

Audience

Designing for the Audience: Past Practices and Inclusive Considerations

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Key Summary Points

1

Most research on designing for the audience centers on understanding personality, pleasure preferences, or player motivations. Structural and dramatic elements are integral to driving motivation and constructing game pleasures.

2

The physical and cognitive abilities of players should also be important when considering your audience.

3

Design should be inclusive in ways that look beyond demographics and assumed differences (such as gender differences). Particular attention should be paid to increasing diversity in representation, and decreasing bias and harassment in play.

4

Design should consider how to limit player avoidance of game or learning mechanics (through cheating or exploiting) and should craft ways to vary how players use game affordances and solve problems.

Key Terms

STEM	Audience
User research	Player types
Motivation	Pleasure
Game structure	Representation
Inclusive design	Gender
Race	Ethnicity
Sexuality	Identity
Ability	

Introduction

In Fullerton's (2005) *Game Design Workshop: A Playcentric Approach to Creating Innovative Games*, she reminds us that the role of a game designer, before anything else, is to be an advocate for the player—the audience (Fullerton, 2008). Making the audience central to the design process can be difficult, however, especially when there are multiple demands during production and development, and multiple perspectives on the design team.

The interesting and challenging thing about game development teams is the sheer breadth of types of people who work on them. From the hardcore computer scientists, who might be designing the AI or graphic displays, to the talented illustrators and animators who bring the characters to life, to the money-minded executives and business managers who deliver the game to its players, the range of personalities is Incredible... A big part of [a game designer's job]... is to serve as a sort of universal translator, making sure that all of these different groups are, in fact, working on the same game... Games are fragile systems, and each element is inextricably linked to the others, so a change in one variable can send disruptive ripples throughout. (Fullerton, 2008, pp. 6-7)

We often discuss game design from the perspective of the experiences we are creating and not from the perspective of the audience. As Fullerton points out, however, while it can be easy to get caught up with new graphics and features, the balance of all of these features into a solidly playable system is what actually excites and hooks players.

Game designers ask players to engage in Huizinga's "magic circle," where game rules create opportunities for play within the safety of constraints; players can perform actions and see things from perspectives they are normally unable to do in the confines of the "real world" (Salen & Zimmerman, 2003). The kinds of actions afforded in the circle are especially powerful from an educational perspective because learners can take on roles, simulate experiences, and interact with and view phenomena that would be difficult otherwise (e.g., Gee, 2004; Squire, 2011).

As we think about education and learners, some of the challenges faced by commercial games when it comes to designing for audiences become especially important to consider. The next section will expand on this further as we examine the prevailing theories and perspectives around designing for the audience.

Case Study One: *Gone Home* as an English Text (Written by Paul Darvasi)

Gone Home is a first-person exploration game that was used as a text in three senior high school English classes at Royal St. Georges' College, an all-boys independent school in Toronto, Canada. Fifty-seven students played the game and then carried out relevant activities and responses over the course of a two-week unit. Prior to starting the unit, players were sent redemption codes that allowed them to load the game to their laptops. Students played independently and progressed at their own pace.

Set in 1995, *Gone Home* is an interactive and non-linear narrative that develops through the player's exploration of a family home. Players reconstruct the family drama by piecing together documents, artifacts and personal possessions they find around the old mansion. The central story revolves around a teenage girl's adolescent romance and coming out story, while her father struggles with his past and a failed writing career, and her hardworking mother negotiates the temptations of an extramarital affair.

The game substitutes a traditional English text and was implemented without modification. Both its content and functionality make it a relevant selection for classroom use. Unlike many long-form games with a narrative focus, *Gone Home* can be easily played in less than three hours, has low hardware requirements, and has a user-friendly interface. The game does away with levels, points and achievements, which make for a smooth and non-competitive gameplay experience. It is also scrubbed of gratuitous sex and violence, but retains an "edge" by virtue of the house's gloomy and haunting atmosphere. Its focus on character development through environmental storytelling naturally lends itself to a consideration of the setting, characters, perspectives and non-linear narrative structure—concepts relevant to any secondary school literature class. Its reliance on an assortment of realistic and diverse documents and objects such as *X-Files* videos, graffiti-covered lockers, and journal pages also expose students to a wide range of written voices and forms.

Guided activities and response strategies include:

1. **A written "annotation" of a single room in the game.** A combination of screenshots and notes were employed to unpack the first room they entered, which acquainted students with all the main characters, basic gameplay functions and let them practice taking in-game screenshots.
2. **Individual tracking assignments.** Students selected topics to track and were tasked to take relevant notes and screenshots as they played. Tracking topics included gathering information on specific characters, identifying and researching objects endemic to 1995, finding and contextualizing intertextual references to other video games, and the copious allusions to the Riot Girl movement. Some kept notes as they played, others opted to play through once and take notes during a second run.
3. **A study of tone and mood**
4. **Written reviews of the game**
5. **Group presentations**

These directed activities encouraged purposeful and deliberate exploration, without restricting player agency. After the gameplay phase, players were grouped together according to their tracking assignments and collaborated on presentations that were delivered to the rest of the class. Finally, they read examples of game reviews, and then wrote their own which they then published in gaming websites such as Metacritic, Gamespot, and IGN. The game's developers added an optional in-game commentary a week before the unit was launched and many students played the game a second time with the commentary switched on, which provided valuable insights that enhanced their reviews and presentations.

Most players seemed engaged and invested throughout. They remained focused during in-class play, and many offered unsolicited comments about enjoying the experience. Some students remarked that the game was not for them or that they found the graphics subpar. Discussions led to questions of the characters' motives and the realism of the game, and students traded knowledge about the whereabouts of certain spaces and items. One high performing student, who does not play video games outside of school, noted he enjoyed the experience and found it easier to remember narrative details than he did when reading a story or novel. The reviews showed critical thought on storyline, gameplay and production values, and the quality of their final products were generally high, perhaps because they were destined for public consumption. The final presentations were informative, engaging, and visually appealing and collectively addressed most narrative elements of the game. *Gone Home* could easily be implemented in any high school English class with access to laptops and/or desktop computer.

Key Frameworks

When designing for an audience, one of the key elements to take into consideration is how to make them connect emotionally and engage with the game (Fullerton, 2008). This means different things to different players, and not everyone will engage with games similarly. In fact, some game designers and scholars have proposed that there are different player types, who have different intentions and pleasures that motivate them.

Player types and personalities

Bartle (1996), credited with creating the first multiuser dungeon (MUD) and online games, categorized MUD players as ascribing to one of four player types: achievers, explorers, socializers and killers. A personality test was created based on his work and his theory has been updated for virtual worlds and contemporary multiplayer games (though the updated taxonomy has not been widely cited or used). Bartle's original taxonomy was based on hundreds of forum posts in response to the question of what people wanted out of a MUD. He stated that there were 15 key respondents and about 15 complementary ones, made up of the top players of one popular MUD who helped shaped his theory. He found that each player leaned a bit toward each of the subgroups, but was primarily characterized by one.

1. **Achievers** are primarily concerned with achieving the goals of the game and they enjoy challenge.
2. **Explorers** are concerned with getting to know as much as they can about the world, sometimes beyond the play space and into the actual system and its structural makeup. They enjoy discovering the world and its boundaries.
3. **Socializers** like to use the game's communication system and interact with other players, as part of their play. They enjoy how other players can contribute to their experiences of the game.
4. **Killers** are interested in "acting on other players" in ways that are mostly understood as harmful but can also "appear helpful" (Bartle, 1996, Interest Graph Section, para. 8). They are often players who want to "demonstrate their superiority over" (Bartle, 1996, Interest Graph Section, para. 8) other human beings and desire showing off their knowledge and skills against real people instead of non-playable characters (NPCs).

