

Empirical Game Design for Explorers

John M. Quick

Division of Educational Leadership and Innovation

Mary Lou Fulton Teachers College

Arizona State University

John.M.Quick@asu.edu

Robert K. Atkinson

The School of Computing, Informatics, and Decision Systems Engineering

Ira A Fulton Schools of Engineering

Arizona State University

Robert.Atkinson@asu.edu

Abstract

The explorer player type has remained a focal point in discussions of game design and research for several years. Though valuable insights have built an understanding of explorers from online multiplayer and individual characteristic perspectives, there still remains a need to further understand and empirically specify what aspects of games are appealing to explorers. Accordingly, the Gameplay Enjoyment Model (GEM; Quick, Atkinson, & Lin, 2012b) provides a detailed, empirical perspective on the explorer through a set of specific game design features. Using these features, games can be designed to leverage what is known about how explorers experience enjoyment through games. A practical demonstration of how to design Exploration features into a game is offered through an analysis of *Pathfinders Way*. This article aims to encourage a deeper understanding of explorers and provide practical guidance on how empirical research results can be incorporated into game design practice.

Keywords: game design, player types, explorers, enjoyment, individual differences

Empirical Game Design for Explorers

The purpose of this paper is to discuss how games can be empirically and practically designed to meet the enjoyment needs of explorers. The explorer player type will be introduced through both historical perspectives and recent research. Subsequently, the Gameplay Enjoyment Model (GEM; Quick, et al., 2012b), which empirically models the enjoyment that players derive from gameplay through a set of 28 design features, will be introduced. Exploration is one of seven key components of GEM that can be used to design games to match the individual preferences of players. A practical demonstration of how to design Exploration into a game will be offered. This will consist of an analysis of *Pathfinders Way*, an iOS game, to demonstrate how empirically-derived Exploration features can be mapped directly to actual game mechanics. This paper aims to provide insights on the explorer player type and practical knowledge on how to leverage empirical research results to design games to meet the enjoyment needs of specific players.

Explorers in the Literature

The examination of explorers has remained relevant for several years in the literature. Explorers and their associated characteristics have appeared in many design discussions, including those focused on entertainment (Bartle, 1996; Hunicke, LeBlanc, & Zubek, 2004; Klug & Schell, 2006; Yee, 2006; Yee, Ducheneaut, & Nelson, 2012) and serious games (Heeter, 2008; Heeter, Lee, Medler, & Magerko, 2011; Magerko, Heeter, & Medler, 2010; Quick, Atkinson, & Lin, 2012a; Wilson et al., 2009; Winn, 2008). In his classic examination of multi-user dungeon (MUD) players, Bartle (1996) described the explorer as one who interacts primarily with the game world rather than other players,

seeks surprises, and tries to learn as much as possible about a game's details.

Subsequently, Bartle's (1996) explorer was incorporated into examinations of player motivations in massively multiplayer online roleplaying games (MMORPGs; Yee, 2006; Yee, et al., 2012). Specifically, Yee's (2006) and Yee et al.'s (2012) findings suggest that explorers are interested in knowing things about the game world, examining the geography of the game world, and discovering hidden things.

In a departure from the classical, online multiplayer perspective, recent approaches have focused towards individualized preferences across a variety of games. For instance, Magerko et al. (2010) identified specific game mechanics that could be added or removed from an educational biology game to adapt its gameplay to different player types. Here, the authors conceptualized explorers as those who favor additional tools or modes for learning about game content and who are averse to time constraints. Furthermore, Heeter et al. (2011, p. 4) differentiated player preferences based on goal orientation and defined exploration using unique terms like "exploration without competition,... to explore the game world beyond what is necessary to win... realistic details about people and places... and... sticking with familiar games." Meanwhile, Quick et al. (2012a) formed a taxonomy based on players' personality traits and their preferences for game features. In this study, exploration represented "the enjoyment of searching for hidden things, collecting things, and exploring unfamiliar places" (Quick, et al., 2012a, p. 20). Ultimately, the authors of all three examinations (Heeter, et al., 2011; Magerko, et al., 2010; Quick, et al., 2012a) agreed that further research was necessary to refine the specific features that explain the enjoyment of exploration in games. While preceding works have provided many valuable insights into explorers, none have

delivered sufficient empirical evidence and specificity to define the enjoyment that explorers experience during gameplay.

The Refined Empirical Explorer

The Gameplay Enjoyment Model (GEM; Quick, et al., 2012b) addresses the need for a specific, empirical representation of gameplay enjoyment. GEM is composed of 28 game features that relate to players' overall Enjoyment of games, as well as six dimensions of enjoyment, which include Challenge, Companionship, Competition, Exploration, Fantasy, and Fidelity. This model has been refined through a series of empirical iterations (Quick & Atkinson, 2011; Quick, et al., 2012a, 2012b; Quick, Atkinson, & Lin, in press). Within GEM, the Exploration dimension is of particular interest to this discussion.

