen Y/ Millennial Generation** (1977 to 1995)

    - Immediate feedback, like collaboration

  - **Gen Z or Centennials** (1996 and later)

    -Multi –tasking, hyper-aware, technology-reliant



Players: Age and Gender

- Probable time of dedication
- Level of interest in the topic
- Game platform

Men

- spatial/three-dimensional puzzles
- trial and error
- competition
- destruction
- mastery

Women

- dialog and verbal puzzles
- learning by example
- real world situations
- nurturing
- emotion

Age – related games

0-3	Toy attraction
4-6	Awake of interest in games
7-9	The age of reason: becoming very interested in game playing
10-13	The age of obsession
13-18	Plenty of free time to play and strong gender differences
18-24	Playing less than when teenagers, but have different preferences
25-35	Focused in professional/family issues, less time to play
35-50	Family oriented, casual game players
50+	Plenty of free time, games become socializing activity

Activity 2: Identify your player (2 min)

Generation:

Gender:

Age:

Educational Level:

Step 2 Understanding the players

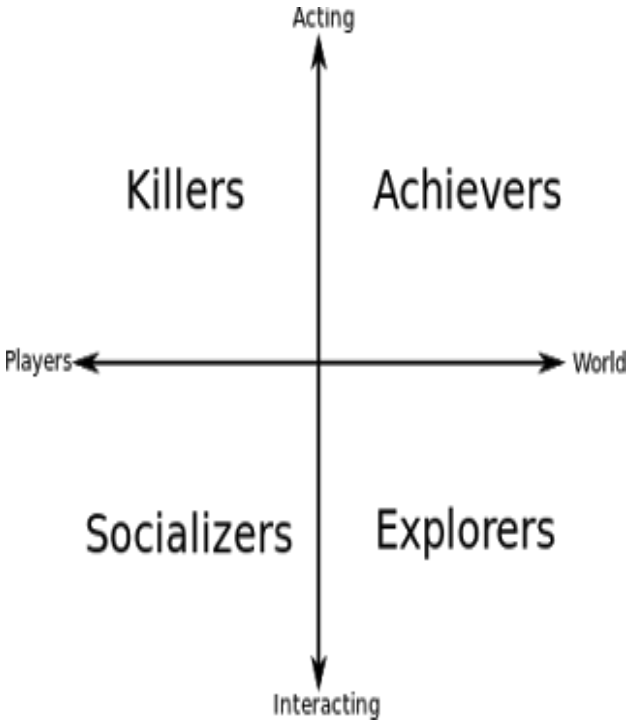
Type of Players

- **Killers** - gets into competition, motivated only to defeat the competitors

- **Achievers** - appreciate the constant feeling of victory

- **Explorers** - interested in discovering the whole game's possibilities and why

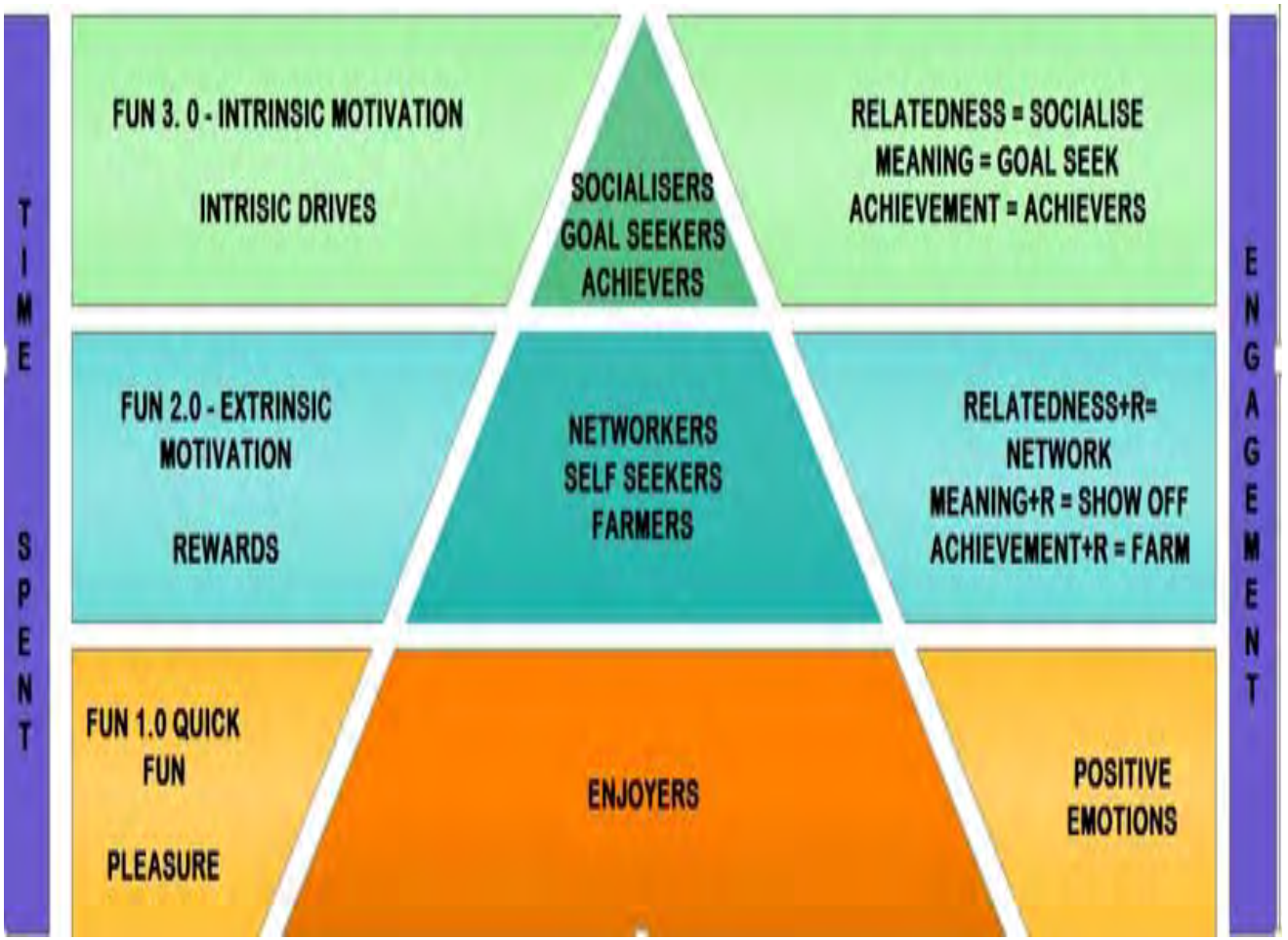
- **Socializers** - see games as an opportunity for social interaction



http://www.epicwinblog.net/2013/04/gamification-player-types-t-e-piramid-i.html

Step 2 Understanding the players

Time Engagement Pyramid



http://www.epicwinblog.net/2013/04/gamification-player-types-t-e-piramid-i.html

Step 2 Understanding the players

Fun 3.0 – Nike +

- Start Goal
  - To start running, train and improve
- End Goal
  - Running to be part of something bigger than ourselves, community
  - Sharing the results with our people

Step 2 Understanding the players

- Enjoyer → Quick Fun
- Farmer → Achievement
- Self-Seeker → Meaning
- Networker → Relatedness

Schell, J. (2014). *The Art of Game Design: A book of lenses*. CRC Press.