Bartle proposed that a stable MUD, or game space, was designed to keep all player types in equilibrium. He felt it was the job of designers and administrators (or, these days, community managers) to think through how the system was designed and maintained in striking this balance.

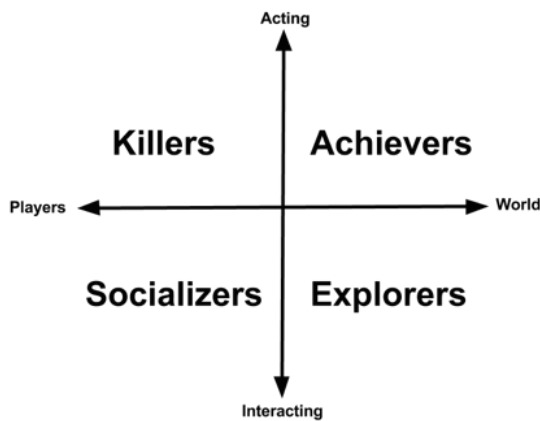


Figure 1. Graph of how Bartle's four player types cover a space.

Figure 1 shows a graph of Bartle's four player types and how they cover a space. The vertical axis represents acting on or interacting with, and the horizontal axis represents players or the world. To interpret the player type, one would locate its position on the axis. For example, Achievers act on the world (hence its position between acting and world) whereas Socializers interact with other players, Explorers interact with the world, and Killers act on other players.

On the other hand, Yee (2006) raised the concern that Bartle's Taxonomy of Player Types, while widely cited, had not been put to the test. For example, he questioned whether the four player types were truly independent from one another. Players may have different motivations to take on different characteristics at different times and with different games; in these cases, types would be fluid and not fixed. Fullerton (2008) argues that Callois' (2001) seminal *Man, Play and Games* brings focus to the kinds of pleasures that different game types imbue for players. For example, most strategy games, whether they be board-base games (such as *Chess*), turn-based digital strategy games (such as *Civilization*), or real-time strategy games (such as *Starcraft*), have rule-based and competitive elements, emphasizing certain kinds of play. These kinds of games would not only embody different kinds of playful experiences, they would also be differentially appealing to players.

Vandenberghe (2012), a creative director at Ubisoft, presented on the *Five Domains of Play* during the 2012 Game Developer Conference. He proposed that psychology's big five personality traits could easily and accurately predict a player's game choices and that each of the five personality traits (openness, conscientiousness, extroversion, agreeableness, and neuroticism) is related to the motivations that drive behavior and choices in general, which also includes games. In other words, each personality trait maps well to what he coins are the five domains of play:

1. **Novelty:** The newness of the experience.
2. **Challenge:** The amount of effort or self-control the player is expected to use.
3. **Stimulation:** The engagement of the play experience.
4. **Harmony:** The relation of the rules to social and player-to-player accord in game.
5. **Threat:** The presence and strength of negative emotional triggers.

Vandenberghe urged designers to “appeal to both ends of each facet,” (Vandenberghe, 2012) believing that each player mapped onto the domains of play differently. He recognized, however, that while we cannot always design for everyone, he encouraged designers to think about personality and play style, beyond the demographics (and assumptions) that are often used. Vandenberghe's work connects theories of personality with theories of motivation, but some researchers have looked more exclusively at what motivates players to play in different complex gaming environments. In fact, he and his colleagues contend that the Big Five model of personality traits does “an excellent job of predicting taste... [and] relates to the acquisition phase of game engagement... [as well as] points the way for the reasons why people will quit playing” (Brink et al., 2013, p. 1). They have conceded that, while the Big Five predicts which games people are likely to gravitate toward, it does not predict behavior well once engaged, and that theories of motivation do a much better job.

Vandenberghe and his collaborators juxtapose their work to that of Ryan, Rigby, & Przybylski (2006) who, along with Yee (2006), argue that motivation to play is fluid and highly dependent on context. Ryan et al. (2006) and Yee (2006) also focus on understanding player motivations, as opposed to personalities or player types.

Player Motivations

Ryan et al. (2006) focuses on the role that self-motivation and determination played in human behavior—including playing games— which stemmed from Ryan and Deci's Self-Determination Theory of Motivation (Ryan & Deci, 2000). They proposed that individuals' motivations to play video games could be accounted for by how well the game is able to satisfy basic psychological needs. These basic needs were:

1. **Competence:** How much the game and its associated tasks allow for a sense of accomplishment or mastery.
2. **Autonomy:** How much the game provides choice over tasks and goals, and sustains the ability to feel a sense of control, as opposed to being controlled by feedback.
3. **Relatedness:** How much the game allows for being connected or related with others.

Rigby & Ryan (2007) expanded on this theory by creating the player experience of needs satisfaction (PENS) applied model and methodology. They felt that the PENS model needed to be thoughtfully applied to the game mechanics (controls and rules), the gameplay (activity in the game) and player narrative (uncovering of elements related to the character over time). To optimize on player competence, games should give players the opportunity to apply and demonstrate mastery, provide positive, yet relevant feedback as well as an overarching sense of continual success for sustained enjoyment. There should further be a sense of player agency, which combines competence and autonomy, by allowing players “who they will be...and when, where and how they take action” (Rigby & Ryan, 2007, p.12). To create a sense of autonomy, games should allow, as much as possible, opportunities for players to act, through interactive elements (such as NPCs and items) and ways to meaningfully interact with them (through talking to characters or collecting items). Relatedness can often be achieved through optimizing the kinds of social interactions available online. While these social interactions can be different in shape and form (i.e., interacting in short matches in a first-person shooter is very different from sustained, long-term teamwork in Massively Multiplayer Online Role-Playing Games), allowing for player contact and relationship building is important to satisfaction of player needs with games.

In analyzing Massively Multiplayer Online Role-Playing Games (MMORPGs), Yee (2006) found that play motivations do not suppress each other; in other words, players can have a range of emotions that influences what they play and how they play. He found that there were three key overarching motivation components that could be described:

1. **The achievement component:** This is made up of advancement (the desire to gain power, or achieve symbols of status or wealth), mechanics (interest in analyzing the underlying rules of a system for optimization), and competition (the desire to challenge and compete with others).
2. **The social component:** This is composed of socializing (the desire to chat, make friends and help others), relationships (interest in forming bonds with others), and teamwork (feeling satisfaction from collaborating with others toward a group effort).
3. **The immersive component:** This involves discovery (finding hidden or unknown things that others might not find), role-playing (creating an interesting and complex persona, which often involved interacting with other players), customization (creating unique looks for one’s character), and escapism (using the game or virtual space to escape reality).

While he discovered some gender differences, with males exhibiting higher achievement motivations and females having higher relationship building motivations, he found that this was more correlated with age than gender. Specifically, he found that older players were less likely to be achievement oriented, but that female players also tended to be older than male players (Yee, 2008). Also, male and female players were equal in their social motivations, but socialized differently, hence why only the subcomponent of relationship building was significantly different across gender. However, more important than gender and age differences were his findings around the variability of why players play MMORPGs leading him to conclude that “this variation suggests that one reason why MMOs are so popular may be that there are many subgames embedded within a larger system” (Yee, 2008, pp. 89).