The Exploration dimension of GEM is composed of five game design features that influence player enjoyment (Quick, et al., 2012b).

- Searching for hidden things
- Discovering unexpected things
- Exploring unfamiliar places
- Experimenting with different play strategies
- Exploring the inner workings of a game

From these features, Exploration can be defined as "the enjoyment of games that involve searching for hidden things, discovering unexpected things, exploring unfamiliar places, experimenting with different play strategies, and exploring the inner workings of a game" (Quick, et al., 2012b, p. 15). Accordingly, an explorer can be considered a player who derives enjoyment from these Exploration features.

Exploration in *Pathfinders Way*

With a concrete, empirical definition of explorers in hand, the practical design of exploration into games should be considered. To demonstrate the applicability of the GEM's Exploration features, the design of an actual game that incorporates these features will be discussed.

Pathfinders Way is an iOS game that was first released for the iPad in August 2012. In *Pathfinders Way*, the player takes on the role of a pathfinder who is exploring and mapping unknown lands. At the start of each level, the player is placed randomly on a 6x6 map grid (36 squares) with unknown terrain and a known destination. As the player explores the unknown territory, a map is gradually drawn that specifies the terrain of lands as well as various hidden objects scattered throughout. The player also collects artifacts along the way. Figure 1 depicts the progression of an example level from the *Pathfinders Way* prototype.



Figure 1. An example level from the *Pathfinders Way* prototype. **Left panel:** The player begins the level with a known destination (green flag) and unexplored map. The player can see and move one space at a time up, down, left, or right. **Middle panel:** The player begins exploring the map terrain (plains, water, and mountains) and encounters a hidden bonus object (a boat, symbolized by the anchor). **Right panel:** The player continues exploring the map and heading towards the destination. As shown, the player uses the boat whenever on water terrain, which aids in the collection of artifacts.

The five features of GEM Exploration were directly mapped to mechanics in *Pathfinders Way* with the intent of creating an enjoyable experience for explorers. First, the player's desire to search for hidden things is supported by hidden terrain and hidden objects placed in each map. When a level begins, only the player's own square and the destination are revealed on the map. Hence, the player must reveal the unknown terrain and explore to locate hidden objects. These activities support the player's enjoyment of searching for hidden things.

Second, the player's enjoyment of discovering unexpected things is reinforced through the inclusion of bonus objects. These are randomly placed in unknown locations on each level map. The bonus objects include a horse, boat, climbing gear, and caches of artifacts. These bonuses augment the player's ability to collect artifacts once found and are accordingly desirable to encounter. Thus, the player should be delighted when a bonus is discovered, especially because they can come as an unexpected surprise.

Third, the player's need to explore unfamiliar places is met by the random generation of each level map. The player, destination, terrain, and all objects are randomly placed at the start of each level. Of these, the player and destination are revealed, while the terrain and objects are hidden. A core mechanic of the game is exploring the unfamiliar landscape to reveal its terrain and find hidden objects. Since each level map is randomly generated and contains hidden information, the player is continually exploring unfamiliar places.

Fourth, the player's ability to experiment with different strategies is afforded through goal freedom. Each level, a player is given a specific destination to reach on the map, but may choose any route or strategy for getting there. *Pathfinders Way* does not

prioritize one strategy over another, such as revealing the most map squares or collecting the most artifacts. The player does collect artifacts, which can be enhanced through bonuses, while exploring the map. However, the player is simultaneously building a *Pathfinders Purpose*, which presents information about the player's motivations for play. It starts by recording certain gameplay data, such as the number of map spaces explored and artifacts collected. In addition, it captures the lands disturbed by the player. That is, each time a player explores an unknown map square, the land becomes disturbed by human intervention. All together, this record of gameplay actions is used to present the player with information about his or her own style of play. For example, a player with a conservationist mentality might reach the destination as quickly as possible to disturb the fewest lands, while a player with a materialist mindset might try to obtain the most artifacts, whereas a player with a completionist approach might explore the entire map regardless of any other considerations. Since no strategy is prioritized, the emergence of strategies that reflect the player's personal motivations is facilitated.

Fifth, the player is encouraged to explore the inner workings of the game through artifact collecting and the *Pathfinders Purpose*. To reiterate, the player collects artifacts by exploring an unfamiliar map and can obtain even more artifacts through the discovery of hidden bonus objects. Furthermore, the player is presented with a dilemma whereby more exploration leads to more treasures, but also to greater deterioration of the natural landscape. As described, the player's actions are also recorded and presented in the *Pathfinders Purpose*. Hence, the player is inspired to examine the balance at play and the multifaceted impacts that certain actions have on the game world. The player's approach

to *Pathfinders Way* will vary depending on an understanding of the underlying game system as well as personal motivations for play.

By designing the five features of Exploration directly into *Pathfinders Way*, it is anticipated that the enjoyment experienced by explorers will be enhanced. Table 1 summarizes how the Exploration features were mapped to the design of *Pathfinders Way*.