Step 2 Understanding the players

https://lh4.googleusercontent.com/-wLDL5bCoI1U/AAAAAAAAAAI/AAAAAAAACkA/arnrMv4M_vw/photo.jpg
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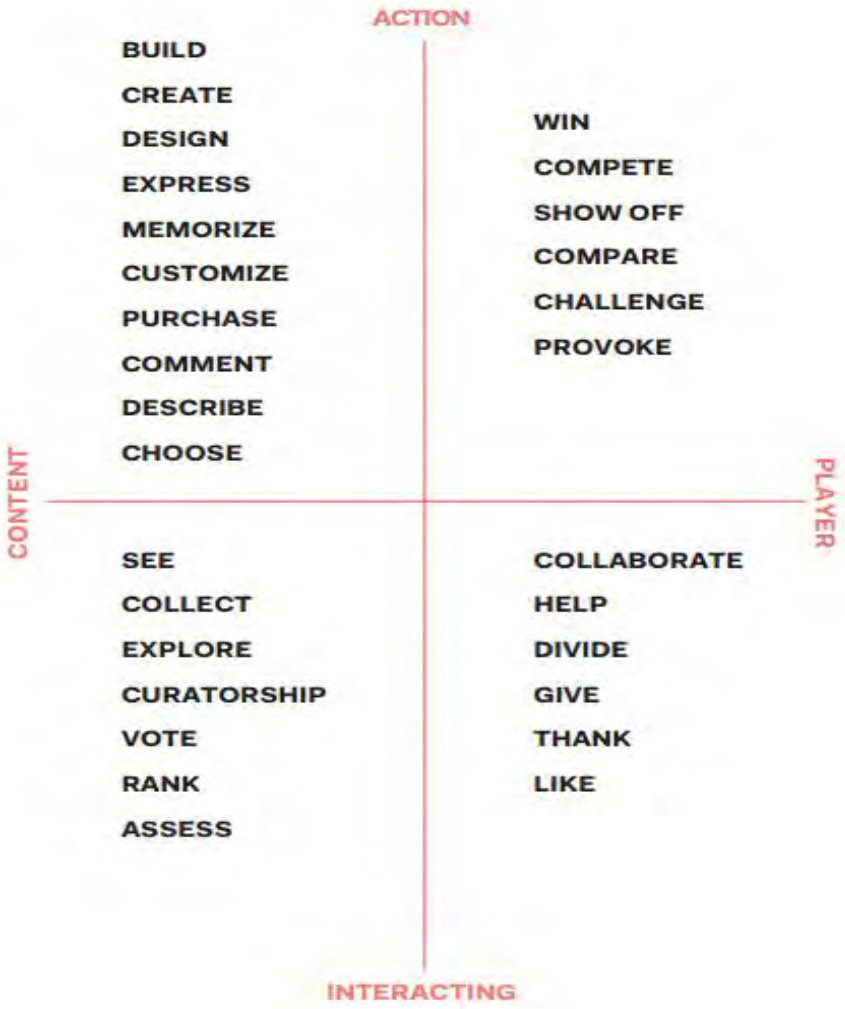
https://s-media-cache-ako.pinimg.com/originals/b2/80/f4/b280f4678126a3fad149bfedbe8b6450.jpg
http://www.epicwinblog.net/2013/05/gamification-player-types-meet-players.html

Step 3 **Guiding criteria and game mission**

- Main mission of your gamification initiative
- Goals clearly reachable outlined actions
- Examples of goals:
  - To activate cooperation
  - Stimulate information exchange among players

