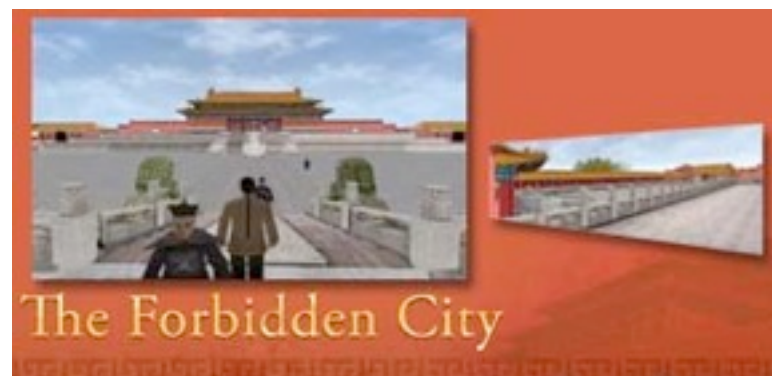


If You Build It, They (May) Come: Reflections on Educational Games

Ruben R. Puentedura, Ph.D.

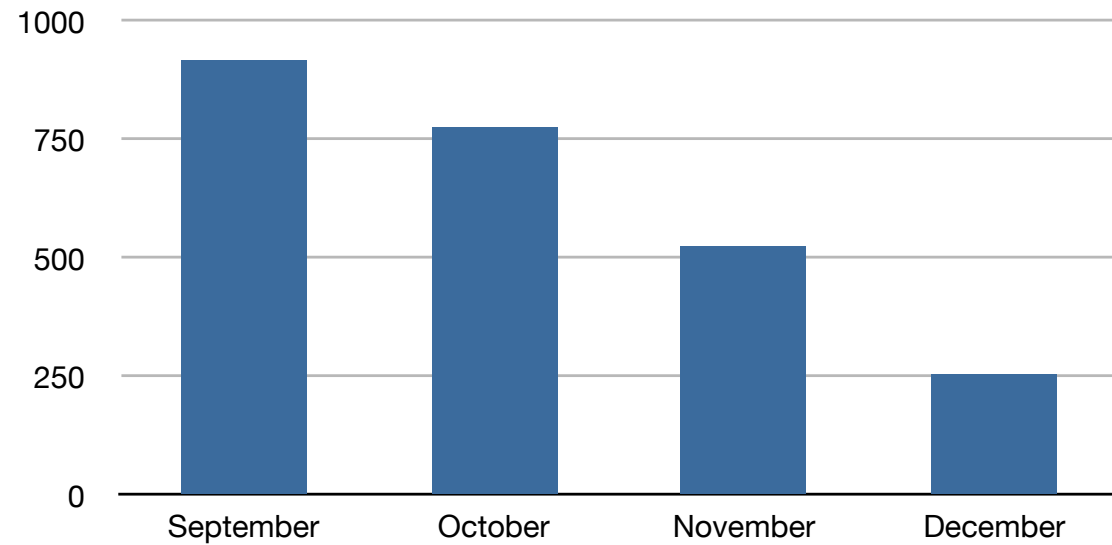
The Games and The Players

The Games



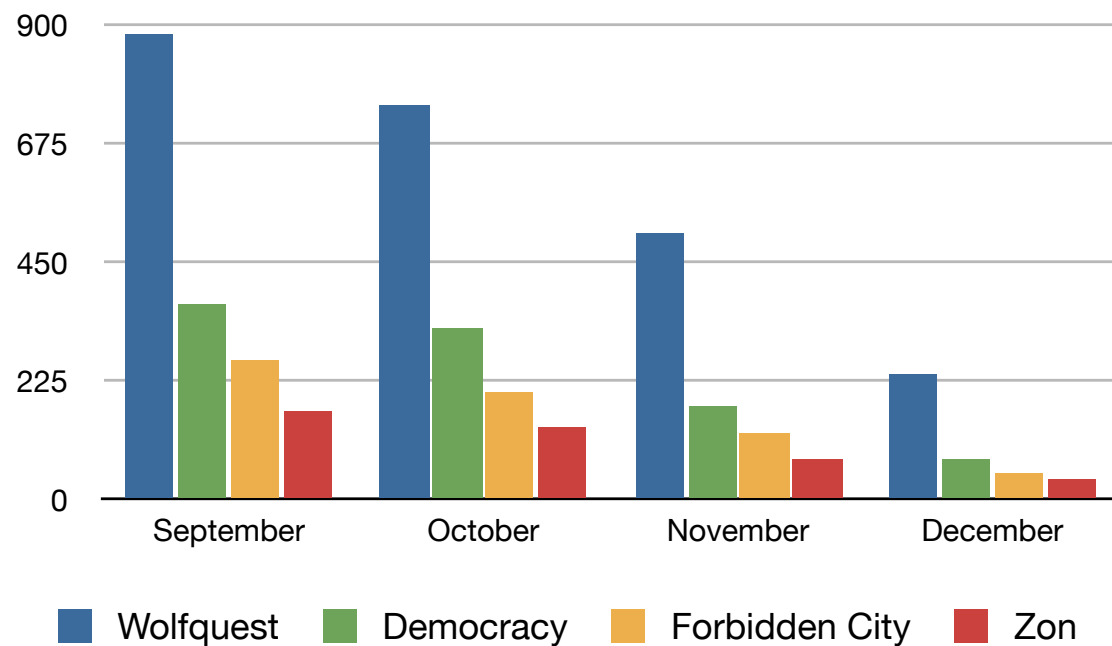
The Players

Total Players

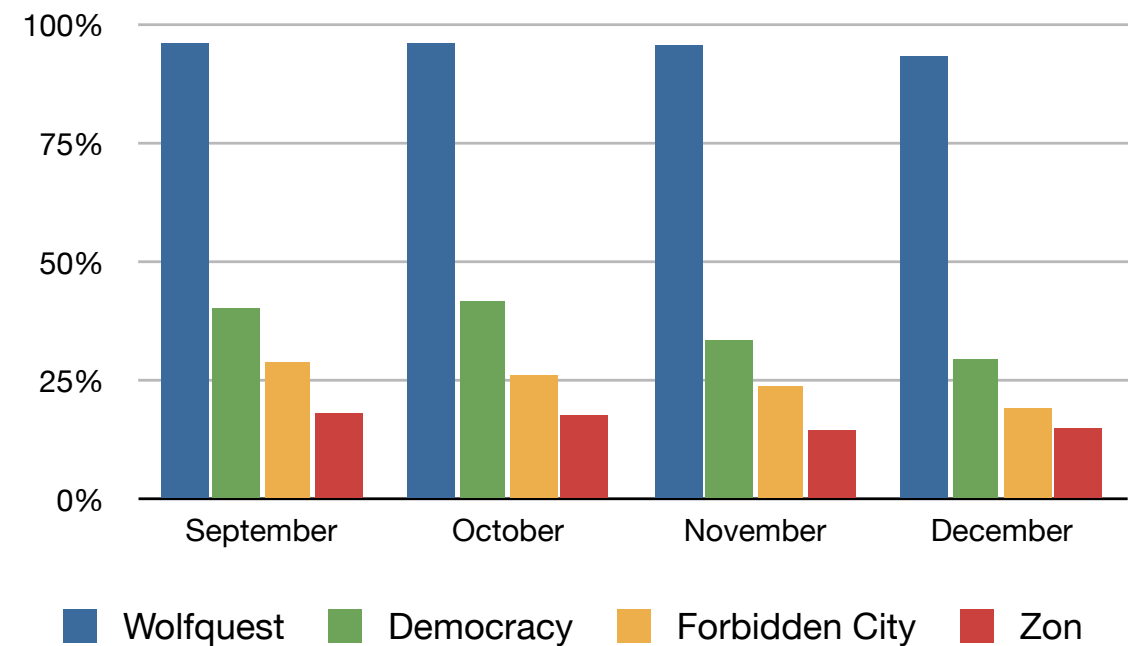


Total Project Number of Players: ~1400