Radoff, author of *Game On* (2011), sought to simplify the work of Yee and Bartle by making them applicable to any game genre. He felt that two axes could be used to define the environment the player is in: the horizontal axis represents the number of players involved in gameplay and the vertical axis represents how the player is informed they are winning in the form of motivation. For example, quantitative feedback or rewards could include leaderboards and points, whereas qualitative feedback or rewards would be stories or emotional-based cues. Depending on the play environment, and number of players, different motivational elements would emerge. This framework, however, has mainly been applied to creating gamified (or game inspired) contexts outside of games as opposed to within them. In many ways, it breaks down what works well in digital games (e.g., badges, virtual goods) to apply them to other contexts to stimulate motivation, rather than mapped onto gameplay in digital games. Radoff's work is a good segue into understanding game pleasures and emotion.

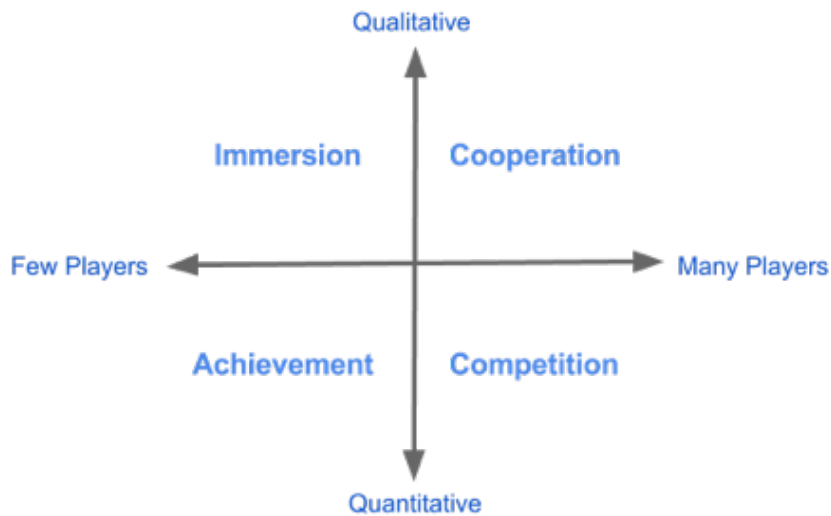


Figure 2. Radoff's Model of Player Motivation

Game Pleasures and Emotion

Schell (2008), professor and CEO of Schell Games, a game design company, proposes that we often look to demographics to get at what groups find pleasurable. As Lazzaro (2008), president of XEODesign, a player experience design consultancy, contends, however, designing for demographics can limit an audience, specifically if there are gender assumptions. Instead of demographics, Lazzaro has proposed designing for core game pleasures.

Game designer Marc LeBlanc created a taxonomy of eight primary game pleasures. He focused on several kinds of experiences that elicit pleasure:

1. **Sensation:** pleasures that involve the senses and sensations, like seeing something beautiful and hearing something pleasurable. These are often delivered through game aesthetics.
2. **Fantasy:** pleasures that involve imagination and experiencing yourself as someone or with other attributes.
3. **Narrative:** pleasures of experiencing a narrative unfolding through play.
4. **Challenge:** pleasures of solving problems through play.
5. **Fellowship:** pleasures of friendship, cooperation, and community achieved through gameplay.
6. **Discovery:** pleasures of discovering new things through gameplay, which can include exploring a game environment or finding out a new strategy or exploit.
7. **Expression:** pleasures of creating something or expressing oneself through gameplay or through game affordances (i.e., creating a level someone else can play, or creating outfits for your character).
8. **Submission:** the pleasure of entering the fantasy space (“magic circle”) of a game and leaving the real world behind.

Taxonomies are not without criticism. The biggest critique is whether they are exhaustive enough. Schell (2008) contends that LeBlanc and Bartle’s taxonomies have gaps, which could “gloss over subtle pleasures that might be easily missed” (p. 111). He adds the following additional pleasures to LeBlanc’s Taxonomy, which he states may not cover all of the variety of pleasures derived from human experience:

1. **Anticipation:** The pleasure of knowing something is forthcoming.
2. **Delight in another’s misfortune:** This pleasure is often experienced when someone who has been unjust gets what was coming to them.
3. **Gift giving:** The pleasure of giving a gift and making someone happy by doing so.
4. **Humor:** The pleasure of something funny.
5. **Possibility:** The pleasure of being able to choose from many options.
6. **Pride in accomplishment:** The pleasure of satisfaction in having achieved something.
7. **Purification:** The pleasure of clearing or cleaning something out (such as clearing the board or killing all of the enemies).
8. **Surprise:** The pleasure of revelation or astonishment.
9. **Thrill:** The pleasure of experiencing terror while safe and secure.
10. **Triumph over adversity:** The pleasure of accomplishing something difficult or with many obstacles.
11. **Wonder:** The pleasure of amazement.

Both of these taxonomies raise issues about whether they could ever cover all of the possible pleasures human beings have come to find enjoyable and motivating. Through extensive interviews and observations of hardcore, casual and non-gamers, Lazzaro (2004) found that there are four keys to

unlocking player emotions. Not all players like the same kinds of things but overall “players play to experience these body sensations that result from and drive their actions” (p. 7). According to Lazzaro, top-selling games utilize at least three of the four keys. Each key is a reason people play, and combining each of the keys makes for a “deeply enjoyable game for a wide market” (p. 3). The following are Lazzaro’s four keys:

1. **Hard fun:** This refers to creating opportunities for the player to overcome obstacles and to pursue a goal. Challenge focuses attention, creates emotions such as frustration and inspires creativity in developing and applying strategy. Players are often rewarded with feedback and they often use Hard Fun to test their skills and feel accomplishment.
2. **Easy fun:** This refers to maintaining player focus with player attention instead of a winning condition. This is often achieved through “ambiguity, incompleteness and detail” (Lazzaro, 2004, p. 4) as well as rich stimuli (like intricate landscapes or enticing rhythms), which encourage players to explore and immerse themselves.
3. **Altered states (updated to “serious fun”):** This involves creating opportunities for players to experience different emotions, senses and interactions. Players can escape from reality or experience relief from their thoughts or feelings.
4. **The people factor (updated to “people fun”):** This involves allowing players to use games for social experiences, including competition, teamwork, social bonding, and personal recognition.

Structuring Play

So far, we have discussed the motivational or pleasurable capacities of games, without necessarily thinking concretely about the structural and dramatic elements that create them. Fullerton (2008) suggests that there are five interrelated elements that are key to engaging the player: challenge, play, premise, character, and story.

1. **Challenge:** Challenge is an important element in creating the tension they must resolve through gameplay, which is often highly motivating when designed well. We have to balance how great or small the challenge may be, as frustration or lack of engagement can occur when challenges are too large or too small, respectively.
2. **Play:** According to Fullerton, “play itself is not a game [but] the more rigid systems of games can provide opportunities for players to use imagination, fantasy, inspiration, social skills, or other more free-form types of interaction to achieve objectives within the game space, to play within the game, as well as to engage the challenges it offers” (Fullerton, 2008, p. 34). How rigid or free form the play space is designed is important for engagement, because different players will approach its affordances and constraints differently.
3. **Premise:** The premise of the game gives context to the rest of the elements because it sets the backdrop, the environment, and the roles of the players and characters.

4. **Characters:** Characters “are the agents through which dramatic stories are told” (p. 40) but they can also provide players “vessels” through which to experience situations, conflicts or live vicariously through.
5. **Story:** Unlike the premise of a game, stories tend to unfold during gameplay, and not all games contain a story. Special thought should go into how the story works with the intentions of the game and how it unfolds.