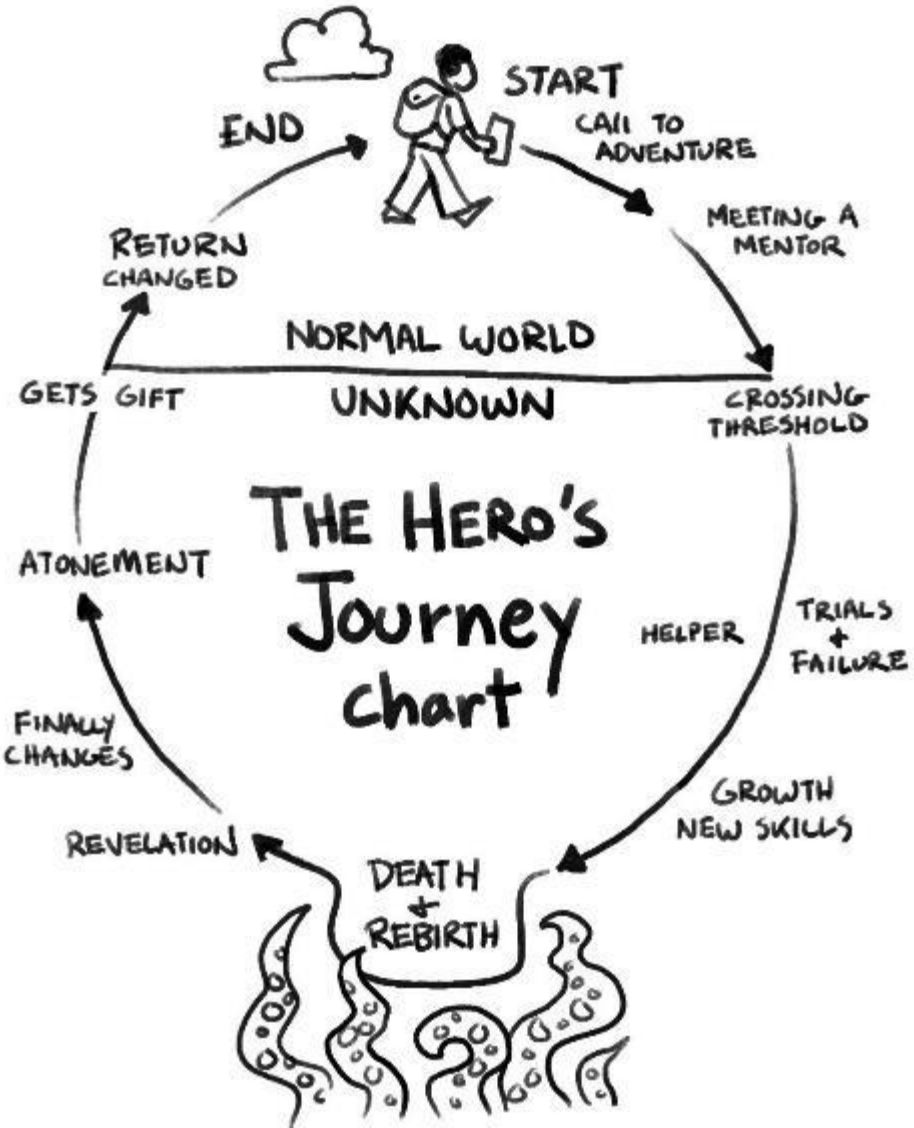


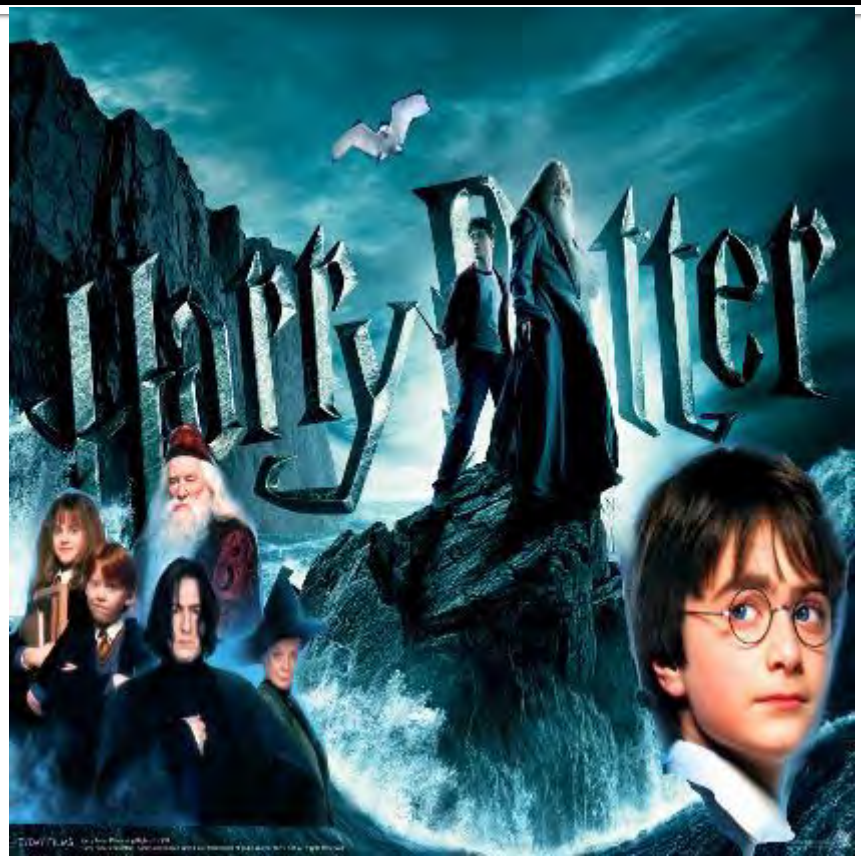
Activity 3:
Create a mission using the table (4 min)

Step 4 **Develop ideas for the game**

- **Pros**
  - Fulfils honor and idealism
  - Creates epic meaning, comradeship, justice,
- **Cons**
  - Involve great effort in designing and powerful story
  - Requires long periods of time for creation and testing
- **Players**
  - All

Hero's Journey





https://designingsomething.files.wordpress.com/2016/04/myth.jpg
https://i.ytimg.com/vi/qBuWbN3HyMk/maxresdefault.jpg
http://www.monogramdirect.com/media/catalog/category/HP_Logo.jpg

Activity 4: (6 min)

- Story? One/ two sentences
- Aesthetics? One /two words
- Theme?
  - Hero's Journey
  - Overcoming-of-fear story
  - Reality-is-a-dream story
  - Technology gone amok story
  - Race-to-the-finish story
  - World-in-chaos/survival story
  - Mythological exploration story

https://upload.wikimedia.org/wikipedia/en/5/50/NES_Super_Mario_Bros.png

Step 4 **Develop ideas for the game**

- Story?
  - Journey to save the princess
- Aesthetics?
  - Fantasy, colorful
- Theme?
  - Hero's journey

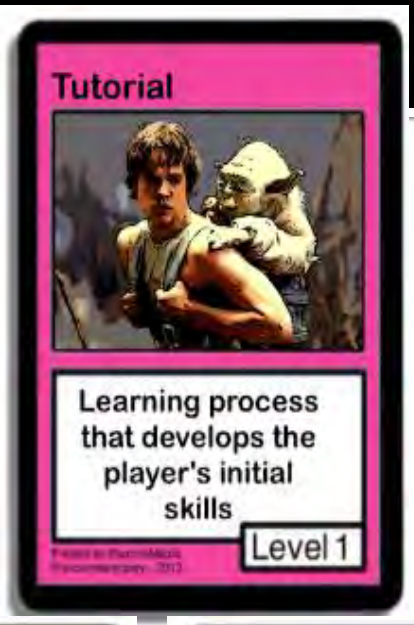
https://upload.wikimedia.org/wikipedia/en/5/50/NES_Super_Mario_Bros.png

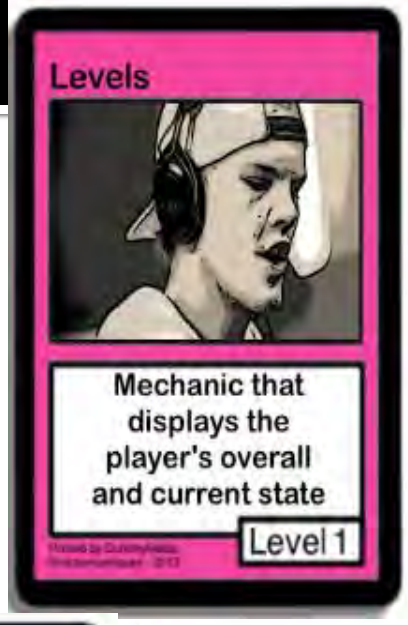
Mechanic: Avatar

- **Pros**
  - Fulfills social contact status
  - Enhances the feeling of being IN the circle
- **Cons**
  - Characters need to be fun and resonant and that might be difficult to accomplish
- **Players**
  - All

Step 5 **Definition of the game and its mechanics**

- Motivators of fun
- Duration
- Scoring
- Achievements
- Progression





More Mechanics

Lifejackets

Help players when they are stuck or in difficult moments

Experience Points (XP)

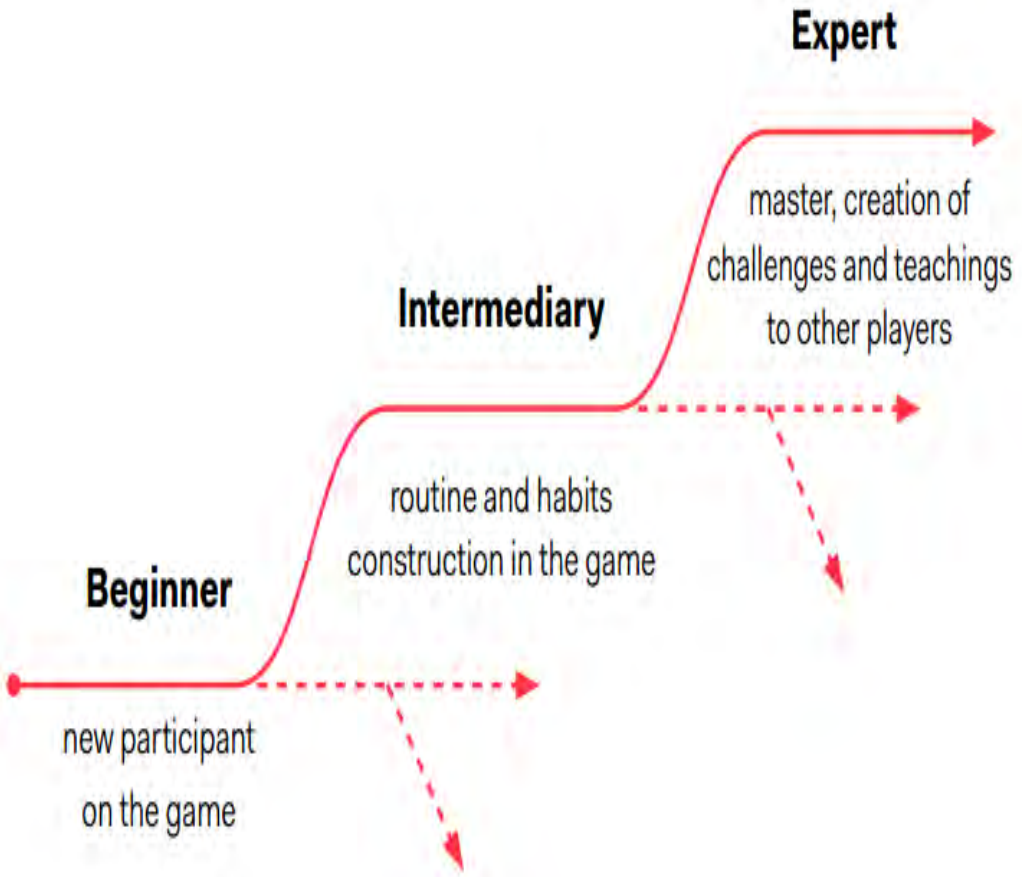
Economy points – points that can be traded for stuff

Random Rewards –

lotteries , contests

Player Skill Level

- Define initial expertise level
- How will players evolve
- Enable both beginners and experts to have levels of interaction



Schell, J. (2008). *The art of game design: A deck of lenses*. Schell Games.