Players by Game



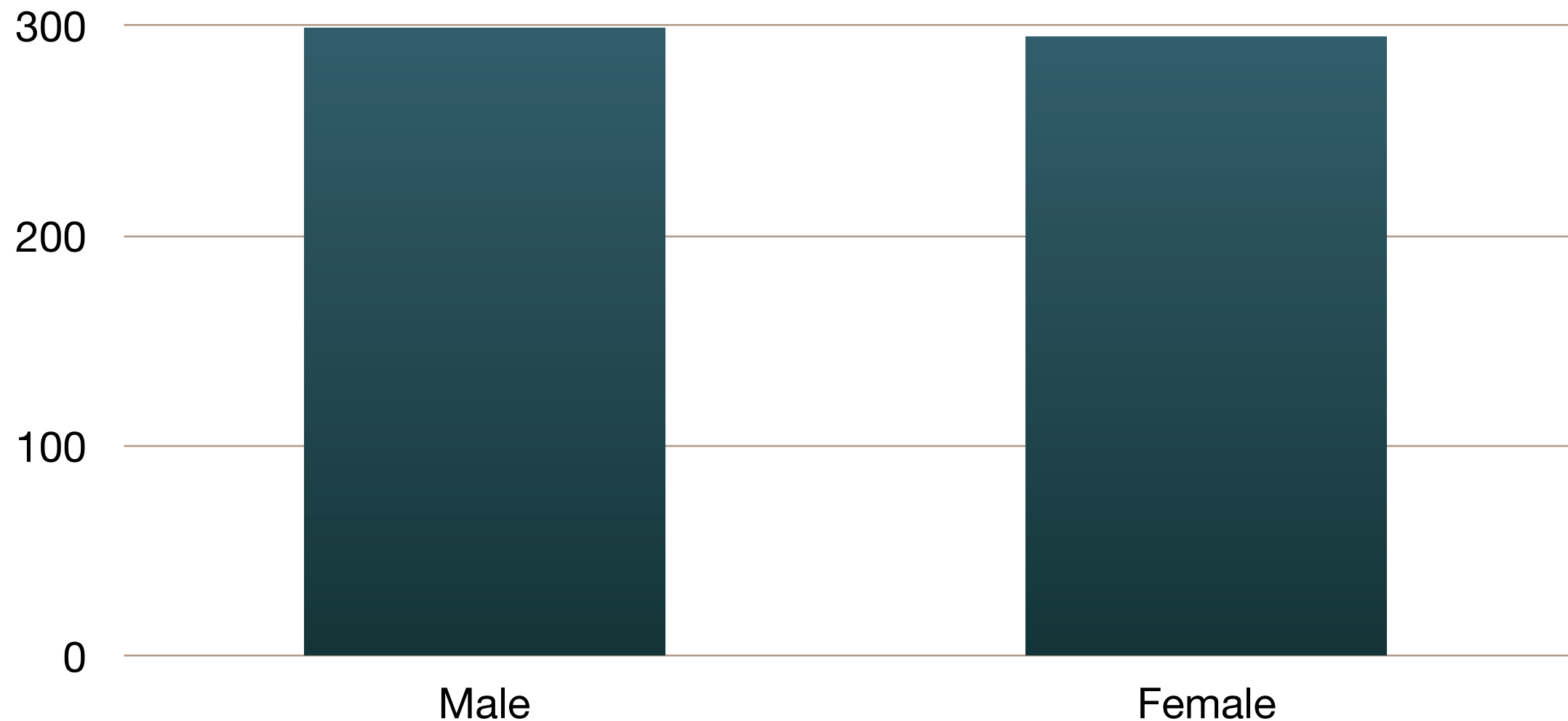
% Players by Game



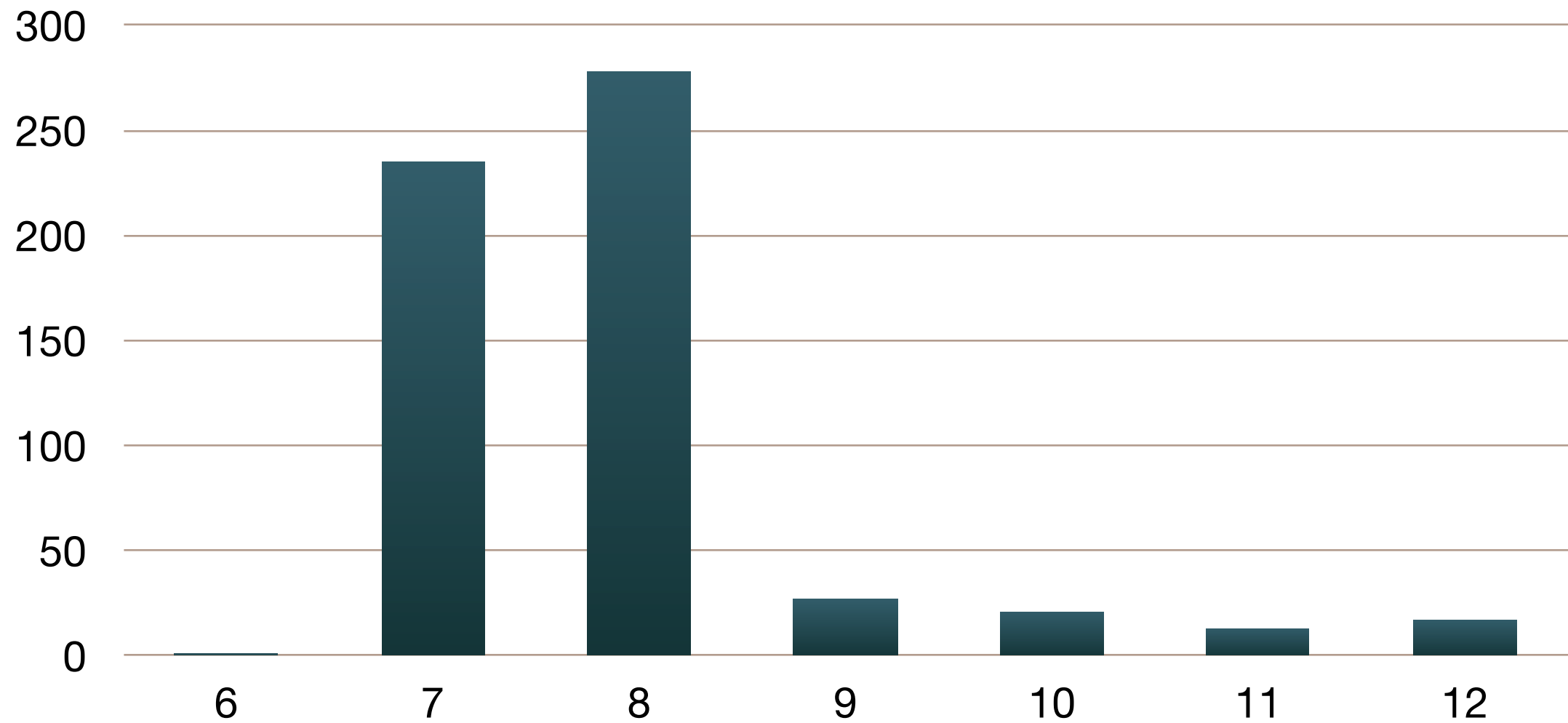
The Survey

Respondents by Gender

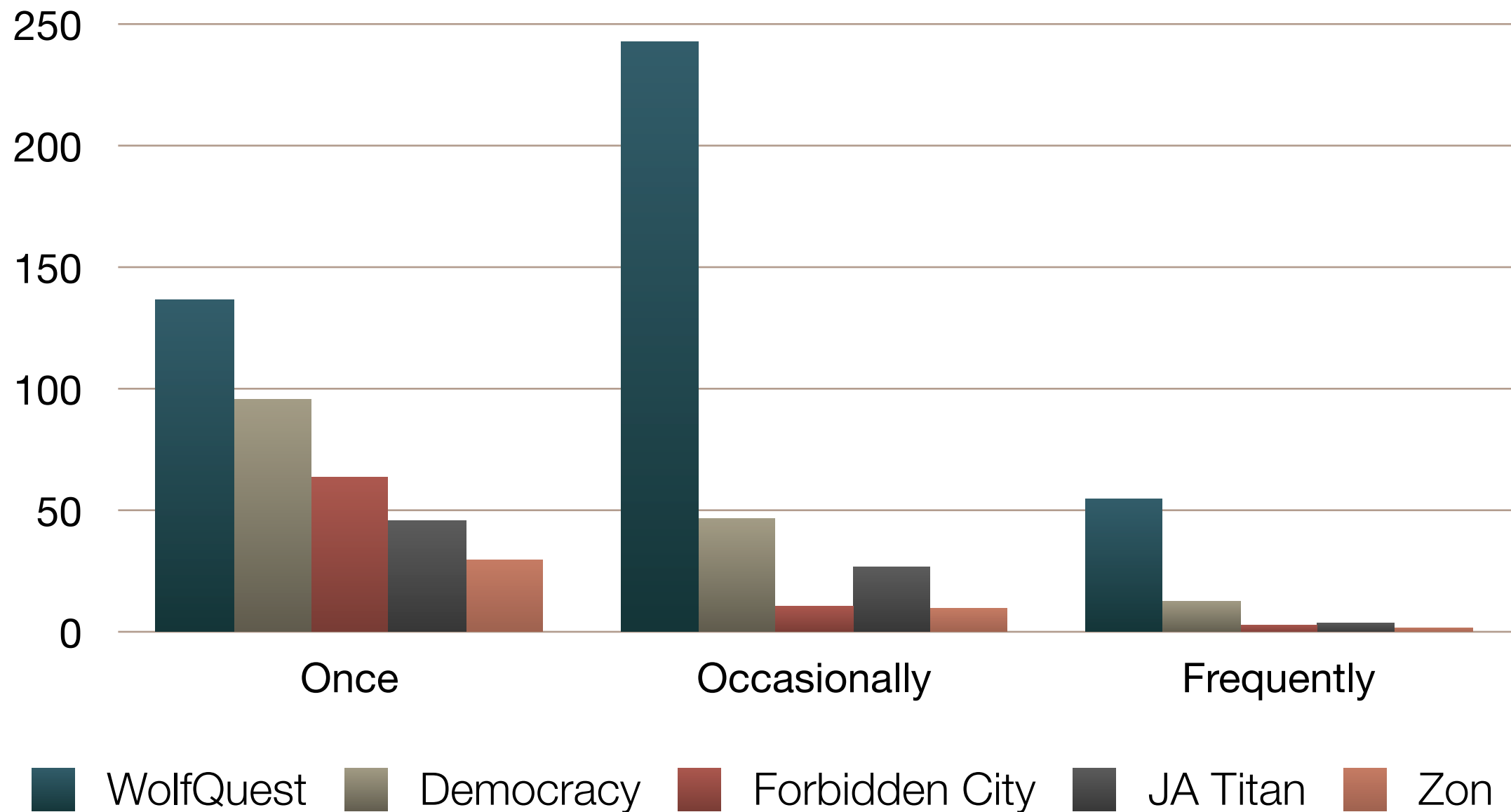
Total Number of Respondents: 609
Respondents Who Did Not Play Games: 147
(~33% of Players)



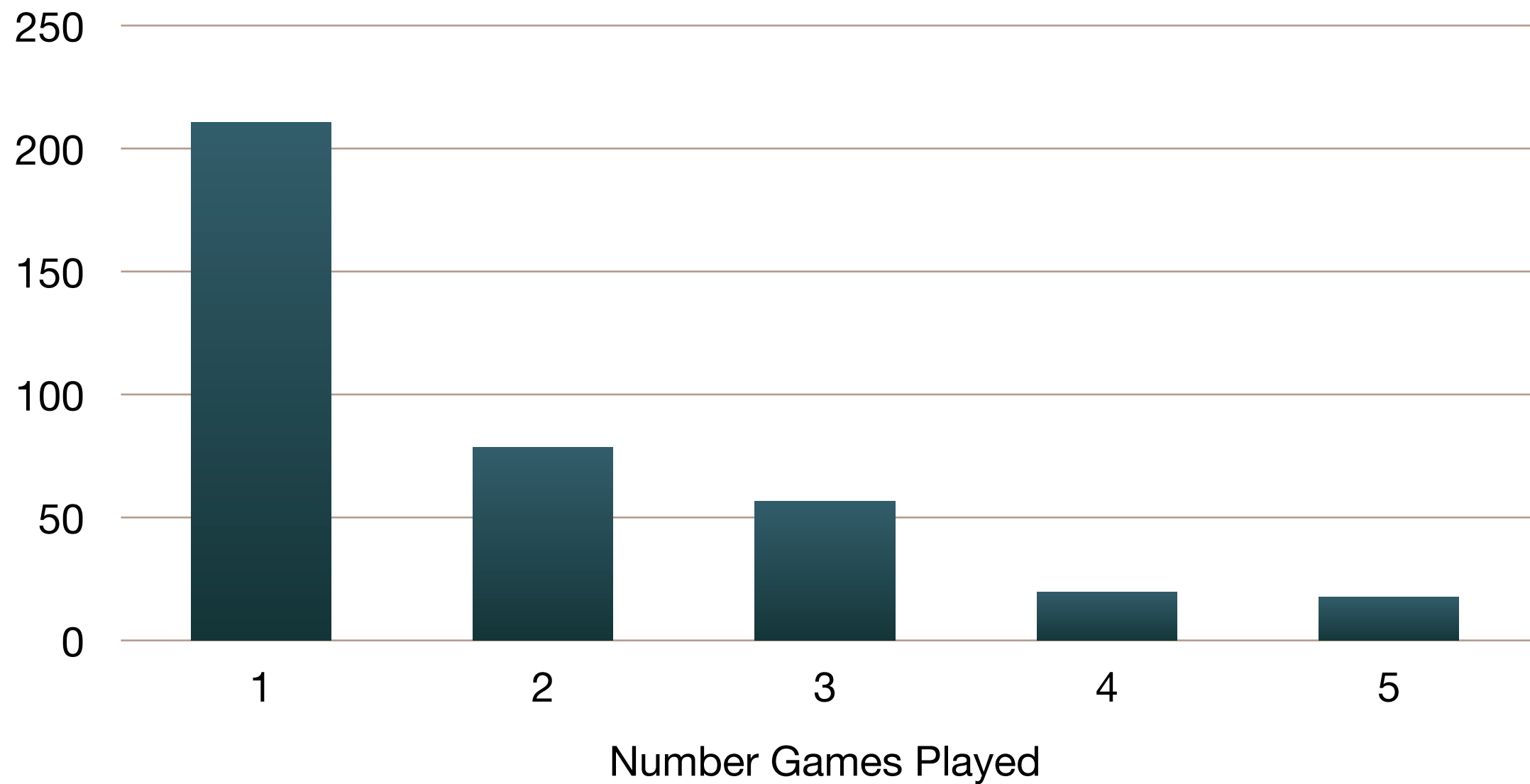
Respondents by Grade



How Often Did They Play?