Concerned that designers tended to focus on pleasure and motivation more than capacity, Brathwaite & Schreiber (2008) proposed six key areas to take into account when targeting your audience: reading ability, learning curve, cognitive ability, learning style, physical ability, as well as tactile desires. While tactile desires do not necessarily highlight capacities, they are often overlooked as part of the appeal. As a result, they highlight the importance of marketing and packaging in encouraging play.

1. **Reading ability:** Brathwaite & Schreiber (2008) caution designers not to overestimate the reading abilities of children, and even some young and older adults. Using auditory feedback, even if included with text, will help those with reading difficulties or limitations.
2. **Learning curve:** They encourage designers to think about how game controllers and in-game attributes relate to perceived learning curves because individuals often “dismiss things before they try” them (p. 149). When designing peripheral devices and in-game feedback, like health meters and heads-up displays, think about accessibility. Design for common references, like existing controllers, or feedback systems, while also thinking about how you would translate those elements for a novice so they are not overwhelming.
3. **Cognitive ability:** When designing for different audiences, think about the kind of cognitive challenge present, and whether it would be capable or interesting for that target age group’s cognitive ability. For example, some games are rather complex and difficult for young children, while others do not provide the kind of mental challenge certain advanced players might find stimulating.
4. **Learning style:** Citing the work of Graner Ray (2004), Brathwaite & Schreiber (2008) contend that men and women gravitate to different learning styles (though this is up for debate, as will be discussed later).
5. **Physical ability:** Thinking about the physical abilities of an audience is also crucial. Designing controllers that are too large for some users, or designing games that require absolute precision with a mouse may limit who can play your game. When designing, there should be some thought into whether, how and why you are limiting your audience through the physical requirements of your game.
6. **Tactile desires:** Brathwaite & Schreiber (2008) also point out that the tactile affordances of your game, from the packaging, to the artwork, send strong signals to your audience about its quality and emotional attributes.

Case Study Two: *Jewish Time Jump: New York* (Written by Owen Gottlieb)

Jewish Time Jump: New York is a mobile placed-based augmented reality game and simulation in the form of a situated documentary. It is designed to act as a learning intervention, not only to engage learners and spark their curiosity in exploring content knowledge in modern Jewish history, but also to deepen their historical thinking and their civic participation, and in so doing, seek a means by which a short-term intervention might have a longer-term effect on learner engagement with modern Jewish history. The Jewish social justice concern of *Tikkun Olam*, or healing the world, is realized in the game through centering on civic engagement in a pluralist democracy. The game's design is concerned with presenting engrossing historical narratives in which players investigate multiple, conflicting perspectives and they come to explore the constructed nature of historical narrative. They learn about issues based advocacy and organizing, as well as citizen journalism and political power structures in an historical context.

Jewish Time Jump: New York works to push the boundaries of the genre of situated documentary (Mathews & Squire, 2010) in terms of production, game mechanics, and narrative devices. The player's geographic place is directly related to the game theme, events, and setting. The game "augments" reality, so while standing in Washington Square Park, or the buildings nearby. Players receive images based on their GPS location—images from over 100 years earlier—giving a place-based experience of the historical narrative.

In this game and interactive story, players travel back in time to take on the role of reporters working for the fictional *Jewish Time Jump Gazette*. They are tasked with bringing a story back to their editor that was "lost in time." They "travel" back to 1909 in Washington Square Park in Greenwich Village, New York, where they land on the eve of The Uprising of 20,000, a garment workers' strike, led in large part by a number of young Jewish women were among those who led 20,000 shirtwaist workers out into the streets. It remains the largest women-led strike in U.S. History.

The uprising occurred two years before the devastating Triangle Shirtwaist Factory Fire. The Uprising also occurs eleven years before women have the right to vote. Players gather perspectives from digital characters with opposing views, receive items such as digital reproductions of original Yiddish newspapers with a translation feature, and track down elements of their story, trying to complete their quests before time runs out. They face obstacles such as being mistaken for strikers by local shtarkers, who were thugs hired by owners as strikebreakers, and who often attacked the women.

The project that would become *Jewish Time Jump* originated in the desire to bring advances in contemporary research in games for learning to bear on Jewish education. Jim Mathews' *Dow Day* (Mathews & Squire, 2010) served as the jumping off point. *Dow Day*, which takes place on the campus of the University Madison-Wisconsin, is a mobile, augmented reality situated documentary in which players act as reporters during the 1967 student protests against Dow Chemical, who was recruiting on campus. They meet digital characters of protesters, administrators, and police and are fed stills, videos,

and historic artifacts from 1967. For the development of *Jewish Time Jump: New York*, this investigator formed, and led a New York based team of historians, archivists, digital graphic and video artists, and game designers. The New York team also collaborated with Mathews, David Gagnon, and the ARIS Team at the University Wisconsin-Madison.

ARIS, or the Augmented Reality and Interactive Storytelling platform is an open source platform, based out of the University of Wisconsin-Madison, and the inheritor of an early project at MIT. *Dow Day* had been ported to *ARIS*, and to this day, *ARIS* remains the only open source, readily available technology for GPS, location-based game-design available for mobile devices. *ARIS* runs on iOS (iPhone and iPad). *ARIS* allows for interactive storytelling and triggers events by GPS location. At the same time, the platform itself has constraints, and so the model of *Dow Day*, which was already running on *ARIS*, was used as a basis for the initial kinds of gameplay that could be devised. While development on *ARIS* was done over the course of *Jewish Time Jump*, the initial design work had to begin from the then-current constraints of *ARIS*. *ARIS* remains in development and *Jewish Time Jump* remains in iterative design. *Jewish Time Jump*'s development has contributed to the *ARIS* platform in a number of ways, including the addition of haptics (vibration scripts), and a variety of new design-editor tools including universal location controls.

Implications for the game are potentially broad, including a variety of player-audiences both inside and outside formal and informal Jewish and secular social studies education settings. For the purposes of the research study, and the focus of design, the initial target audience was fifth to eighth graders and their families, primarily in Reform Hebrew supplementary schools. This choice was to attempt to address a population of Jewish learners with high attrition from secondary schools. Could an intervention potentially impact attrition numbers? The researcher is still working on answering this research question, and understanding how the game may address attrition from formal and informal Jewish education settings. Initial results suggest that numerous design elements can contribute to deepening engagement in perspective-taking, and historical investigation with an emphasis on civic participation in a pluralist democracy, informed by a player's religio-ethnic-communal perspective.

Key Findings

In summary, these frameworks explore and highlight the importance of designing for the variability in personalities, pleasures, motivations, and abilities. These frameworks make a strong case for 1) embedding content within reachable, yet challenging goals, with strong feedback and mastery ability, 2) allowing for delightful and unexpected experiences that could not necessarily be achieved in the real world in the same way, 3) allowing for meaningful interaction with others, in variable ways, and 4) being aware of the accessibility of the designed space, as well as the variability of the audience for which it is being designed.

Learning and audience

In recent times, there has been a bit of a debate about whether commercial and serious games can benefit learning, with several studies on the subject (for example, see Connolly, Boyle, MacArthur, Hainey & Boyle, 2012; McClarty, Orr, Frey, Dolan, Vassileva, & McVay, 2012; Shute & Ke, 2012; Wouters, vanNimwegen, vanOostendorp & vanderSpek, 2013; Young et al., 2012). The most compelling evidence seems to state that games designed for learning (i.e., serious games) are significantly beneficial for learning and retention over traditional instruction, though are not significantly motivating (see Wouters et al., 2013).