Activity 5: (3 min)

- Pick a motivation
- Describe the player's Head's Up Display (HUD)

https://s-media-cache-ako.pinimg.com/originals/28/35/98/2835986d4d5237c4437c2940d58268f7.png
http://www.cocos2d-x.org/attachments/download/4801

Mechanic: World

- **Areas** –chatrooms (guild rooms)
- **Pros**
  - Fulfills curiosity and autonomy
  - Enhances the whole experience and the theme
- **Cons**
  - Too much freedom leads to confusion, needs guidance
  - Requires a powerful story
- **Players**
  - All

Activity 6

- Key locations
  - Scale
- Conditions
- Time
- Physics
- Society/culture

http://web-vassets.ea.com/Assets/Resources/Image/Screenshots/scs-commercial-city.jpg?cb=1338867364

More mechanics

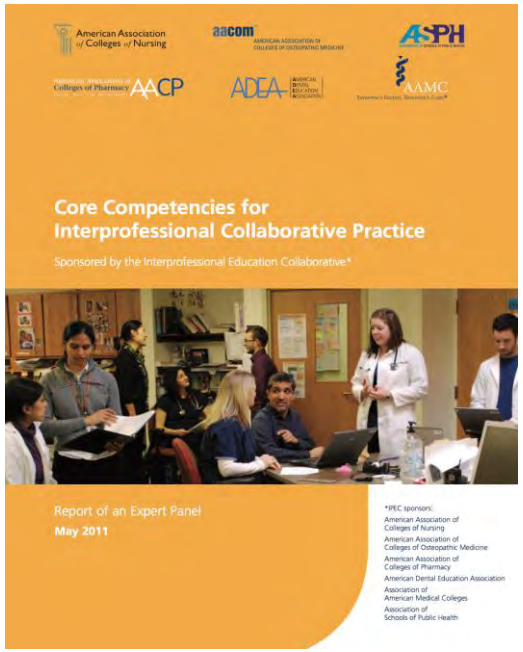
- Use measurement achievements instead of completion achievements to increase intrinsic motivation
- Reward players for boring tasks and give feedback for interesting ones
  - Complex tasks - mastery orientation
  - Simple/repetitive tasks – performance orientation
- Create a storage place for achievements and badges

Using Serious Games as an Interprofessional Education Collaboration and Teamwork Activity *Pilot Study*

Larisa Odessky, PharmD University of Maryland, Baltimore Graduate School

Interprofessional Education Collaborative (IPEC)

Interprofessional Collaborative Practice Competency Domains



- **Competency Domain 1:** Values/Ethics for Interprofessional Practice
- **Competency Domain 2:** Roles/Responsibilities
- **Competency Domain 3:** Interprofessional Communication
- **Competency Domain 4:** Teams and Teamwork

High level collaborative IPE activities barriers

Time constraint

Conflicting curriculum schedules

Financial Resources

Remote geographical locations

Multidisciplinary accreditation and validation

Pirrie Valerie Wilson R.M. Harden John Elsegood A. AMEE Guide No. 12: Multiprofessional education: Part 2 - promoting cohesive practice in health care. *Med. Teach.* 1998/01/01 1998;20(5):409-416.

American Association of Colleges of Pharmacy (AACP) Gaming Initiative

- Can serious video games provide opportunities for teamwork and collaboration that meet the expectations for IPE?
- Will students who played the educational video games as an IPE activity have positive attitudes towards the game, their teammates and interprofessional collaboration?

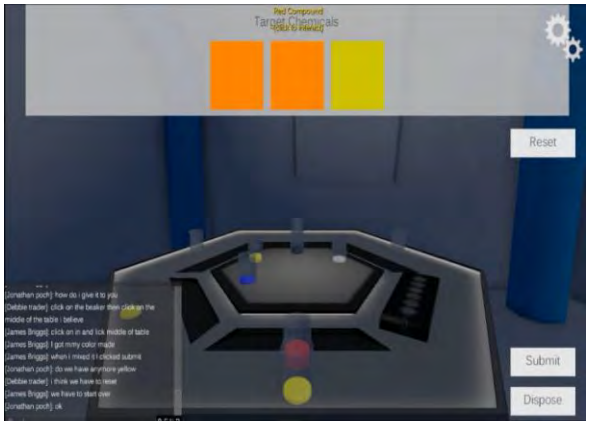
Technology to the rescue

- **Massively Multiplayer Online Games (MMO or MMORPG)**
  - Can overcome the barriers
  - Allow large number of students to play at the same time
  - Flexibility of open virtual environments (Second Life®), with the scripted high fidelity simulations
  - Can generate higher levels of positive emotional engagement
  - Are more appealing and motivating