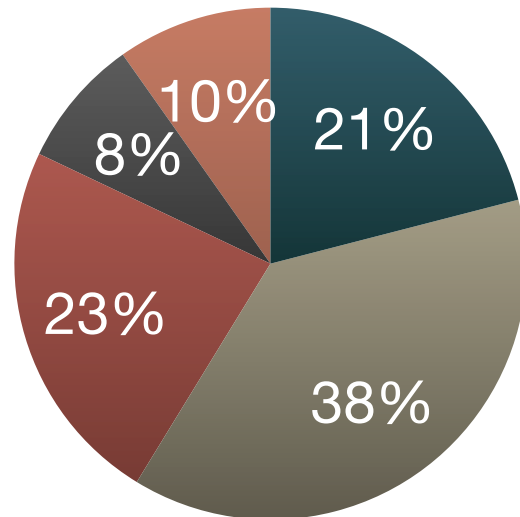


How Many Games Did They Play?

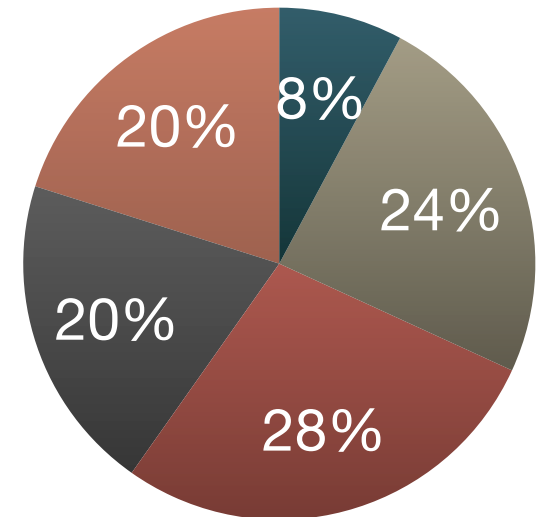


Did They Enjoy The Games?

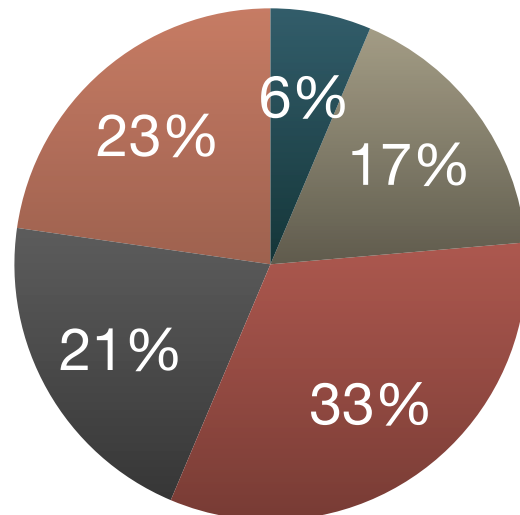
WolfQuest



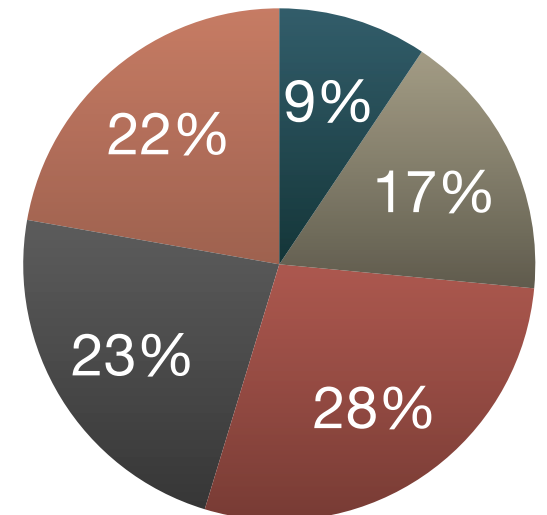
Democracy



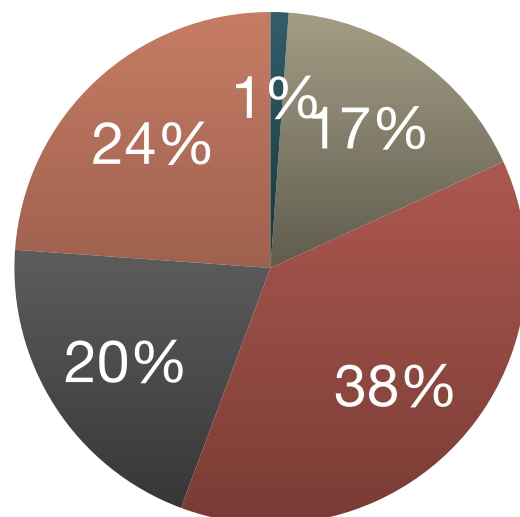
Forbidden City



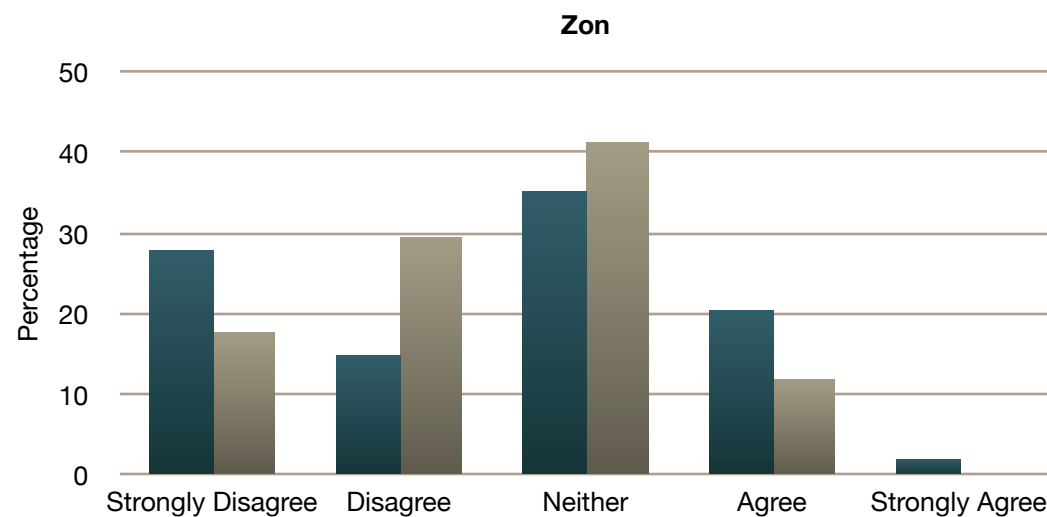
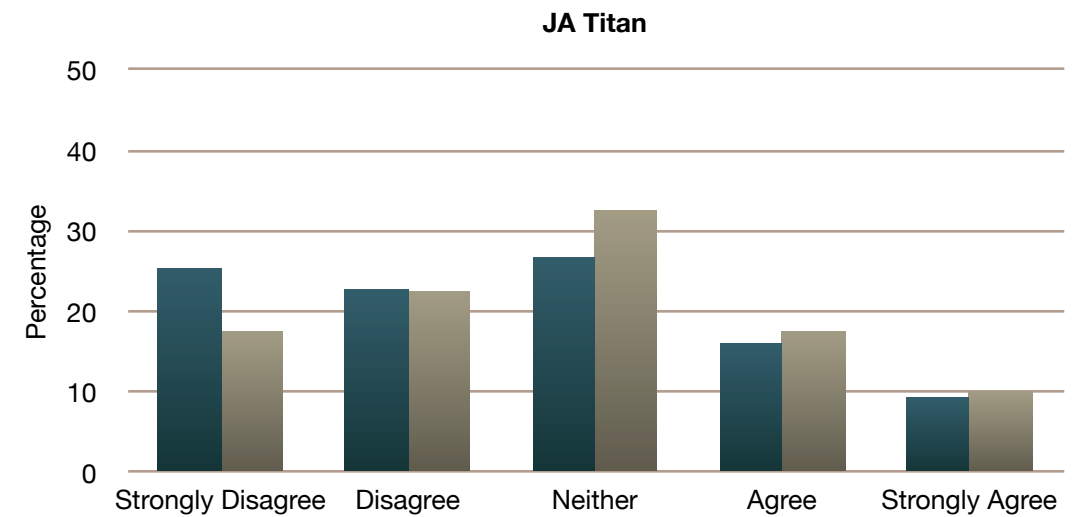
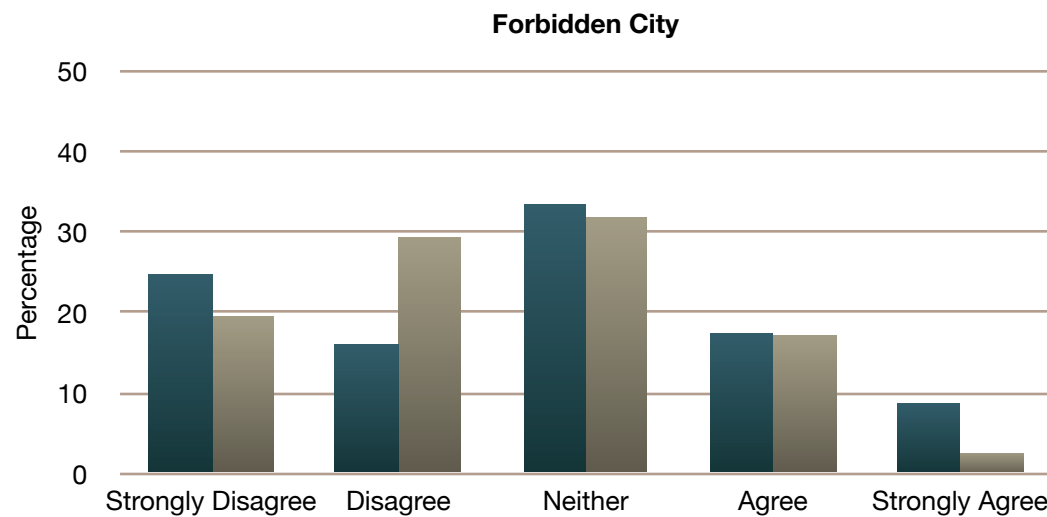
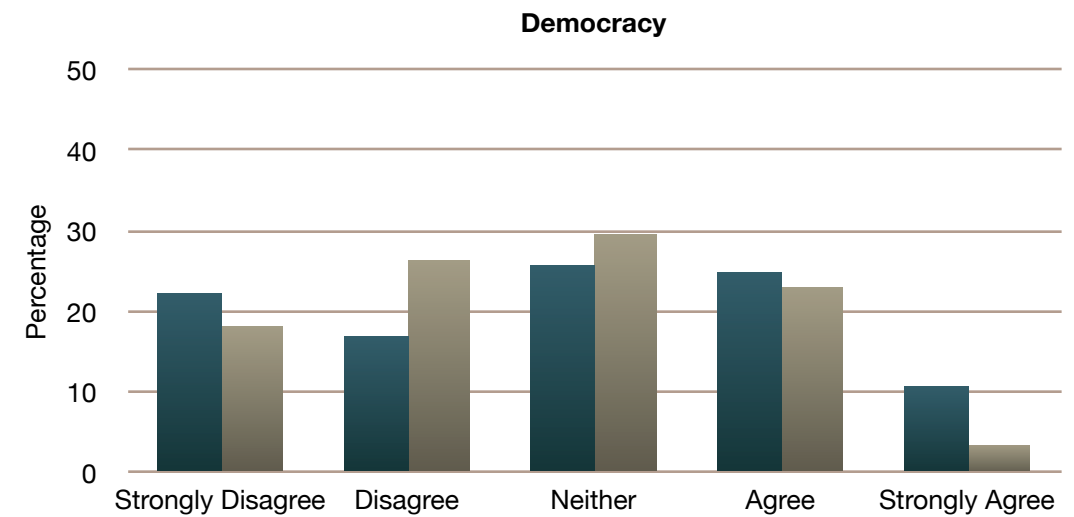
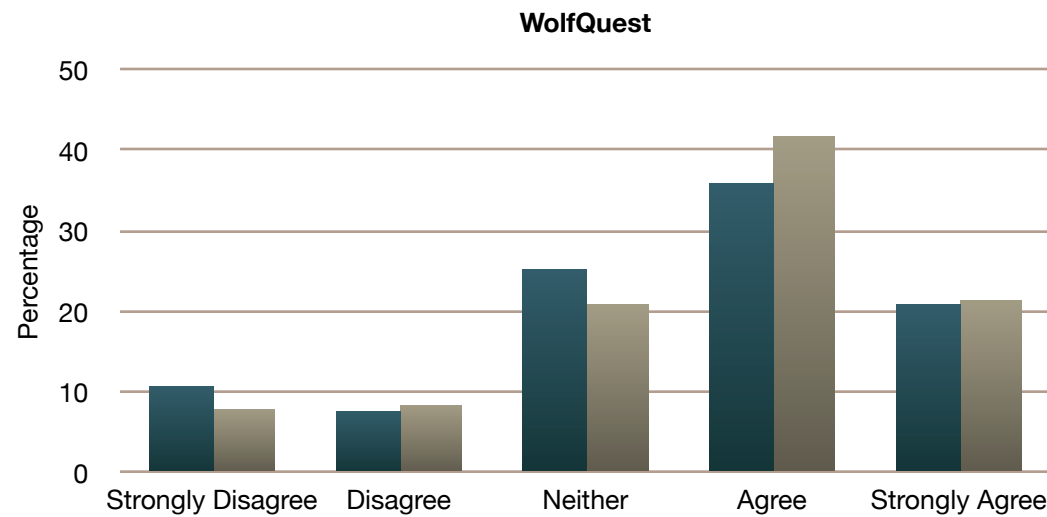
JA Titan