The research on learning with digital games has often focused on the motivational and learning properties of games. As such, most of what we know about effective learning with games focuses less on learning styles and more on their multisensory potential (in other words, how effective game mechanics, attributes or design elements aid in learning, motivation or engagement). This may be in part because the research on learning styles has mostly remained inconclusive (Pashler, McDaniel, Rohrer, & Bjork, 2008).

Wouters et al. (2013) suggest that effective learning with serious games needs to 1) be supplemented with other instructional methods, 2) incorporate multiple training sessions, and 3) allow learners/players to work in groups. Their findings are very similar to findings involving other learning technologies, particularly computer-assisted instruction. Wouters et al. (2013) also offer that one reason games may not have been found more motivating than traditional instruction may have been competing outcomes such as “learning versus playing or freedom versus control” (p.13). They cite that the world of instructional design and game design are still in the process of alignment.

Koster (2005) outlines that learning can be problematic, particularly because learners look for shortcuts (or cheats). Cheating, however, does not allow us to fully understand a concept, and is often reflective of problems in the design. Cheating can involve using codes to easily gain money or experience, or downloading modded weapons or armor developed by others so that you can gain an unfair advantage. Exploiting the game, on the other hand, involves very experienced play. It involves finding work-arounds not intended by the developers, which can put certain players at an advantage when used. Someone who has mastered and explored the game system is better able to do this. Koster points out that human beings often want to get better at things and one way to do this is to make things more predictable and easier by exploiting (i.e., taking unintended shortcuts or racking up experience beating weaker opponents). As designers, however, we do not want players/learners to circumvent the challenges we have put in place.

Koster (2005) recommends that the game system can be successfully designed to minimize cheating and exploitation, as well as enhance learning. He recommends incorporating the following elements:

1. **Preparation:** Allowing a player to prepare before a given challenge with choices that can affect their chances of success (i.e., allow them to practice in advance, or heal before facing a strong opponent).
2. **A sense of space:** Create this through the landscape, and players.
3. **A solid core mechanic:** Create an intrinsically interesting rule sets.
4. **A range of challenges:** Vary the challenges they encounter in interesting ways.
5. **A range of abilities required to solve the encounter:** Provide multiple kinds of tools with multiple abilities. In many games, these abilities unfold over time as you play. Koster (2004) provides the example of checkers, where you learn to force the player to make moves that work against her over time, but not the first time you play.
6. **Skill required in using the abilities:** Vary the kinds of elements or tools a player has during play. Different resources and how they are applied can lead to success or failure, and skills develop over time as they learn to apply resources differently.

To ideally make a game a constructive learning experience, it should include:

1. **A variable feedback system:** A player should receive feedback on their performance and ways to improve it.
2. **Ways to deal with the mastery problem:** Finding ways to tailor the game to the player's level of experience. High-level players will not learn anything new from easy experiences and will end up exploiting; inexperienced players cannot learn from games that are too difficult.
3. **Failure should be part of the learning experience:** While Gee (2004) points out that games lower the consequences of failure, Koster (2004) feels that there should be an opportunity cost. You are more likely to learn if you are forced to prepare differently after a failed task.

Creating opportunity costs for failure can take many forms and does not have to involve losing it all. In fact, most contemporary games allow players to start near a particularly difficult part of the game (instead of going all the way back to an earlier or incredibly far point in the game). As Lazzaro (2004) points out, frustration can inspire focus and creativity, but it has to be effectively designed to do so. We do not want learners to abandon the objective, but we want them to understand there is an opportunity cost to not completing the experience as intended. We should try to scaffold that in the form of a learning-oriented goal or activity.

A further and fundamental consideration when designing games for learning is how formal or informal educational content is presented to the learner. "Learning mechanics are patterns of behavior or building blocks of learner interactivity, which may be a single action or a set of interrelated actions that form the essential learning activity that is repeated throughout a game" (Plass, Homer, Kinzer, Frye, & Perlin, 2011, p. 3). In designing for learning, Plass et al. (2011) make the case that learning mechanics must further be intrinsically and meaningfully connected with game mechanics. They argue that the learning mechanic must be grounded in the learning sciences or learning theory.

Learning mechanics describe which kinds of functions and scaffolds are needed in the environment, though not the actual game mechanics involved, which can vary by game design. An example of an ineffective learning mechanic would involve interrupting a racing or shooting game with popup “educational” questions before play could continue (Plass et. al., 2011). An example of an effective learning mechanic might be having a learner select or integrate related objects, though how they select or integrate them through game mechanics could vary by game or interface. For instance, a learner could drag one object onto the other, such as in a simple matching game, or break objects apart and put them back together again in new and meaningful ways, such as in *Minecraft*. The goal of the activity and the game type employed should reflect the learning outcomes desired (i.e., learning related objects or categories versus learning properties of objects that could make new objects).

Designing for inclusive learning

For many years, games were designed for demographics, which often meant designing for stereotypes and assumptions of what people liked according to their gender (Lazzaro, 2008). Female players who enjoyed playing what was considered male-themed games were often not researched or marketed to because they were thought of as “oddities” (Taylor, 2008). Some felt, however, it was important to create a market and design for female play precisely because it would help to create more common ground and encourage development for female interests (Cassel & Jenkins, 1998).

Contemporary research suggests that females and males enjoy more in common in games (Lazzaro, 2008). In fact, recent studies have found that once females are given equal chances to train, gender differences decline and skill sets that often put inexperienced female players at a disadvantage level out (see Feng et al., 2007; Jensen & deCassel, 2011; Vermeulen et al., 2011). For a full review on the evolution of this literature, see Richard (2013a).

Research highlights that more is going on than differences in assumed gender preferences. Recent events and research suggests that females experience a significant amount of harassment online. In fact, they are three times more likely to experience harassment when using voice chat to play online (Kuznekoff & Rose, 2013). Harassment and gender discrimination can play a large role in discouraging females from playing and participating equally in gaming and learning opportunities from games (Richard, 2013c; Richard & Hoadley, 2013).

Less has been studied regarding ethnicity and race. Studies have found that ethnic minorities do not have the same access to high tech computer equipment as Whites (DiSalvo & Bruckman, 2010) and that they are more likely to experience racial harassment when playing online (Nakamura, 2009; Gray, 2012; Richard, 2013c). Studies have found that ethnic minorities can be profiled by the way they speak or by their avatars. Studies have also found that players want to have the opportunity to play as their ethnicity, and minorities are not always allowed to choose avatars that look like them (Kafai et. al. 2010).

Shaw's studies (2012a; 2012b) have found that LGBTQ (Lesbian, Gay, Bisexual, Transgender, and Queer), gamers (also known as "gaymers") are more concerned about finding places where they can express their experiences, than the lack of LGBTQ characters. She attributes this in part to the need to find safe spaces from bigotry, as well as anxiety over exploiting gay identity.

Overall, research demonstrates that marginalized gamers, who are overwhelmingly female, minority, and LGBTQ, are more likely to be negatively affected by exclusionary practices in game spaces (Gray, 2012; Kuznekoff & Rose, 2013; Richard, 2013c; Richard, 2013d; Shaw, 2012a; Shaw, 2012b), which affects their ability to identify with gaming (Richard, 2013d; Richard & Hoadley, 2013; Shaw, 2012a; Shaw, 2012b), develop confidence in their skills (Richard, 2013d; Richard & Hoadley, 2013), and ultimately learn from games (Richard, 2013c; Richard, 2013d; Richard & Hoadley, 2013).

Research shows that the absence of female and ethnic minority characters in games makes female and ethnic minority players feel they do not belong and reinforces others feeling they do not belong (Lee & Park, 2011; Behm-Morawitz & Mastro, 2009). Further, research shows that stereotypes of ethnic minorities and sexualized female characters make female and minority players feel less confident in their abilities, and reinforce stereotypes that are negative in general (Dill & Burgess, 2013; Miller & Summers, 2007).