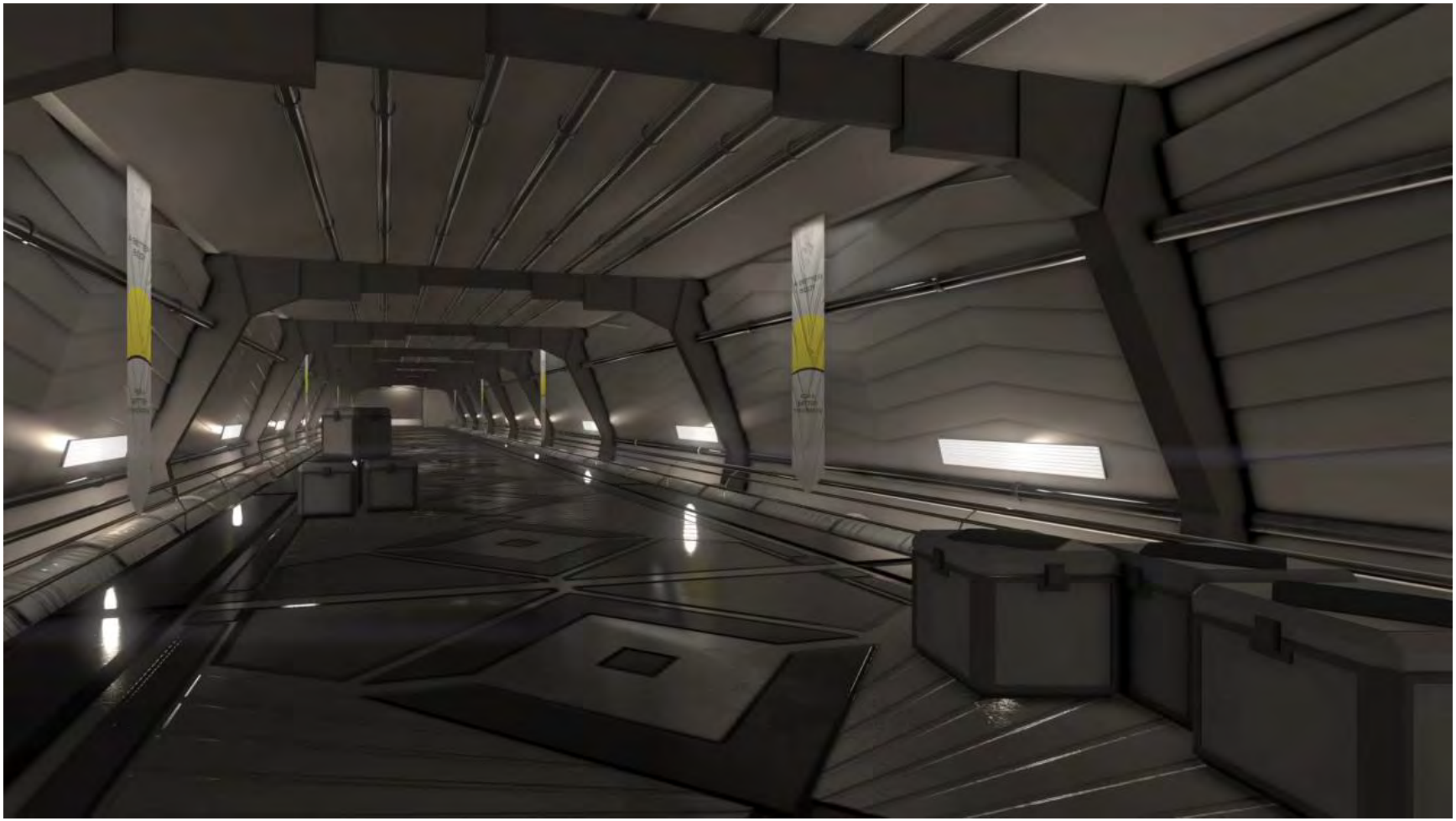
. Prensky M, Prensky M. *Digital game-based learning.* Vol 1: Paragon house St. Paul, MN; 2007.
Prensky M. Digital game-based learning. *Computers in Entertainment (CIE).* 2003;1(1):21-21.
Manninen T, Jarvela S, Hakkinen P. Learning to collaborate: Designing collaboration in a 3-D game environment. *Internet & Higher Education.* 2006;9(1):47-61.

The Game : Mimycx©
Game Level "Sick Beats"
Developed by Professions Quest LLC, a subsidiary company of the AACP

Based on interprofessional competencies	Demonstrates team and player multi tasking abilities	3 scripted multiplayer puzzle challenges



Mimycx



Challenge 1: Medical Tent

- Players simultaneously received inconsistent information from the game characters
- Encouraged cognitive conflict
- Sharing of individual information during group discussions.

Challenge 2: Water Bunker

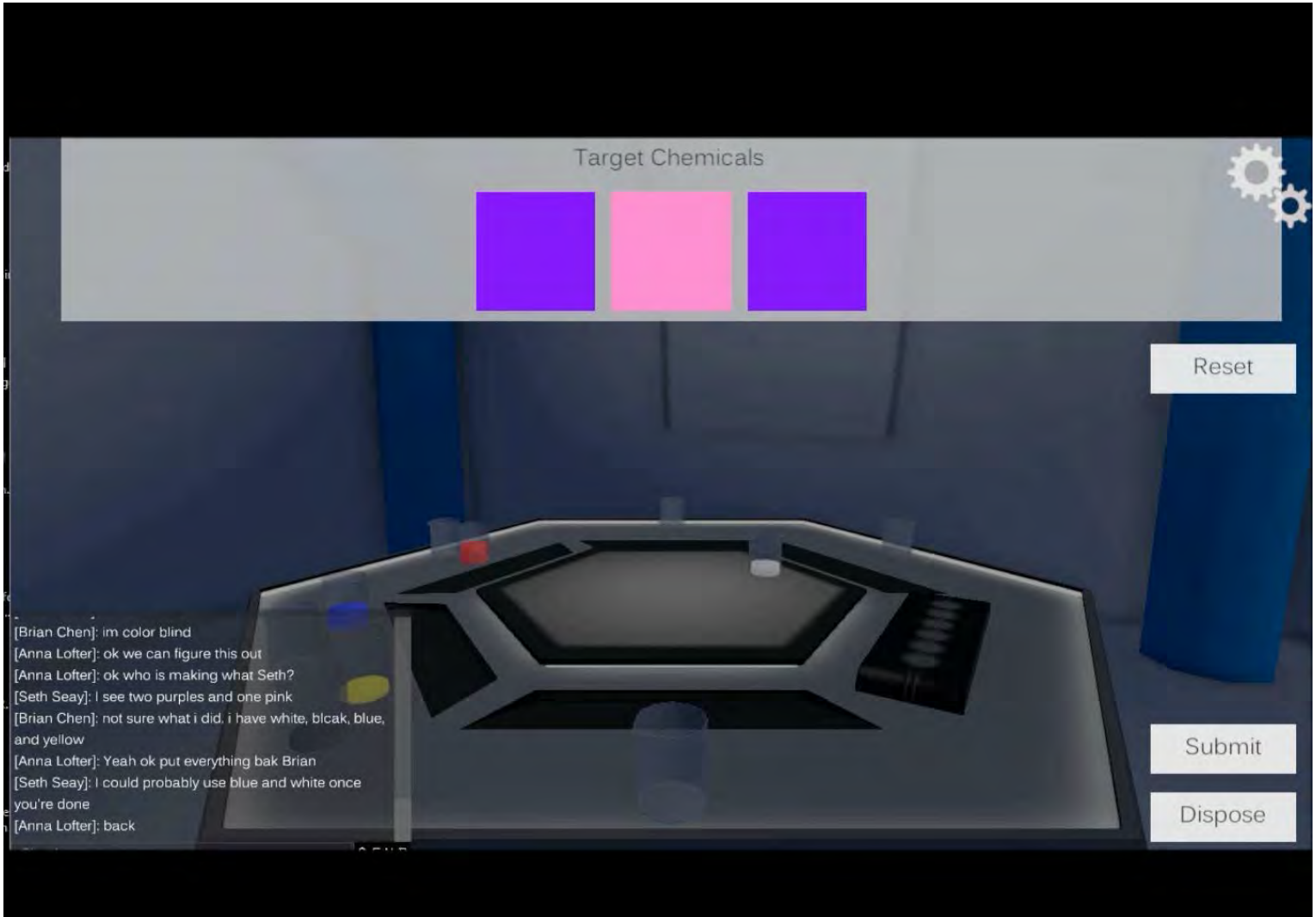
- Perform simultaneous synchronous actions
- High levels of communication and collaboration from the players

Challenge 2: Water Bunker

Challenge 3: Antidote

- Create a product from limited shared resources
- Communication and negotiation
- Allocation of assets