Zon



Enjoyment By Gender



 Male  Female

Hardcore and Casual Players

- **Hardcore Players:**

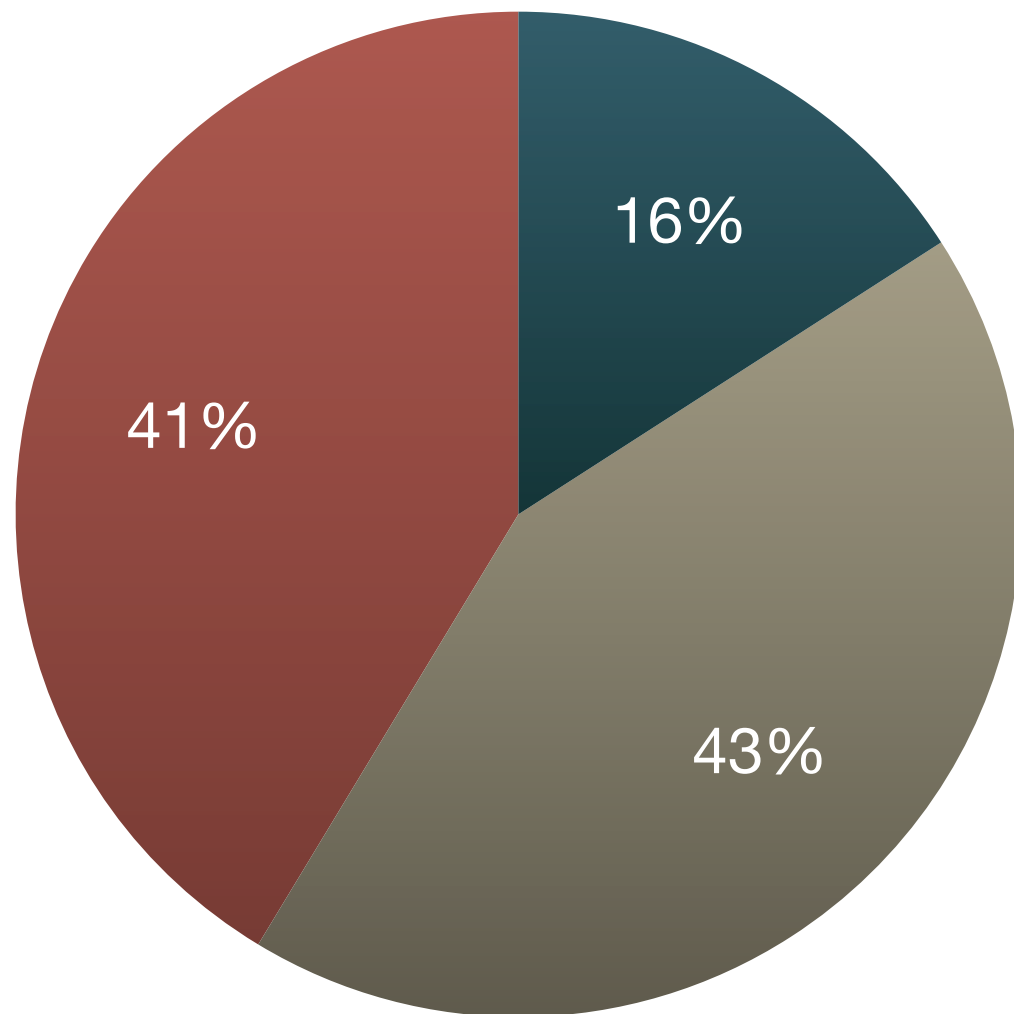
- Buy and play many games
- Enjoy longer play sessions
- Enjoy challenge, progression, and game mastery
- Tolerate complex controls because they have played many games and absorbed the skills involved
- See game playing as a lifestyle preference; talking about games is a social component of their lives

- **Casual Players:**

- Buy fewer games, buy popular games, or play Hardcore friend-recommended games
- Enjoy shorter play sessions
- Prefer having fun, or immersion in an atmospheric experience
- Generally require simpler controls (exception: C1 players)
- See games as another time-passing entertainment; might talk about games with Hardcore friends

What Type Of Gamer Are They?