Richard (2013d) conducted a mixed-methods study of game players and online communities where she looked at players' gender, ethnicity, sexuality (among other demographics), gaming identification, and gaming sense of ability. She found that female and ethnic minority players were more vulnerable to stereotype threat (stress caused by negative stereotypes aimed at your gender or ethnic group), which would affect their performance and confidence with games and learning from games.

Specifically, through her three-year ethnography, which involved playing and participating in online and offline console and PC gaming, she found that harassment was a persistent and prevalent gatekeeping activity that marginalized female and ethnic minority play and participation in the space. Females were more likely to be harassed, though ethnic minorities (specifically, African Americans and Latinos) also experienced harassment around ethnic characteristics, when they were easy to discern, typically through "linguistic profiling" (Gray, 2012) or through profile stalking (i.e., the act of looking up another player's profile to figure out their gender, cultural background, or sexuality (Richard, 2013c)). Richard (2013d) further found that a female-supportive (yet co-ed) community reduced stereotype threat vulnerability for females, as well as increased confidence across gender (Richard, 2013d; Richard & Hoadley, 2013). Her data showed support that harassment and negative stereotypes in games could affect players differently (specifically females and ethnic minorities). When designing games for learning, stereotype threat is particularly important because it can affect how people perform on learning tasks along with long-term identification with that potential learning medium.

Assessment Considerations

There is not necessarily one way to understand player experience, but prevailing methods have used quantitative measures (typically through surveys), qualitative measures (typically through interviews or ethnography), or a combination of both. Survey measures can come in various forms and depend on what is being measured. When investigators are interested in how a specific game might affect player or learner outcomes, they may be applied concurrently (or at some point during game play), or retrospectively, involving reflecting upon game play. Some survey measures are more interested in overall characteristics of players or their views on their overall experiences, so measuring how one particular game affects them may not be as important as players' sense of how certain games or experiences around games shape them or motivate them.

Many survey measures, however, as well as interviews and related measures (e.g., think alouds), are considered subjective, because individuals have to reflect on their conscious meaning making around their experiences. Survey measures, interviews, and similar reflective measures are useful in understanding player experiences, especially when point of view is important. When measuring social experiences around play, for example, point of view and personal experience may be important.

Particularly when dealing with survey data, issues of validity and reliability are important. Validity issues concern whether an instrument is measuring what it is intended to, while reliability issues concern whether the instrument remains dependable over time. Yee's critique of both Bartle's player types (2006) and the Big Five personality traits (2005) highlight issues of validity. For example, Yee (2005) makes the case that there's actually a large amount of inter-correlation among the Big Five factors (except for neuroticism), demonstrating that they are not truly independently measuring discrete parts of our personality. Similar critiques of independence have been made about Bartle's player types, as discussed earlier.

Ethnographic methods have been used extensively in research on virtual worlds and online games (particularly massively multiplayer ones) to understand player experience in socially complex game spaces. Boellstorff, Nardi, Pearce, and Taylor (2012), who have all conducted large-scale ethnographies on player experiences in these kinds of spaces, have written an extensive and thorough guide to online ethnographic methods. Typically, researchers take on the role of participant and observer, taking in and participating in play practices, as well as cultural practices. Analysis is still highly negotiated through the individual researchers' experiences and perspectives, but ethnography, like many rich qualitative methods, can often offer great insights into social interactions, particularly when wanting to understand contexts of play and meaning making, as well as where and how play or learning may be different for different groups of players, due to context or differential experiences.

There are also measures that are considered less subjective, such as those that use eye tracking, galvanic skin response (GSR), functional magnetic resonance imaging (*fMRI*), Electroencephalography (EEG), and facial or body expressions. Some of these seemingly objective measures, however, are still subject to interpretation, and may measure physiological or emotional responses to stimuli, but not necessarily learning outcomes in personal accounts or reflections on experience. Other forms of objective measures can involve implicit response tests, such as the implicit association test, where individuals rapidly respond to stimuli in a way that gets at underlying biases or associations.

Increasingly, scholars have argued for “stealth assessment” (Shute, 2011), or embedded and responsive assessment measures in games, so that games can be tailored for individual needs (e.g., Shute, 2011). For example, a game could vary its difficulty, provide just-in-time help, or offer dynamic feedback. It could also provide the teacher or instructor with feedback to help tailor instruction to students in other ways. Individual tailoring, however, may be complicated by collaborative, cooperative, or other kinds of multi-configurational play or learning. Furthermore, complex kinds of social experiences may be lost on these kinds of quantitative measures. Also increasingly, studies have relied on blending multiple methods to provide both detailed outcome measures (e.g., performance or learning outcomes), along with detailed case studies, interviews, or ethnographies, to give nuance and richness to the findings.

Future Needs

We are still uncovering which factors may derive motivations or pleasures from players, as well as the ways that social interactions and expectations influence and shape play. Researchers are starting to uncover and explore the relationships between large-scale interactions and individual experiences in context to further understand learning outcomes. As we start to learn more about who is playing, how much, and in what ways, especially in the ways that they play, learn and engage as compared to others with different backgrounds, pleasures, motivations and experiences, we will understand further about additional design consideration for addressing diverse players.

Case Study Three: *PlayForward: Elm City Stories* (Written by Sabrina Haskell Culyba)

PlayForward: Elm City Stories is a behavior change game developed in 2012 for Yale University's play2PREVENT lab by Schell Games, in collaboration with Digitalmill. The goal of *PlayForward* is to reduce players' risky behavior, thus reducing their exposure to HIV. It is a single-player, tablet-based game whose target audience includes at-risk young teens. It was designed for initial use in a clinical trial whose participants were located in the New Haven, Connecticut area.

PlayForward engages players with topics of risky behavior, including substance abuse, sex, and social pressure. The gameplay features story scenarios modeled after potential real-life situations, and minigames on developing strategies for navigating peer pressure, evaluating the riskiness of peers, identifying and sharing facts in a social setting, and decision making. The game also promotes future orientation, allowing players to create a profile based on their life aspirations like career, health, and family.

Because the game openly addresses serious and highly personal topics, it was important for the content to feel authentic to players. Early in the project, the play2PREVENT team forged a relationship with an afterschool program in the New Haven area with a representative group of teens from the target demographic. As the Schell Games development team was remote and had little firsthand experience with at-risk teens, the information and artifacts from this representative group were instrumental in shaping the authentic feel of the game. The participants in these activities were generally in the targeted age range of 11-14, though at times slightly younger and older teens were included to get a broader perspective. The information included:

1. In-depth interviews, which probed the teens' perceptions of risky behaviors, as well as their attitudes of the future. This information provided high-level direction on the types of scenarios and themes that would resonate with the demographic.
2. A hands-on "My Life" project, which asked the teens to map out a vision of their next ten years, giving insight into what they did (and did not) already think about in terms of their own future.
3. A open-ended storytelling activity, which prompted the teens to comment on a concept drawing of a crowded party scene. They were asked to describe what they thought was going on with each character, what had happened earlier, and what might happen later. This activity revealed how they evaluated social situations and the kinds of real-world stories they perceived going on around them.
4. A photo feedback project, which provided the teens with disposable cameras and asked them to photograph their life, including their homes, bedrooms, friends, clothes, as well as aspirational items like adult role models, dream homes, and dream cars. These images became guides for character and set designs, and informed the options available in the game for the player's profile.