Challenge 3: Antidote

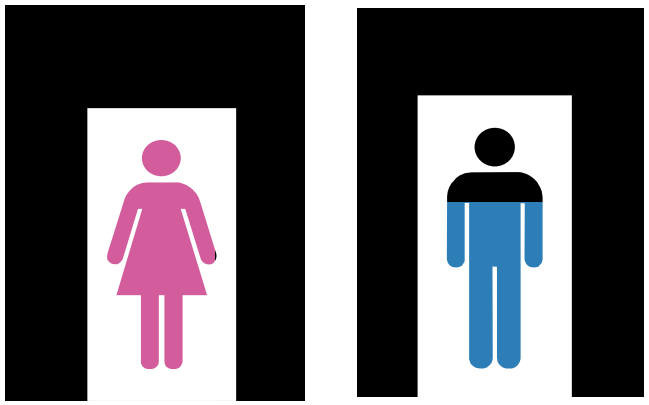


Research Methods

Pre Game Student Survey → Game Session → Post Game Student Survey

11 Teams

12 Schools across the United States

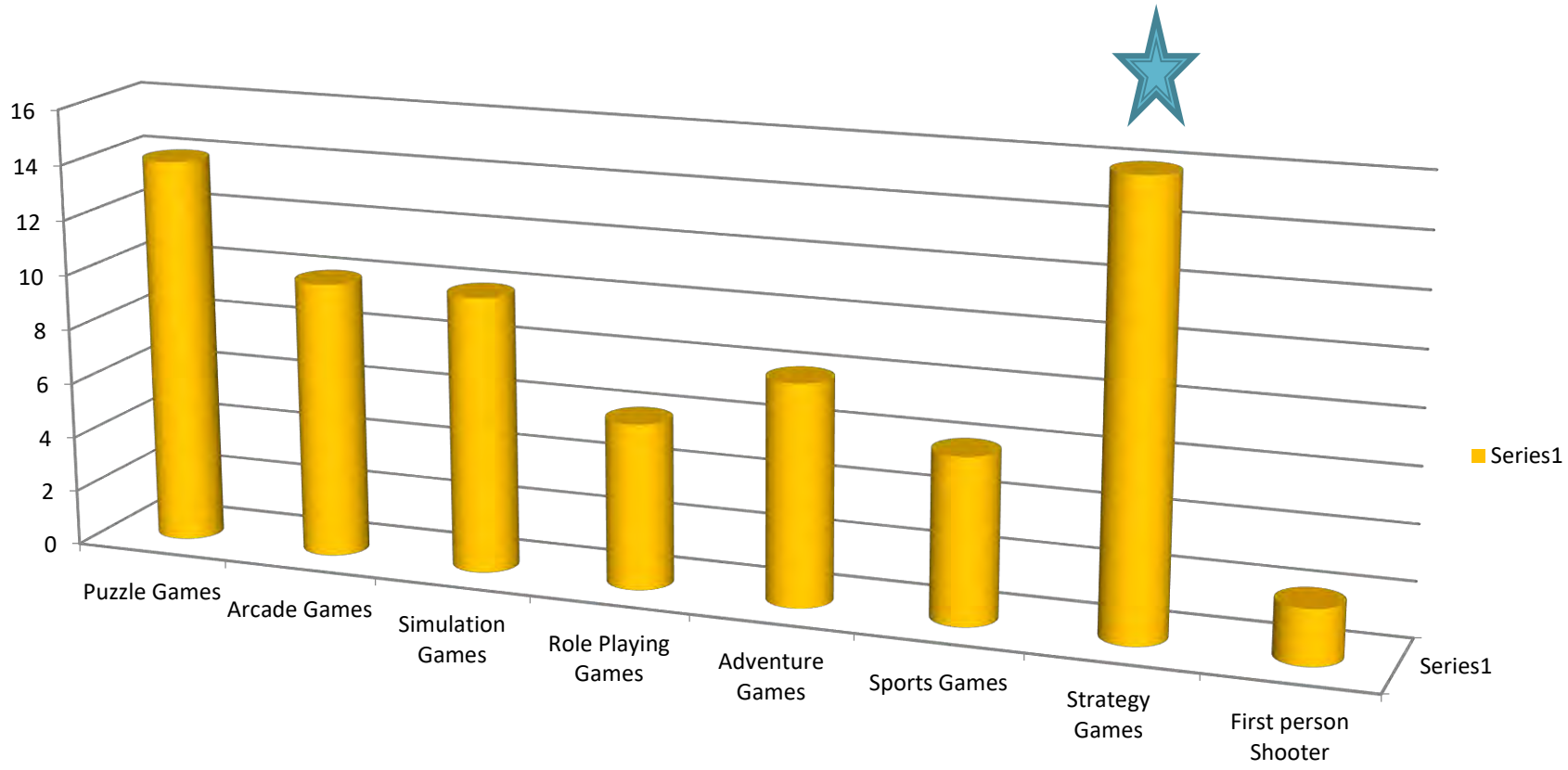


30 Participants (n = 30)

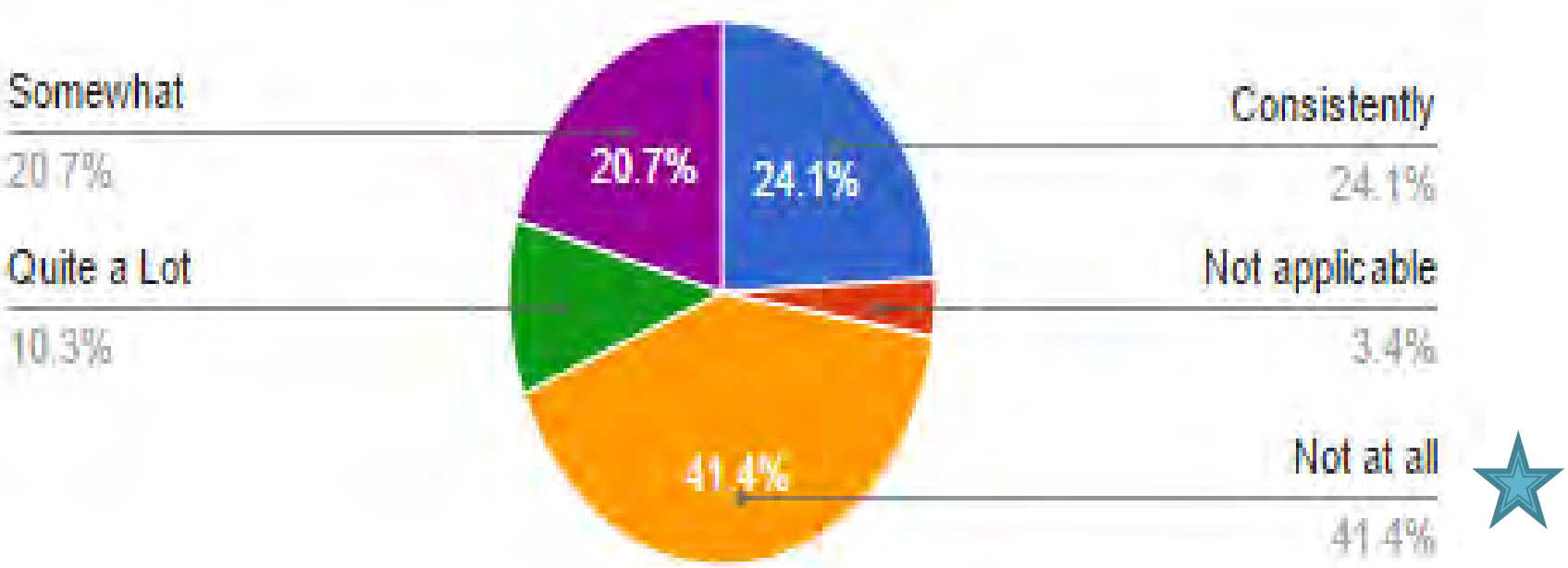
5 Professions

Pharmacy: 34.5%
Occupational Therapy: 20.7%
Osteopathic Medicine: 20.7%
Nursing: 13.8%
Physical Therapy: 10.3%