Male

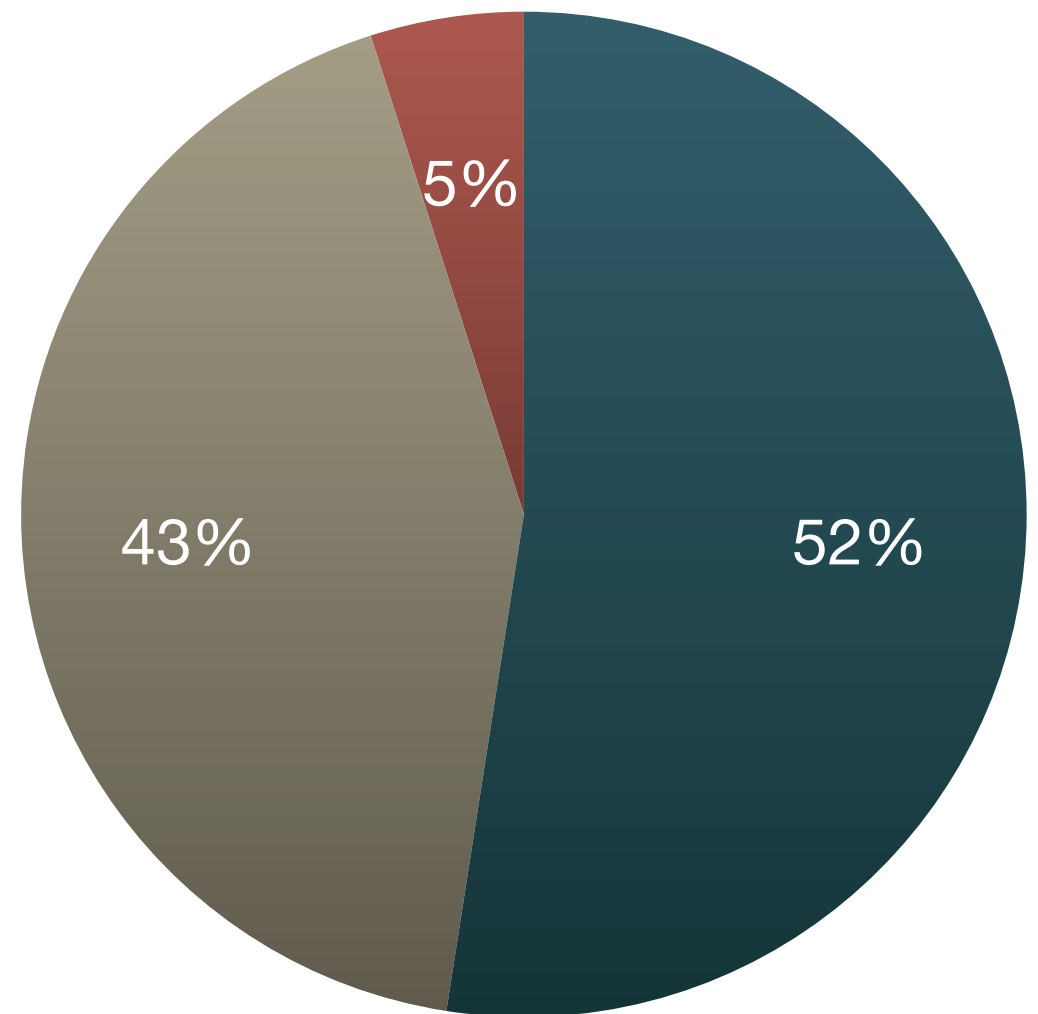


● No Idea

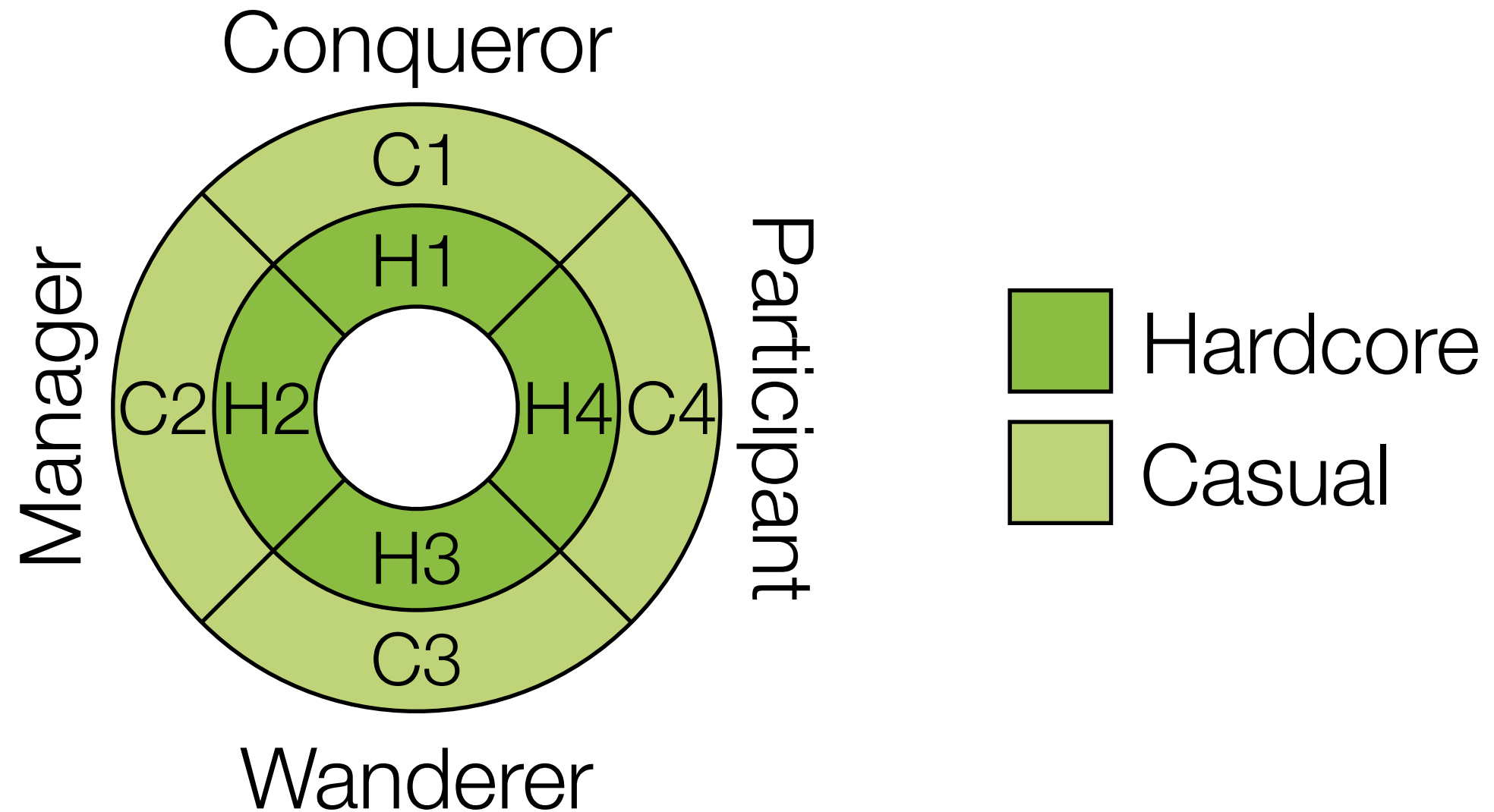
● Casual

● Hardcore

Female



The DGD1 Model (Bateman 2004)



The Four Play Styles

- **Conqueror:**

- Associated with challenge and the emotional payoff of triumph over adversity; tend to finish games they start.
- Highly patient with frustration: if they stick with it, they can win.
- Skills: proficiency with logistical optimization and strategic thinking.

- **Manager:**

- Associated with mastery and systems; may not finish many games that they start playing.
- Good at dealing with multiple factors in parallel.
- Skills: tactical competence backed with strategic thinking.

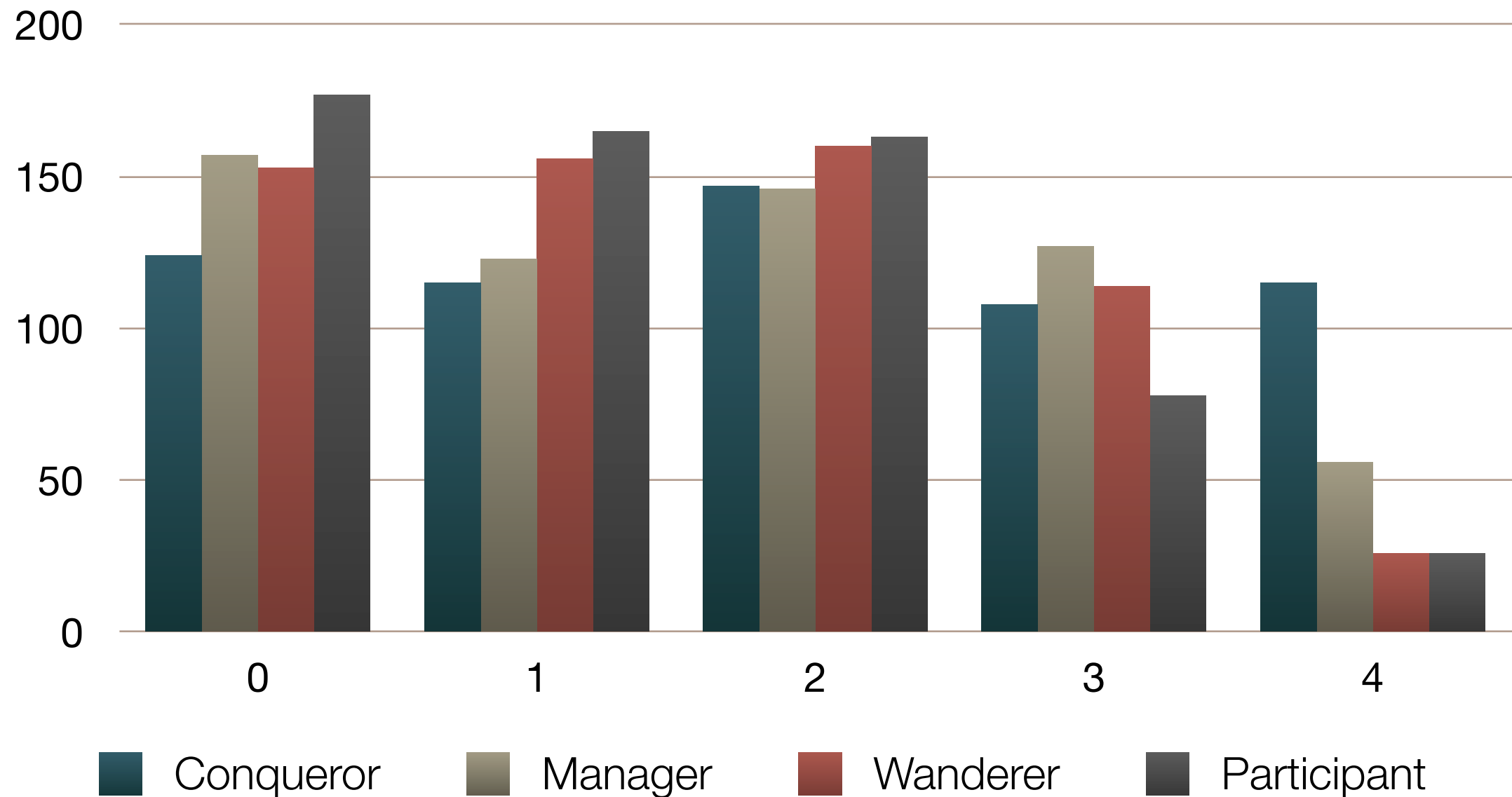
- **Wanderer:**

- Associated with experience and identity; challenge is not especially desired, but may be tolerated.
- Attracted by the feeling that something new is just around the corner, an involving story, or a beautiful world.
- Skills: tactical competence and abstract thinking.

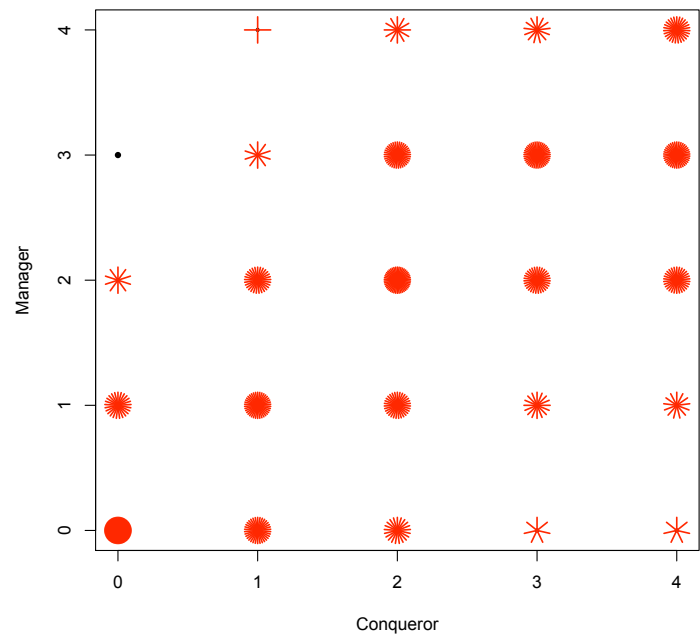
- **Participant:**

- Associated with emotions and involvement; seem happiest when playing with people, but also enjoy play which is rooted in emotion.
- Drawn to games with an emotional effect, that allow the player to affect virtual or real people.
- Skills: logistical optimization.

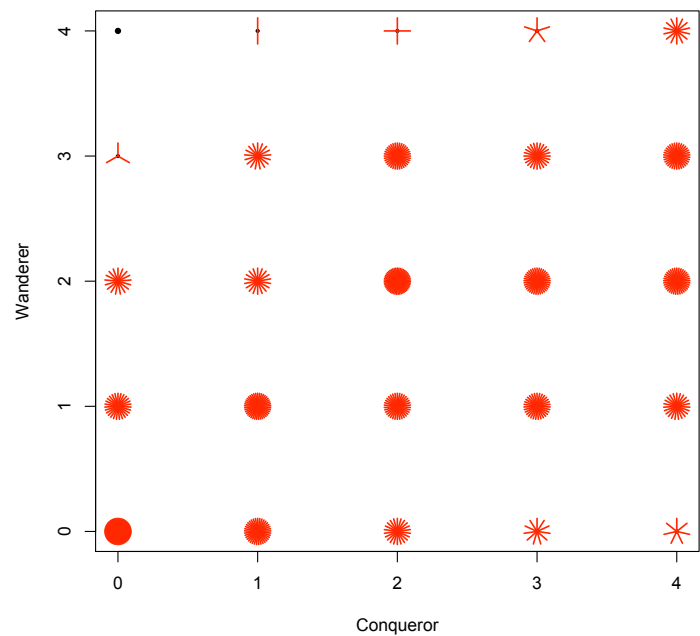
What Play Styles Do They Favor?