5. Story review focus tests, which verbally led the teens through the game's stories, asking questions like "Do you know someone this has happened to?" or "What might happen next?" These helped shape the game's narratives to keep them relevant to the target demographic.
6. Line-by-line dialogue reviews prompted the teens to suggest rewrites of dialogue lines to sound more like something they or their friends might say. It became clear that word choice was particularly important for creating an authentic feel for peer pressure or sexual situations.
7. Art reviews of characters and scenes invited the teens to comment on details such as clothing styles and room layouts, to make sure the game's visuals felt familiar to the teens' real world lives.
8. An on-site visit by the development team allowed members of the Schell Games development team to see the New Haven community sites and observe a focus group in person.

Best Practices

Based on the survey of literature, the following design principles should be considered when thinking about the audience:

1. **Consider the learners' ability:** The abilities of learners should always be considered. Effective design for an audience is dependent on the audience's ability (physical and cognitive) to engage with the game.
2. **Consider the player diversity, in backgrounds as well as preferences:** Players have a variety of personalities, learning and emotional preferences. While we cannot address all players' preferences with one game, and research is inconclusive on whether learning styles are applicable, we can structure games that are complex enough to appeal to a variety of pleasures and learning activities.
3. **Allow for the core features of successful games:** Successful games create opportunities for immersion, achievement, interaction and socialization.
4. **Have strong feedback:** Players should have the opportunity for comprehensive and variable feedback that responds to their skill level and ways to improve it.
5. **Allow for responsiveness through design:** Games should tailor to the player's level of experience for optimal learning, and failure should have fair setbacks that require someone to learn from them.
6. **Provide diversity in representation:** Games should feature a variety of characters of different genders, sexualities, races, and ethnicities with varying abilities that are not stereotyped. Research shows that more diversity lowers people's negative stereotypes of others and increases players' own sense of ability.

7. **Create structures so that harmful behavior is minimized:** Harassment should be monitored and enforced in games, whether this is through the developers, educators or community administrators. Studies continue to show that harassment alienates ethnic minorities, females, and LGBT players. This kind of harassment does not just make players distance themselves from gaming, but from the skills and opportunities offered through gaming, like tech-savvy identity building. Also, they are put at significant disadvantage when it comes to learning from games.
8. **Accommodate learning in contexts where the game is played:** When designing for classroom learning, how to accommodate teachers' abilities to play and master the games should be considered, along with how they can monitor and support classroom management.

Resources

Books and Articles

- Bartle, R. (1996). "Hearts, clubs, diamonds, spades: Players who suit MUDs." *Journal of Virtual Environments*, 1(1). Retrieved July 8, 2013 from <http://www.mud.co.uk/richard/hcds.htm>
- Brathwaite, B., & Schreiber, I. (2009). *Challenges for game designers*. Boston, MA: Course Technology/Cengage Learning.
- Fullerton, T. (2008). *Game design workshop: A playcentric approach to creating innovative games*. Burlington, MA: Morgan Kaufman.
- Gee, J.P. (2004). *What video games have to teach us about learning and literacy*. New York: Palgrave.
- Kafai, Y. B., Heeter, C., Denner, J., & Sun, J. Y. (2008). *Beyond Barbie and Mortal Kombat: New perspectives on gender and computer games*. Cambridge, MA: MIT Press.
- Koster, R. (2005). *A theory of fun for game design*. Scottsdale, AZ: Paraglyph Press.
- Lazzaro, N. (2004). *Why we play games: Four keys to more emotion without story* (XEODesign, Inc). White Paper. Retrieved from: http://www.xeodesign.com/xeodesign_whyweplaygames.pdf
- Radoff, J. (2011). *Game on: energize your business with social media games*. Indianapolis: Wiley.
- Richard, G. T. (2013b). "Designing games that foster equity and inclusion: Encouraging equitable social experiences across gender and ethnicity in online games." In G. Christou, E. L. Law, D. Geerts, L. E. Nacke & P. Zaphiris (Eds.) *Proceedings of the CHI'2013 Workshop: Designing and Evaluating Sociability in Online Video Games*. Retrieved from: <http://www.scribd.com/doc/136417975/Proceedings-of-the-CHI-2013-Workshop-on-Designing-and-Evaluating-Sociability-in-Online-Video-Games>
- Richard, G.T. & Hoadley, C.M. (2013). "Investigating a supportive online gaming community as a means of reducing stereotype threat vulnerability across gender." In *Proceedings of Games, Learning & Society 9.0*. ETC Press.
- Ryan, R. M., Rigby, C. S., & Przybylski, A. (2006). "The motivational pull of video games: A self-determination theory approach." *Motivation and emotion*, 30(4), 344-360.
- Schell, J. (2008). *The art of game design: A book of lenses*. Boca Raton, FL: CRC Press.
- Yee, N. (2006). "Motivations for play in online games." *CyberPsychology & Behavior*, 9(6), 772-775.

Games

Dow Day

Jewish Time Jump

Gone Home

References

- Bartle, R. (1996). Hearts, clubs, diamonds, spades: Players who suit MUDs. *Journal of Virtual Environments*, 1(1). Retrieved July 8, 2013 from <http://www.mud.co.uk/richard/hclds.htm>
- Behm-Morawitz, E. & Mastro, D. (2009). The effects of the sexualization of female video game characters on gender stereotyping and female self-concept. *Sex Roles*, 61, 808–823.
- Boellstorff, T., Nardi, B., Pearce, C. & Taylor, T.L. (2012). *Ethnography and virtual worlds: A handbook of method*. Princeton University Press.
- Brathwaite, B., & Schreiber, I. (2009). *Challenges for game designers*. Boston, MA: Course Technology/Cengage Learning.
- Brink, K., Fowers, T., Long, T., Bura, S., Hiwiller, Z. & Vandenberghe, J. (2013). *Group report: Psychology for game designers* (Fat Labs, Inc.). White Paper. Retrieved from: http://www.projecthorseshoe.com/reports/ph13/Project_Horseshoe_2013_report_section_8.pdf
- Callois, R. (2001). *Man, play and games*. University of Illinois Press. (Original work published in 1961).
- Caperton, I. H. (2012). *Learning to make games for impact: Cultivating innovative manufacturing skills for the digital economy*. Retrieved from: <http://gamesandimpact.org/wp-content/uploads/2012/09/Idit-WhitehouseConv-Feb2012-1.pdf><http://gamesandimpact.org/wp-content/uploads/2012/09/Idit-WhitehouseConv-Feb2012-1.pdf>
- Connolly, T. M., Boyle, E. A., MacArthur, E., Hainey, T., & Boyle, J. (2012). A systematic literature review of empirical evidence on computer games and serious games. *Computers & Education*, 59(2): 661–686.
- Dill, K. E., & Burgess, M. C. (2013). Influence of Black Masculinity Game Exemplars on Social Judgments. *Simulation & Gaming*, 44(4), 562-585.
- DiSalvo, B. & Bruckman, A. (2010). Race and gender in play practices: young African American males. In *Proceedings of the Fifth International Conference on the Foundations of Digital Games* (pp. 56-63). ACM Press.
- Gee, J.P. (2004). *What video games have to teach us about learning and literacy*. New York: Palgrave.
- Gray, K. L. (2012). Intersecting oppressions and online communities: Examining the experiences of women of color in Xbox Live. *Information, Communication & Society*, 15(3), 411-428.
- Feng, J., Spence, I., & Pratt, J. (2007). Playing an action video game reduces gender differences in spatial cognition. *Psychological Science*, 18(10): 850-855.
- Jensen, J. & de Castell, S. (2011). Girls@Play: An ethnographic study of gender and digital gameplay. *Feminist Media Studies*, 11(2), 167-179.
- Fullerton, T. (2008). *Game design workshop: A playcentric approach to creating innovative games*. Burlington, MA: Morgan Kaufman.
- Kafai, Y. B., Cook, M. S., & Fields, D. A. (2010). Blacks deserve bodies too!: Design and discussion about diversity and race in a tween virtual world. *Games and Culture*, 5(1), 43-63.
- Koster, R. (2005). *A theory of fun for game design*. Scottsdale, AZ: Paraglyph Press.
- Kuznekoff, J. H., & Rose, L. M. (2013). Communication in multiplayer gaming: Examining player responses to gender cues. *New Media & Society*, 15(4), 541-556.
- Lazzaro, N. (2004). *Why we play games: Four keys to more emotion without story* (XEODesign, Inc). White Paper. Retrieved from: http://www.xeodesign.com/xeodesign_whyweplaygames.pdf