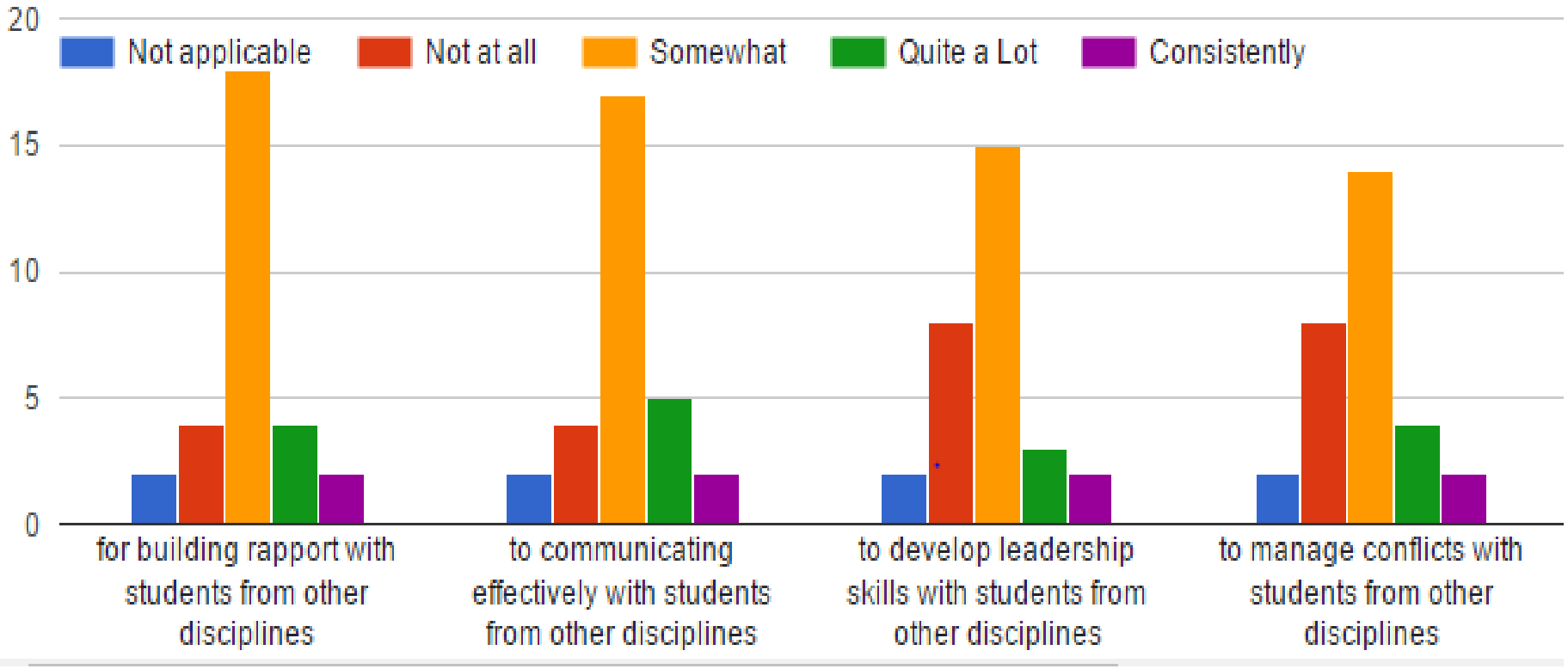
What type of games do students prefer?



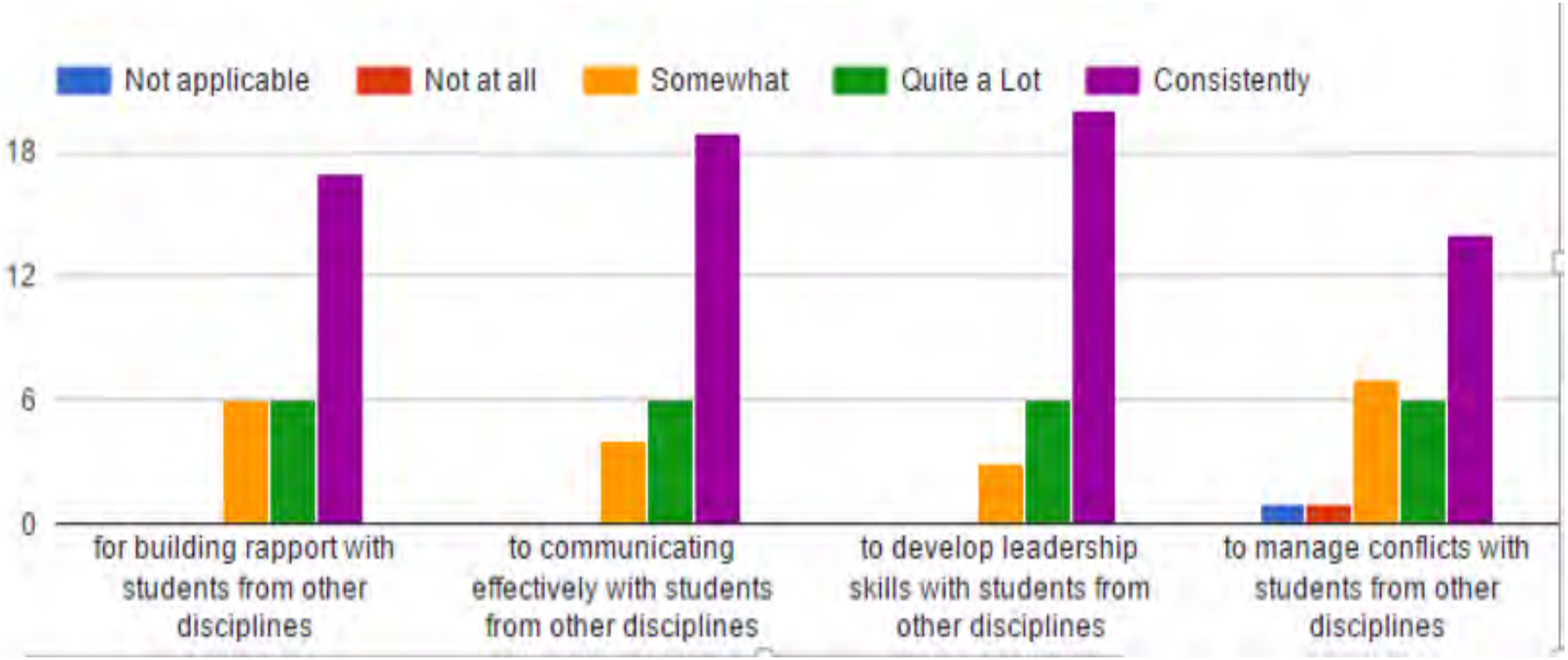
How often do you play video games?