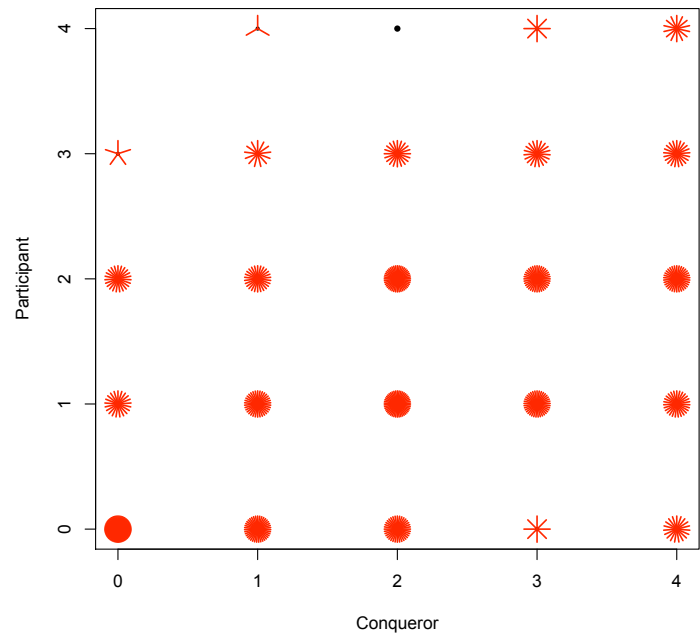
Manager



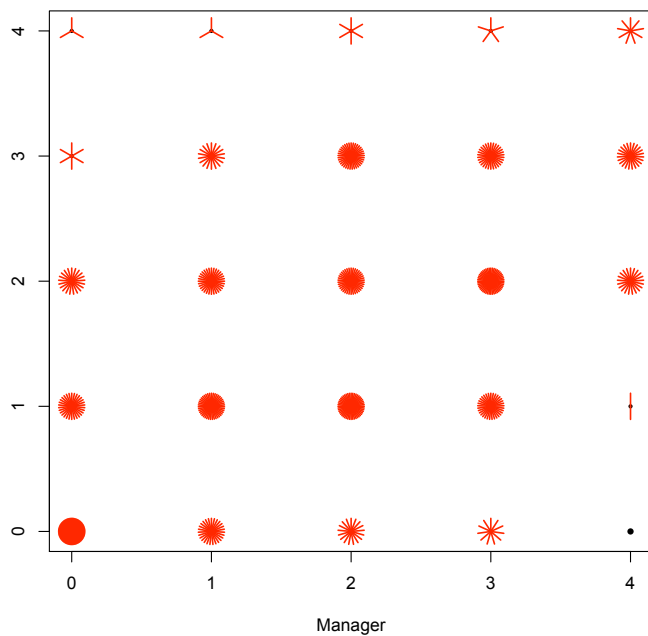
Wanderer



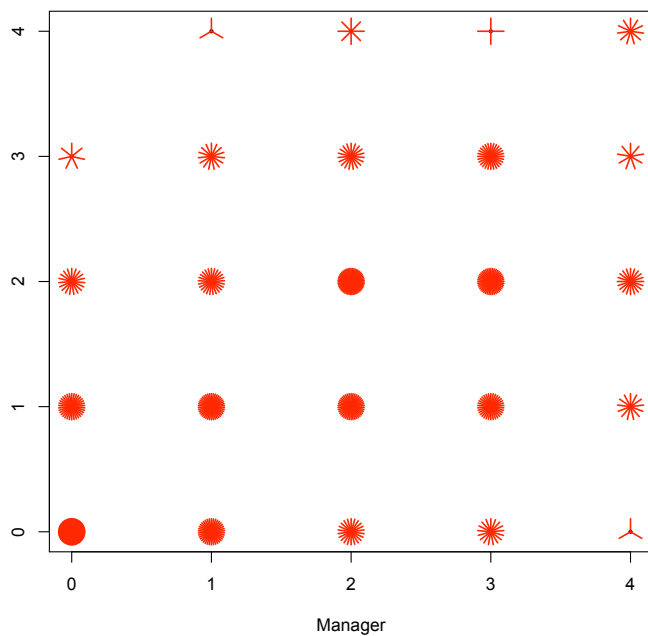
Participant



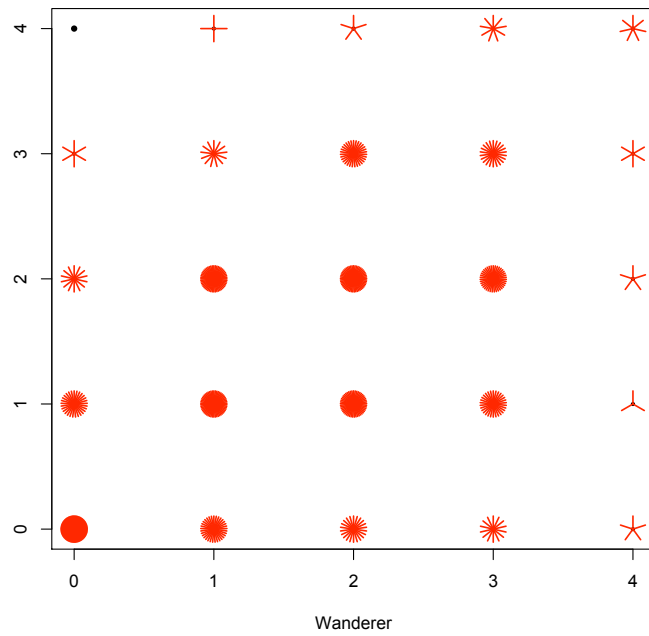
Wanderer



Participant



Participant

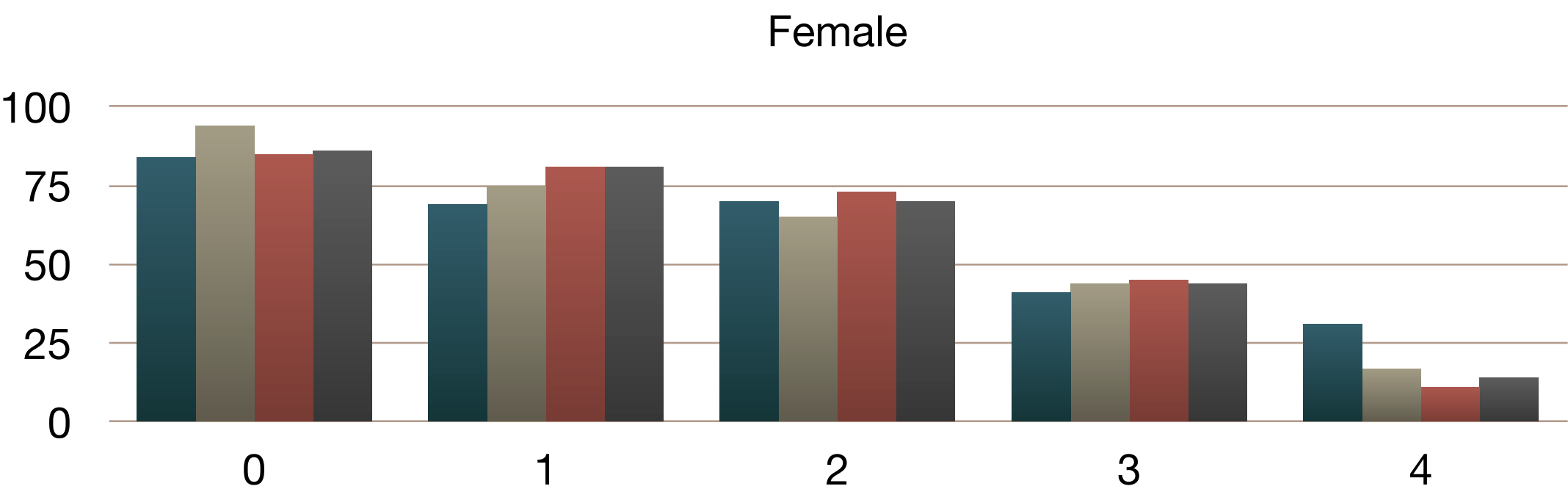
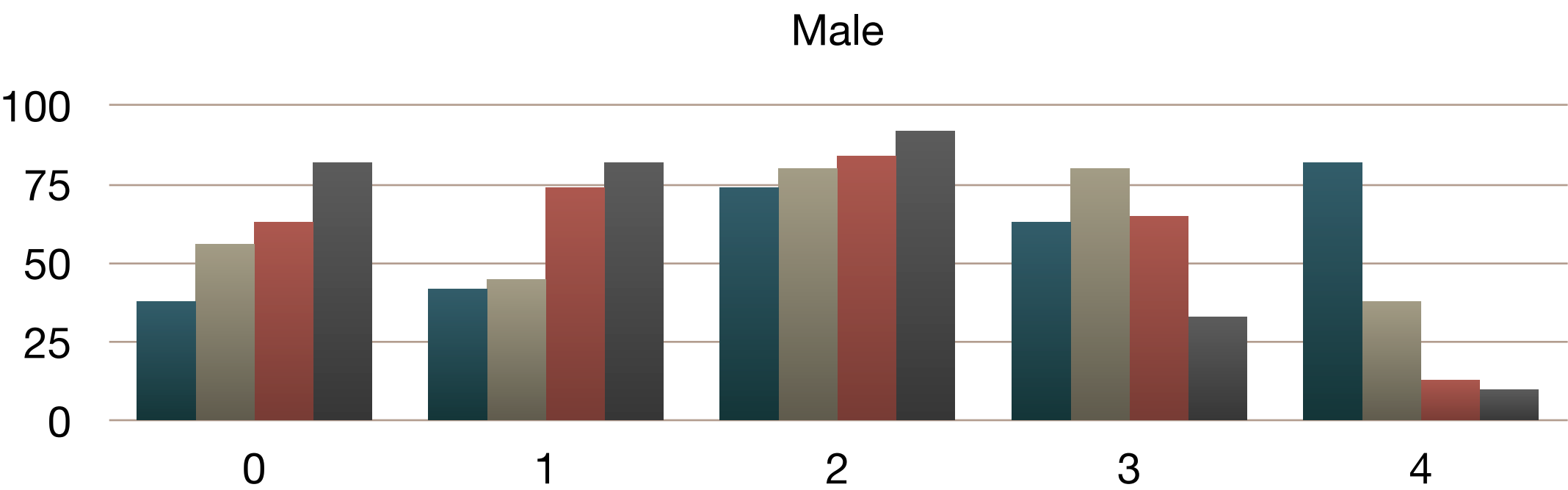


Conqueror

Manager

Wanderer

Player Type By Gender



Conqueror Manager Wanderer Participant

Next Steps

For 2010–2011

- All five games included on laptop.
- Self-contained podcast series:
Game And Learn: An Introduction to Educational Gaming
On iTunes U at:
<http://deimos3.apple.com/WebObjects/Core.woa/Browse/education-maine.gov.2246057621>
- Webinars for teachers planning to use games in classroom:
 - General games in education support;
 - Content-specific support for five games on image;
 - Content-specific support for new, vetted games:
 - *Lure of the Labyrinth* – <http://labyrinth.thinkport.org/www/>
 - *Sleep Is Death* – <http://www.sleepisdeath.net/>