Table 1
Mapping of Exploration Features to Pathfinders Way Features

Exploration Features	Game ^a Features	Description
Searching for hidden things	Hidden terrain Hidden objects	All terrain and objects are hidden from at the start of a level and are revealed by the player.
Discovering unexpected things	Bonus objects	Bonus objects, which augment the player's ability to collect artifacts, are randomly placed at the start of each level.
Exploring unfamiliar places	Random map Hidden terrain Hidden objects	The map for each level is randomly generated and all terrain and objects are hidden from the player at the start.
Experimenting with different play strategies	Goal freedom Artifact collection Bonus objects Pathfinders Purpose	The player has a destination to reach, but can choose any route or strategy to get there. The player collects artifacts while exploring, which are augmented by hidden bonus objects. Gameplay data are used to present the player with information about his or her own preferences among conflicting strategies.
Exploring the inner workings of a game	Artifact collection Bonus objects Pathfinders Purpose	The player collects artifacts while exploring, which are augmented by hidden bonus objects. Gameplay data are used to present the player with information about his or her own preferences among conflicting strategies.

^aGame refers specifically to *Pathfinders Way*

Conclusion

The explorer remains a player type of great interest to the design and research of games. Multiple views of the explorer have been discussed. A refined perspective of the explorer, derived from empirical research on the Gameplay Enjoyment Model (GEM), has been offered. A practical example of how to use the GEM Exploration features to design a game for explorers has been presented through an analysis of *Pathfinders Way*. In addition to encouraging a deeper appreciation of explorers, it is hoped that this discussion has provided a practical understanding of how GEM can be used to design games that value the unique needs of players.

References

- Bartle, R. (1996). *Hearts, clubs, diamonds, spades: Players who suit muds*. MUSE Ltd. United Kingdom. Retrieved from <http://www.mud.co.uk/richard/hcds.htm>
- Heeter, C. (2008). Play styles and learning. In R. Ferdig (Ed.), *Handbook of research on effective electronic gaming in education* (pp. 826-46). Hershey, PA: IGI Global.
- Heeter, C., Lee, Y.-H., Medler, B., & Magerko, B. (2011). *Beyond player types: Gaming achievement goal*. Paper presented at the ACM SIGGRAPH 2011 Game Papers.
- Hunicke, R., LeBlanc, M., & Zubek, R. (2004). *Mda: A formal approach to game design and game research*. Paper presented at the Proceedings of the AAAI-04 Workshop on Challenges in Game AI.
- Klug, G. C., & Schell, J. (2006). Why people play games: An industry perspective. In P. Vorderer & J. Bryant (Eds.), *Playing video games: Motives, responses, and consequences*. New York, NY: Routledge.
- Magerko, B., Heeter, C., & Medler, B. (2010). Different strokes for different folks: Tapping into the hidden potential of serious games. In R. Van Eck (Ed.), *Gaming and cognition: Theories and perspectives from the learning sciences* (pp. 255-80). Hershey, PA: IGI Global.
- Quick, J. M., & Atkinson, R. K. (2011). A data-driven taxonomy of undergraduate student video game enjoyment. In C. Steinkuehler, C. Martin & A. Ochsner (Eds.), *Proceedings gls 7.0 games + learning + society conference* (pp. 185-90). Pittsburg, PA: ETC Press.
- Quick, J. M., Atkinson, R. K., & Lin, L. (2012a). Empirical taxonomies of gameplay enjoyment: Personality and video game preference. *International Journal of Game-Based Learning*, 2(3), 11-31.
- Quick, J. M., Atkinson, R. K., & Lin, L. (2012b). The gameplay enjoyment model. *Manuscript submitted for publication*.
- Quick, J. M., Atkinson, R. K., & Lin, L. (in press). Confirming the taxonomy of video game enjoyment. In A. Ochsner (Ed.), *Proceedings gls 8.0 games + learning + society conference*. Pittsburg, PA: ETC Press.
- Wilson, K. A., Bedwell, W. L., Lazzara, E. H., Salas, E., Burke, C. S., Estock, J. L., . . . Conkey, C. (2009). Relationships between game attributes and learning outcomes: Review and research proposals. *Simulation & Gaming*, 40(2), 217-66. doi: 10.1177/1046878108321866
- Winn, B. (2008). The design, play, and experience framework. In R. Ferdig (Ed.), *Handbook of research on effective electronic gaming in education* (pp. 1010-24). Hershey, PA: IGI Global.
- Yee, N. (2006). Motivations for play in online games. *CyberPsychology & Behavior*, 9(6), 772-5.
- Yee, N., Ducheneaut, N., & Nelson, L. (2012). Online gaming motivations scale: Development and validation. *Proceedings of the 2012 acm annual conference on human factors in computing systems* (pp. 2803-6). Austin, TX: ACM.