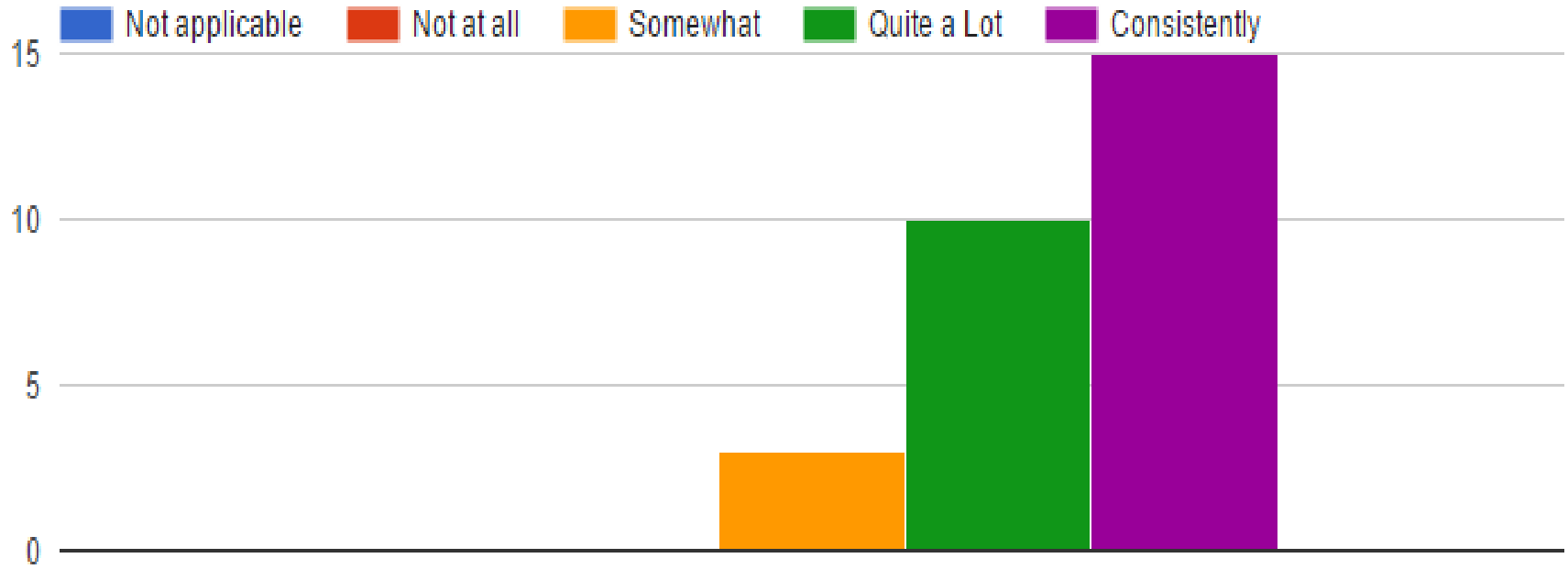
Pre Game: I have been given opportunity to:



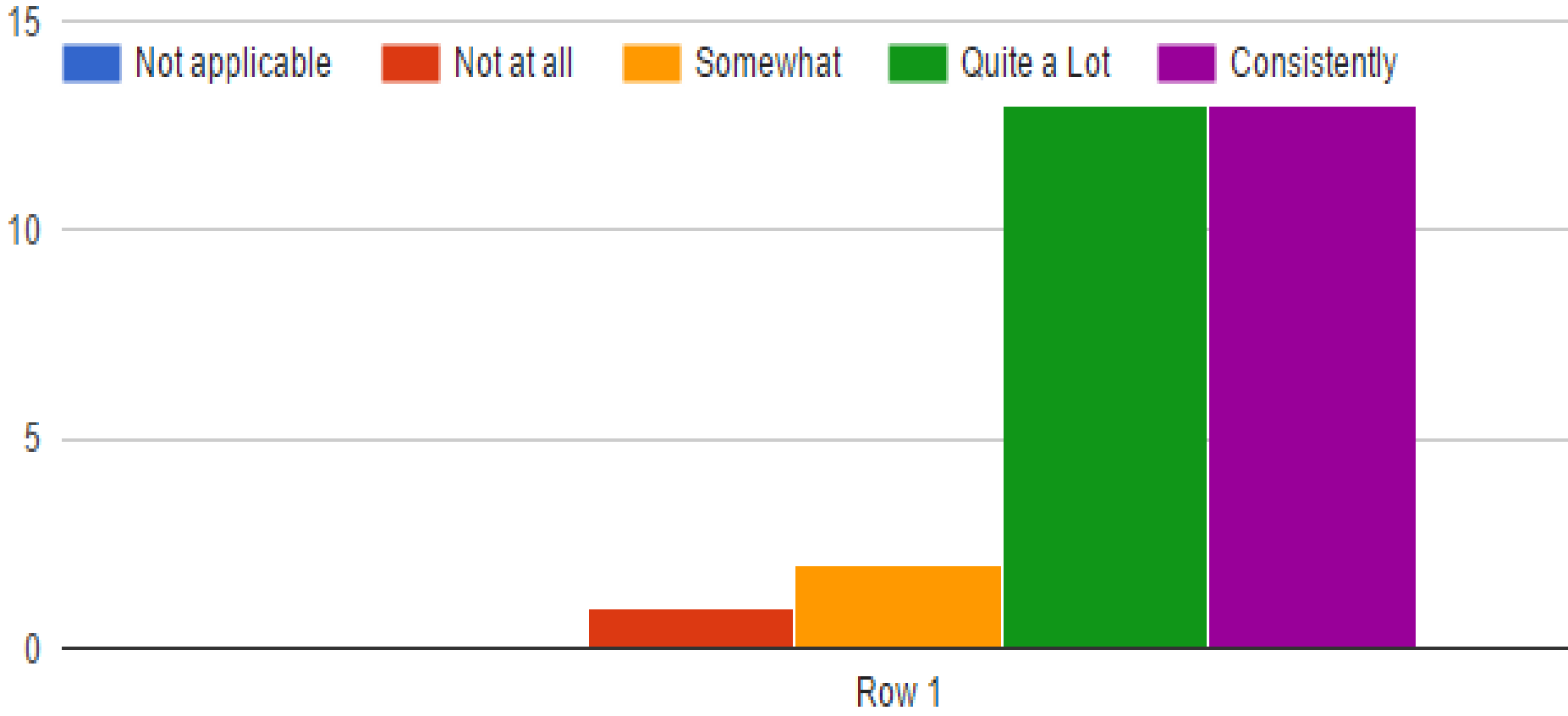
Post Game: During Game activities I have been given opportunity to:



After the game I would welcome the opportunity to work on small-group projects with members of my team



Would you like to incorporate these types of games into formal interprofessional activities in your curricula?



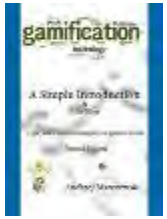
Lessons Learned

- The Game:
  - Mimycx and similar games
    - Good activity to promote and practice team building
    - Can serve as an initial activity for IPE
- General lessons
  - Brief Tutorials
  - Novice and user friendly
  - Path of least resistance – work with player behavior
  - Technology Issues
  - Test often
  - Protect time for failure
  - Funding

Resources

- **Books: Gamification**
  - For the win: How game thinking can revolutionize you business (2012)
    - Written by: Kevin Werbach

  - Gamification: A simple introduction (2013)
    - Written by: Andrzej Marczewski



  - The Gamification of learning and instruction
    - Written by: Karl M. Kapp

- **Internet Resources**
  - www.gamificationbook.com
  - http://www.epicwinblog.net/
  - http://yukaichou.com

Paper Chain Activity

Q&A