Game And Learn: An Introduction to Educational Gaming

The Core Definitions

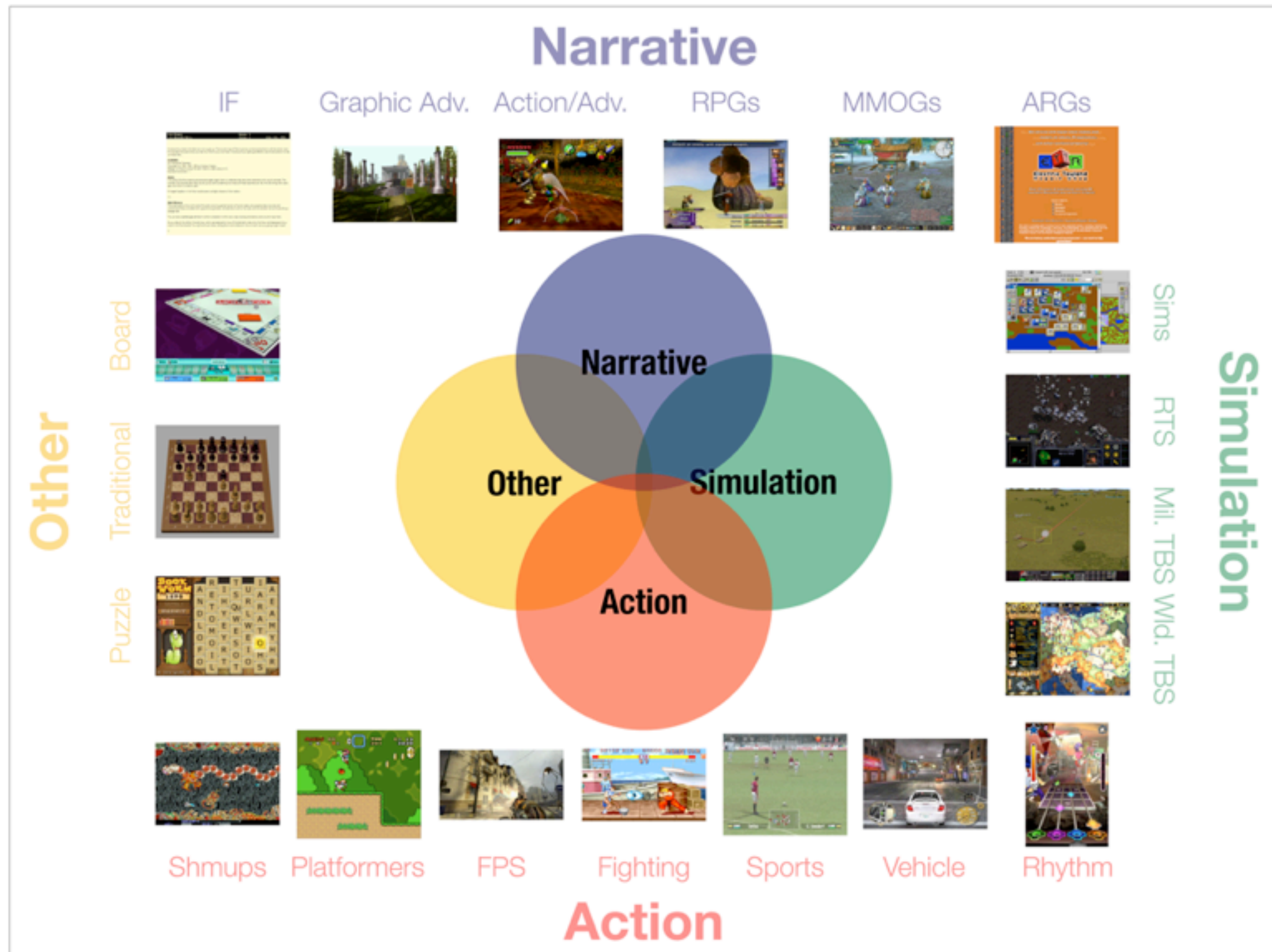
Games and Narrative



Games and Boredom

When Players Say...	...They Mean
The game is too easy	Game patterns are too simple
The game is too involved	Players are uninterested in the information required to detect patterns
The game is too hard	Patterns are perceived as noise
The game becomes too repetitive	New patterns are added too slowly
The game becomes too hard	New patterns are added too fast
The game runs out of options	All game patterns are exhausted

The Taxonomy



Learning and Education

Symbolic Systems

- 2. Appreciating good design and its principles
- 3. Seeing interrelations within and across symbolic systems
- 4. Mastering game symbolic systems
- 5. Relating the game world to other worlds



Redefinition

Tech allows for the creation of new tasks, previously inconceivable

Modification

Tech allows for significant task redesign

Augmentation

Tech acts as a direct tool substitute, with functional improvement

Substitution

Tech acts as a direct tool substitute, with no functional change

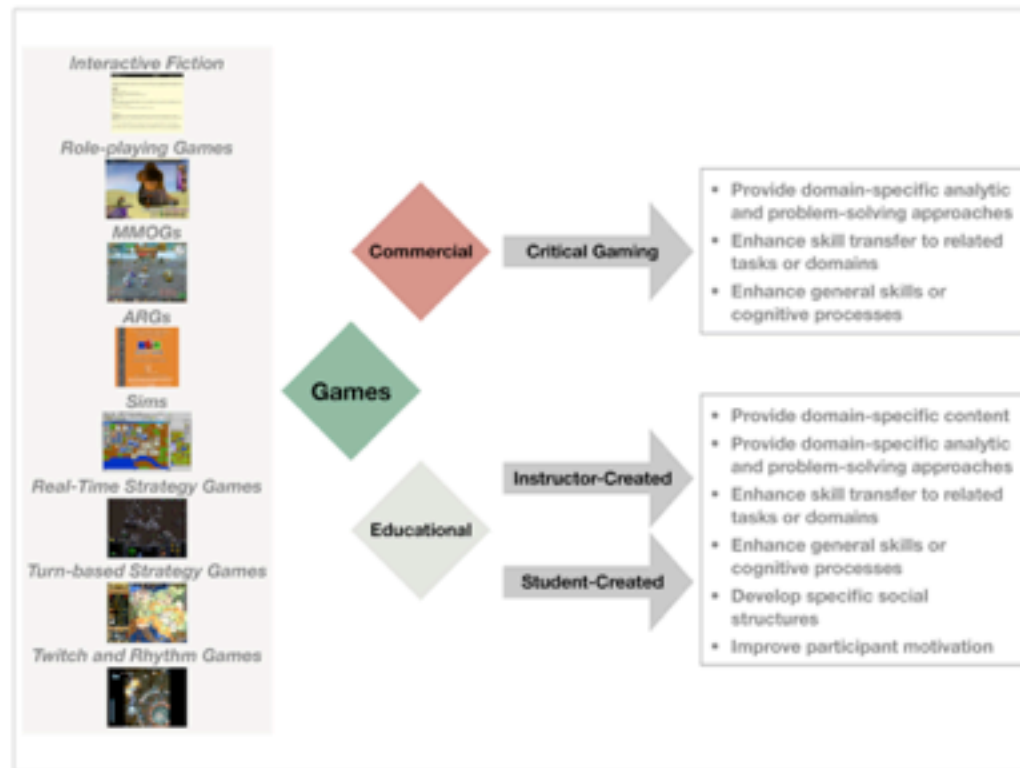
Transformation



Enhancement



Using Games



The Serious Games Networking Portal



Games and Narrative

Character Functions

Introduction		
#	Function	Example
1	Absentation	A member of the family absents him/herself.
2	Interdiction	An interdiction is given to the hero.
3	Violation	The interdiction is violated.
4	Reconnaissance	A villain makes an attempt to get information.
5	Delivery	The villain gets information about the victim.
6	Trickery	The villain tries to deceive the victim.
7	Complicity	The victim is deceived.

The Donor Sequence		
#	Function	Example
12	1st Donor Function	The hero is tested by a donor of a magical agent.
13	Hero's Reaction	The hero reacts to the agent or donor.
14	Receipt of Agent	The hero acquires the use of the magical agent.
15	Guidance	The hero is led to the object of search.
16	Struggle	The hero and villain join in combat.
17	Branding	The hero is branded.
18	Victory	The hero defeats the villain.
19	Liquidation	The initial misfortune or lack is liquidated.

The Body of the Story		
#	Function	Example
8	Villainy	The villain causes harm to a family member. - OR
8a	Lack	A family member lacks or desires something.
9	Mediation	A misfortune is made known, the hero is dispatched.
10	Begin Counteraction	The hero (seeker) agrees to counteraction.
11	Departure	The hero leaves home.

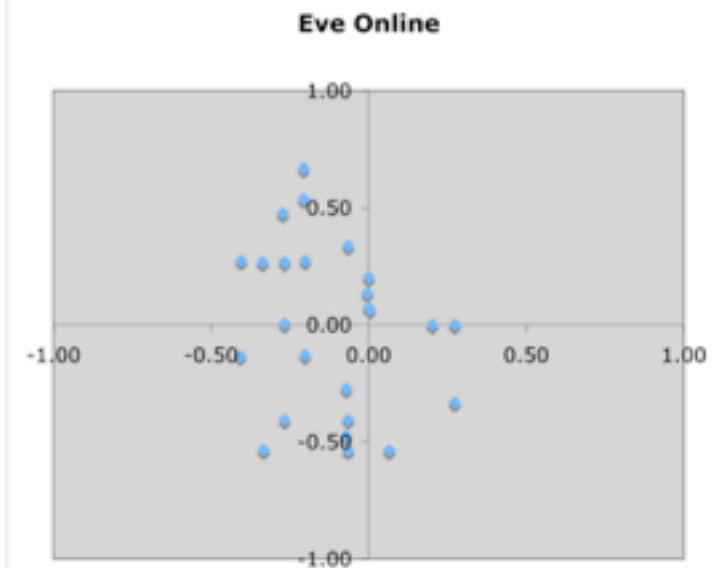
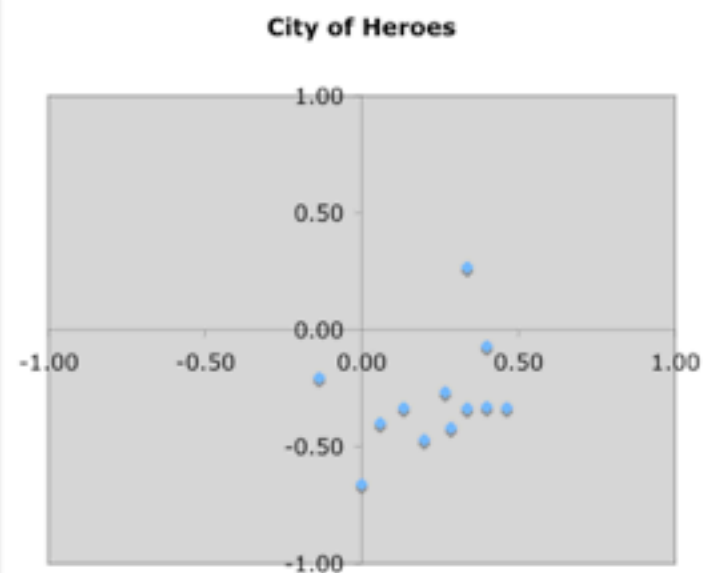
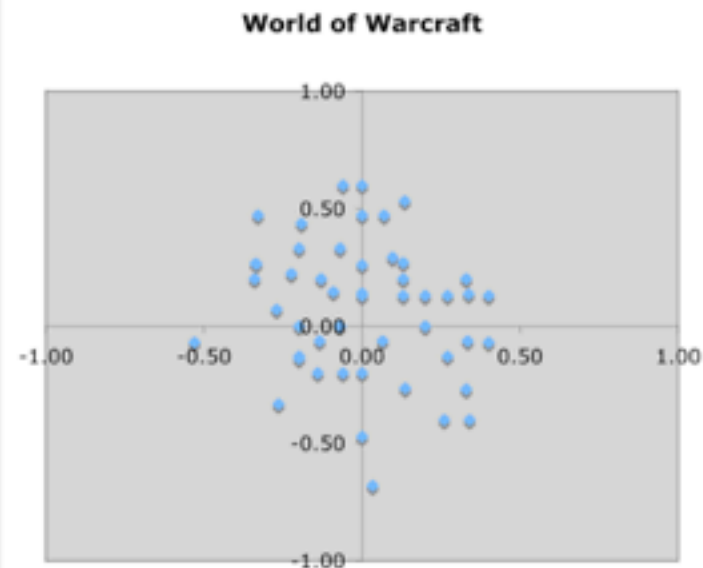
The Hero's Return		
#	Function	Example
20	Return	The hero returns.
21	Pursuit	The hero is pursued.
22	Rescue	The hero is rescued from pursuit.
23	Unrecognized Arrival	The hero, unrecognized, arrives home or elsewhere.
24	Unfounded Claims	A false hero presents unfounded claims.
25	Difficult Task	A difficult task is proposed to the hero.
26	Solution	The task is resolved.
27	Recognition	The hero is recognized.
28	Exposure	The false hero or villain is exposed.
29	Transfiguration	The hero is given a new appearance.
30	Punishment	The villain is punished.
31	Wedding	The hero is married and ascends the throne.

Notes:

- 12–14 can also occur as a block prior to the 8–11 block;
- 23–24 and 25–26 can also occur prior to 19;
- 17 can occur between 25 and 26.