- Lazzaro, N. (2008). Are boy games even necessary? In Y.B. Kafai, C. Heeter, J. Denner & J.Y. Sun (Eds.) *Beyond Barbie and Mortal Kombat: New perspectives on gender and gaming* (pp. 198-215). Cambridge, MA: MIT Press.
- Lee, J. R. & Park, S. G. (2011) Whose *Second Life* is this? How avatar-based racial cues shape ethno-racial minorities' perception of virtual worlds. *Cyberpsychology, Behavior & Social Networking*, 14(11): 637-642.
- Mathews, J. M., & Squire, K. D. (2010). Augmented reality gaming and game design as a new literacy practice. In *Media Literacy: New Agendas in Communication* (pp. 209-232). University of Texas at Austin: Routledge
- McClarty, K. L., Orr, A., Frey, P. M., Dolan, R. P., Vassileva, V., & McVay, A. (2012). *A Literature Review of Gaming in Education* (Research Report), Upper Saddle River, New Jersey: Pearson.
- Miller, M. K., & Summers, A. (2007). Gender differences in video game characters' roles, appearances, and attire as portrayed in video game magazines. *Sex roles*, 57(9-10), 733-742.
- Pashler, H., McDaniel, M., Rohrer, D. & Bjork, R. (2008). Learning styles concepts and evidence. *Psychological science in the public interest*, 9(3), 105-119.
- Plass, J. L., Homer, B. D., Kinzer, C., Frye, J., & Perlin, K. (2011). *Learning mechanics and assessment mechanics for games for learning* (Games 4 Learning Institute, New York University). White Paper. Retrieved from: <http://steinhardtapps.es.its.nyu.edu/create/classes/2505/reading/Plass%20et%20al%20LAMEchanics%202505.pdf>
- Radoff, J. (2011). *Game on: Energize your business with social media games*. Indianapolis: Wiley.
- Richard, G.T. (2013a). Gender and game play: Research and future directions. In B. Bigl & S. Stoppe (Eds.): *Playing with Virtuality, Theories and Methods of Computer Game Studies*, Frankfurt: Peter Lang.
- Richard, G. T. (2013b). Designing games that foster equity and inclusion: Encouraging equitable social experiences across gender and ethnicity in online games. In G. Christou, E. L. Law, D. Geerts, L. E. Nacke & P. Zaphiris (Eds.) *Proceedings of the CHI'2013 Workshop: Designing and Evaluating Sociability in Online Video Games*. Retrieved from: <http://www.scribd.com/doc/136417975/Proceedings-of-the-CHI-2013-Workshop-on-Designing-and-Evaluating-Sociability-in-Online-Video-Games>
- Richard, G.T. (2013c, Aug). The interplay between gender and ethnic harassment in game culture and its implications for play and learning. Paper presented at *the 6th Digital Games Research Association (DiGRA) Conference: Defragging Game Studies*. Georgia Institute of Technology, Atlanta, GA, USA.
- Richard, G. T. (2013d). *Understanding gender, context and video game culture for the development of equitable digital games and learning environments* (Doctoral Dissertation). New York University, New York, NY, USA.
- Richard, G.T. & Hoadley, C.M. (2013). Investigating a supportive online gaming community as a means of reducing stereotype threat vulnerability across gender. In *Proceedings of Games, Learning & Society 9.0*. ETC Press.
- Rigby, S. & Ryan, R.M. (2007). *The player experience of need satisfaction (PENS): An applied model and methodology for understanding key components of the player experience* (Immersyve, Inc). White Paper. Retrieved from: http://www.immersyve.com/downloads/research-and-white-papers/PENS_Sept07.pdf
- Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American psychologist*, 55(1), 68-78.
- Ryan, R. M., Rigby, C. S., & Przybylski, A. (2006). The motivational pull of video games: A self-determination theory approach. *Motivation and emotion*, 30(4), 344-360.
- Salen, K. & Zimmerman, E. (2003). *Rules of play: Game design fundamentals*. Cambridge, MA: MIT Press.
- Schell, J. (2008). *The art of game design: A book of lenses*. Boca Raton, FL: CRC Press.
- Shaw, A. (2012a). Talking to gaymers: Questioning identity, community and media representation. *Westminster Papers*, 9 (1): 67-89.

- Shaw, A. (2012b). Do you identify as a gamer? Gender, race, sexuality and gamer identity. *New Media & Society*, 14(1), 28-44.
- Shute, V. J. (2011). Stealth assessment in computer-based games to support learning. *Computer games and instruction*, 55(2), 503-524.
- Shute, V. J., & Ke, F. (2012). Games, learning, and assessment. In D. Ifenthaler, D. Eseryel & X. Ge (Eds.), *Assessment in Game-Based Learning* (pp. 43-58). New York: Springer.
- Squire, K. (2011). Video games and learning: *Teaching and participatory culture in the digital age*. New York: Teachers College Press.
- Sunden, J. & Sveningsson, M. (2012). *Gender and sexuality in online game cultures*. New York, NY: Routledge.
- Vermeulen, L., Loy, J.V., De Grove, F. & Courtois, C. (2011). You are what you play? A quantitative study into game design preferences across gender and their interaction with gaming habits. In *Proceedings of the 5th International Digital Games Research Association Conference*. DiGRA.
- Wouters, P., van Nimwegen, C., van Oostendorp, H., & van der Spek, E. D. (2013). A meta-analysis of the cognitive and motivational effects of serious games. *Journal of Educational Psychology*, 105(2), 249.
- Vandenberghe, J. (2012, March). The 5 domains of play. Paper presented at the *Game Developers Conference 2012*. San Francisco, CA, USA. Retrieved from: <http://www.darklorde.com/2012/03/the-5-domains-of-play-slides/>
- Yee, N. (2005, March). Hidden agenda: What do personality trait assessments really assess [web log post]. Retrieved from <http://www.nickyee.com/ponder/big5.html>
- Yee, N. (2006). Motivations for play in online games. *CyberPsychology & Behavior*, 9(6), 772-775.
- Yee, N. (2008). Maps of digital desires: Exploring the topography of gender and play in online games. In Y. B. Kafai, C. Heeter, J. Denner & J.Y. Sun (Eds.) *Beyond Barbie and Mortal Kombat: Perspectives on Gender and Gaming* (pp. 83-96). Cambridge, MA: MIT Press.
- Young, M. F., Slota, S., Cutter, A. B., Jalette, G., Mullin, G., Lai, B., Simeoni, Z., Tran, M. & Yukhymenko, M. (2012). Our princess is in another castle: A review of trends in serious gaming for education. *Review of Educational Research*, 82(1), 61-89.