The Players

Bartle's Types and the Games (Puentedura)



Assessment and Design

Experimental Design

Groups	Teacher Expectation	
	Benefit	No Benefit
1. No-Treatment Control	A	B
2. Hawthorne Control	C	D
3. Experimental Procedure	E	F

Essential
Important
Desirable

Electromagnetism Supercharged! Learning Physics with Digital Simulation Games

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²Department of Curriculum and Instruction, Lynch School of Education, Boston College

Abstract: Learning scientists are increasingly turning to computer and video games as tools for learning. Simulation might not only motivate learners, but provide accessible ways for students to develop intuitive understandings of abstract physics phenomena. This study examines what learning occurs when an electromagnetism simulation game is used in a school for underserved students. Students in the experimental (guided discovery-based science) on students to confront weaknesses in understanding. Game mechanics enabled physics representations became tools for understanding problems. Implications for educational digital media are discussed. Yet, it was also these very same game mechanics and significant challenges in terms of student engagement, motivation, and learning of physics concepts.

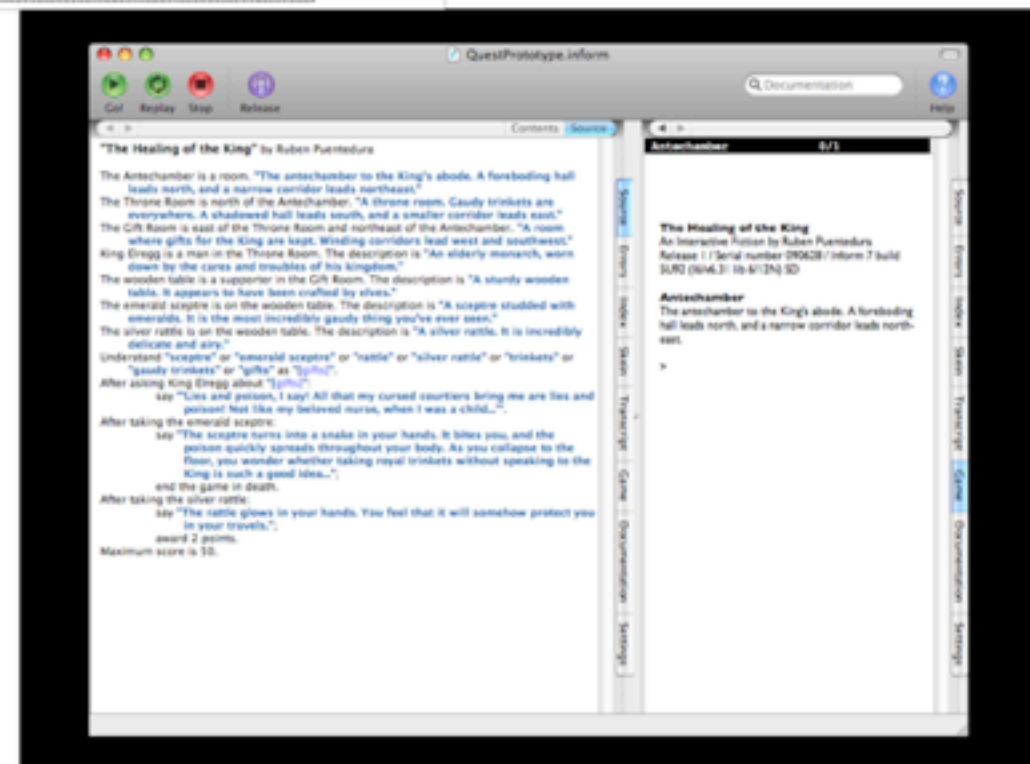
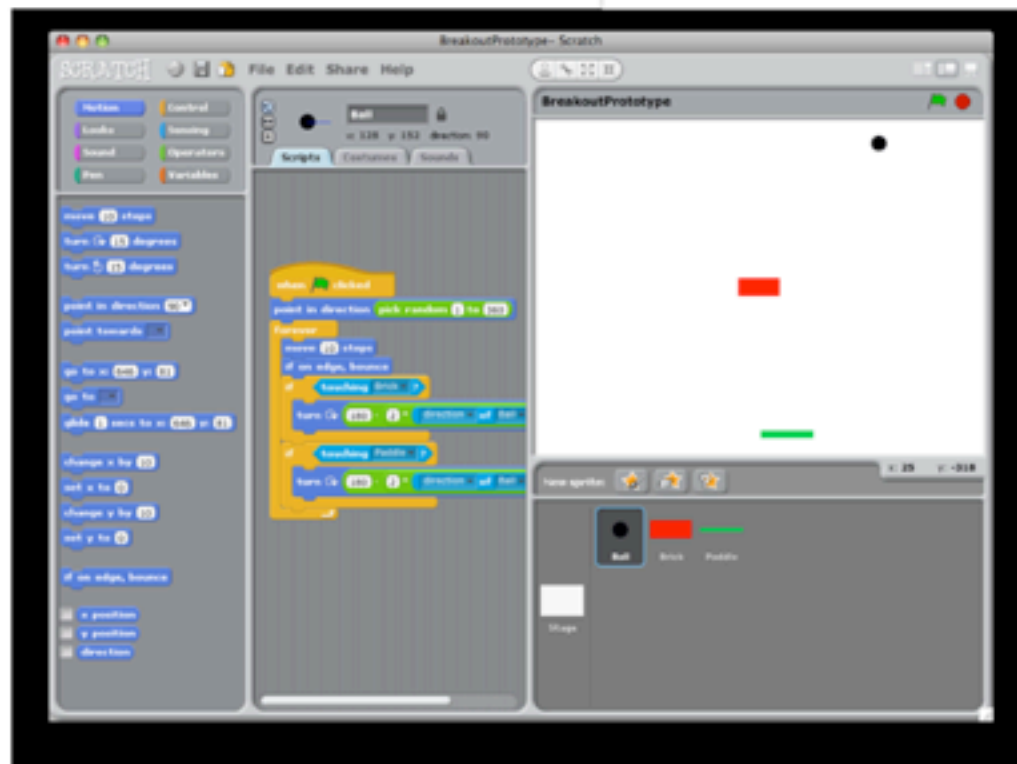
Keywords: computer games, simulation, electromagnetism, physics education.

Introduction

Many science educators advocate conceptual or qualitative physics, the notion that physics is best taught not by mathematical formulae, but rather through experiments, labs, demonstrations, and visualizations which help students understand physical phenomena conceptually (diSessa, 2000; Forbes, 1997; Hewitt, 2002). Consistent with the *Physics First* curricular movement, this perspective maintains that a deep, fundamental understanding of physics provides a solid basis for future science learning. How to engage younger students in complex physics thinking is a challenge, but computer simulations provide one intriguing way to engage students in the study of abstract, complex physical phenomena (diSessa, 2000; Dede et al., 1999). Digital technologies can immerse the learner in worlds that not only represent scientific phenomena, but behave according to the rules of physics. Simulated worlds can be programmed to behave by Newtonian or Maxwellian rules (Dede et al., 1999). By representing the simulation through digital gaming conventions, educators can potentially increase engagement while also fostering deeper learning, as learners engage in critical and recursive game play, whereby they generate hypotheses about the game system, develop plans and strategies, observe their results and adjust their hypotheses about the game system (Cordova & Lepper, 1996; Gee, 2003; Squire, 2003). Experiences in game worlds become experiences that students

Game Creation

Name	102 FAMILY OF ENTRANCES*	
Illustration		Development
Introduction	<p>... this pattern is an embellishment of CONCENTRATION SQUARE (94). CONCENTRATION SQUARE portrayed a series of rooms, in a large building or a building complex, with a major entrance or gateway into each room and a collection of minor doorways, gates, and openings off each room. This pattern applies to the relationship between these "minor" entrances.</p>	Solution
Problem Summary	<p>When a person arrives in a complex of offices or services or workshops, or in a group of related houses, there is a good chance he will experience confusion unless the whole collection is laid out before him, so that he can see the entrance of the place where he is going.</p>	Diagram
		Connections
	<p>In our work at the Center we have encountered and defined several versions of this pattern. To make the general problem clear, we shall go through these cases and then draw out the general rule.</p> <p>1. In our multi-service center project we called this pattern Overview of Service. We found that people could find their way around and we exactly what the building had to offer, if the various services were laid out in a horseshoe, directly visible from the threshold of the building. See <i>A Pattern Language Which Generates Multi-Service Centers</i>, pp. 113-115.</p> 	



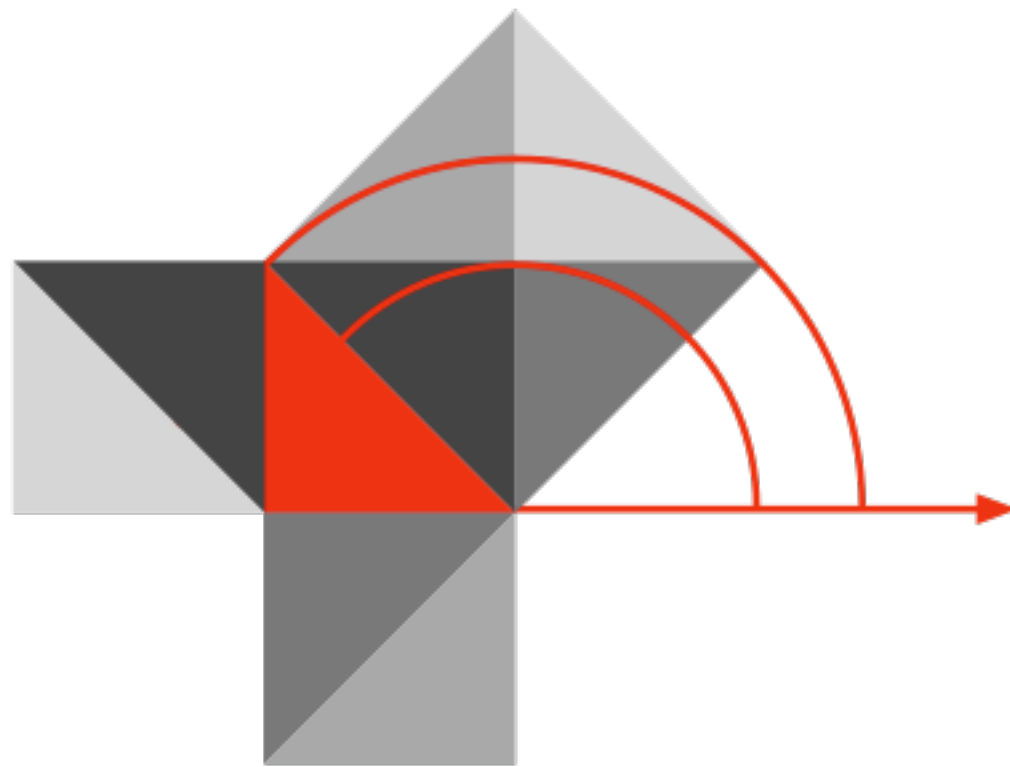
With Thanks To

- Jeff Mao, Learning Technology Policy Director, State of Maine
- Merrilea J. Mayo, Ph.D.
- The Maine Learning Technology Initiative (MLTI)
- The Ewing Marion Kauffman Foundation

Resources

- Bateman, C. and R. Boon. *21st Century Game Design*. Charles River Media. (2006)
- Bateman, C. *Designing for Different Play Styles: Demographic Game Design*. (2004) Available online at:
<http://www.cms.livjm.ac.uk/library/Archive/GDTW2004-Publications/ChrisBateman-Designing%20for%20Different%20Play%20Styles.v1.3.pdf>
- Puentedura, R.R. *Game And Learn: An Introduction to Educational Gaming*. (2009) On iTunes U at:
<http://deimos3.apple.com/WebObjects/Core.woa/Browse/education-maine.gov.2246057621>
More information at:
<http://hippasus.com/resources/gameandlearn/>

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