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A Game Plan for Academics

DANIEL IRETON, JOELLE PITTS, AND BEN WARD

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Library Discovery through Augmented Reality: A Game Plan for Academics

Daniel Ireton, Kansas State University, U.S.A.
Joelle Pitts, Kansas State University, U.S.A.
Ben Ward, Kansas State University, U.S.A.

Abstract: In order to create innovative pathways to services and resources, the authors propose placing a "game-layer" on top of the library, luring new patrons with the potential of playing an Alternate/Augmented Reality Game (ARG). Using both physical and virtual library space a variety of "nodes" are created, drawing players to various library locales even regular patrons may be unfamiliar with and presenting them with story fragments and puzzles. Each node requires players to use library resources like databases and books, or engage library staff at known service points in order to move forward. Players contribute to the game itself in the form of puzzle solutions. Far more illustrative than a guided tour or required course/class, this library ARG encourages players to discover and utilize resources within the context of the game, generating fluency in library systems, places and platforms. But more importantly, the ARG invites a process of "meta-level reflection" invaluable throughout a patron's academic career.

Keywords: Augmented Reality Games, Alternate Reality Games, Libraries

Academic libraries in North America offer a plethora of services and resources to undergraduate students, graduate students, faculty, and in many cases the surrounding community. These services go far beyond the traditional practices of collecting and lending print books. Libraries today often offer more electronic than print resources, in the form of subscription databases and e-book packages. They offer bibliographic instruction sessions to teach patrons how to find the most relevant research for their topic. They answer research questions on demand and online, and provide copyright consultation services. Many libraries even create digital tutorials and videos to help patrons navigate the wealth of information at their fingertips. Sadly, however, most students, faculty and staff are unaware of all that their campus library offers; that the library is the academic heart of university. As libraries fight to prove their relevance to their campus communities, innovative approaches to promotion and marketing must be utilized. This article describes one library's attempt to utilize gaming and game structure to positively increase students' attitudes and interactions with the library and its staff.

During the fall semester of 2012 the authors carried out a plan over a year in the making to draw individuals into the physical and digital spaces of their academic library. Through a combination of library knowledge, instructional design, and a wholehearted love of gaming, the authors crafted a path through which student players would traverse and grow acquainted with various library resources. The aim of this educational gaming experiment was twofold: expose students to library resources and foster in them an emotional affinity for the heart of the university.

Employing a game to teach might at first seem a frivolous pursuit for three professionals at a state university. Aside from a love of gaming, a growing volume of research points to games' efficacy in teaching and learning. According to the 2012 Horizon Report, a collaborative annual report by EDUCAUSE, game-based learning is two to three years from mainstream adoption across higher education in North America:

> Game-based learning reflects a number of important skills higher education institutions strive for their students to acquire: collaboration, problem solving, communication, critical thinking, and digital literacy. What makes educational gaming appealing today is the plethora of genres and applications associated with it (19).

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Theoretical Framework

According to the 2013 Horizon Report, "game play has traversed the realm of recreation and has infiltrated the worlds of commerce, productivity, and education, proving to be a useful training and motivation too (21)." And research indicates the "gamer culture is growing to include a substantial sector of the world's population with the age of the average gamer lowering each passing year (20)." Certainly, the authors feel that the integration of games and gaming into higher education is one way to provide simulated training and motivation for the ever increasing number of gamers arriving on college campuses each year.

Games serve as an excellent pedagogical model for a scaffolded approach to learning. In games, players must complete a set of skills before they are capable of moving to the next set (largely expressed in video games as "levels") ensuring that they cannot be left behind or lost or in over their heads. Games are also a safe space for a learner to fail. Unlike traditional assignments, risk-taking is encouraged by the way games enable iteration. A wrong step on an assignment might lead to a negatively impacted overall grade, leading students to intensely fear failure and quash the impulse to experiment within a class's context. Because failure is so low-cost in games, players are much more inclined to try unorthodox approaches. Transferred to the classroom this leads to increased critical thinking and experimentation among students.

Literature Review

Games-based learning research has been slowly growing over the last three decades. For example, a review of the early literature uncovered that researchers found positive correlations between game-based tactics and engagement and retention of knowledge. "The positive results obtained for retention over time favors the use of simulations/games. Because games require the active participation of students, the material has a greater chance of being integrated into the cognitive structures of the individuals and thus being retained." And, "[t]hat game/simulations are more interesting than traditional classroom instruction is both a basis for using them as well as a consistent finding. The greater interest in games holds true even when controls for initial novelty (Hawthorne Effect) have been used." (Randel, Morris, Wetzel, & Whitehill 1992, 270). But, according to Dr. Sara de Freitas, Director of Research at the Serious Games Institute, over the last several decades there remains "...a dominant perception of gaming as a leisure pursuit with no pedagogical value". However, as stated in her 2006 report, "Learning in Immersive Worlds: A review of game-based learning," that perception is changing as greater numbers of educators are connecting the cognitive benefits of game mechanics and environments with formal educational training and objectives. "Beyond their value as entertainment media, games and game modification are currently key entry points for many young people into digital literacy, social communities, and tech-savvy identities" (Salen, 207). Not surprisingly, more and more educators are experimenting and publishing on the effects of game-based learning in their classrooms. The vast majority report increased motivation, engagement, and collaboration among their students, furthering the rapid growth of the 'Serious Games' and gamification movements.

School is in many ways like a full time job for students, with all the negative implications of that situation. Students love to learn, but they may view school as a chore. Game environments can provide an entry point into the real 'work' of obtaining a degree, and gaining real world skills. In "Education Unleashed," Cory Ondrejka (2008) writes of working with *Second Life*:

In the past year alone, sixty-five companies employing a total of over 220 people started with *Second Life* before moving into the real world. This group of innovators is leveraging education every day and building skills that also apply to the real world....What are the implications of this changing approach to work, where the most capable and effective people may not classify their activities as work at all? Instead they may describe how they spend their time as "play" or "fun (230)."

If real work can be done, and done well, in a game environment where players view "work" as "play," the same can apply to learning - changing "schoolwork" into "school-play."

Game-based learning also encourages peer-to-peer collaboration, and may be one way for educators to overcome student loathing of "group work" in which many students feel either that they are doing all of the work while the credit is shared, or perceive that they can ride the coattails of other, more industrious students. Shaffer, Squire, Halverson, and Gee (2005) go further and state that one benefit of games-based learning is that players are immersed in communities of practice (107). Often in Alternate Reality Games, the game community remains active far beyond the conclusion of the game, a trend the authors believe can be applied to academic settings as well.

Learning in a game environment works effectively in large part to the safety and agency players feel while playing games. Accomplished game developer Dr. Jane McGonigal states in a 2010 TED Talk that:

> …when we're in game worlds I believe that many of us become the best version of ourselves, the most likely to help at a moment's notice, the most likely to stick with a problem as long it takes, to get up after failure and try again. And in real life, when we face failure, when we confront obstacles, we often don't feel that way. We feel overcome, we feel overwhelmed, we feel anxious, maybe depressed, frustrated or cynical. We never have those feelings when we're playing games, they just don't exist in games.

If this most inspiring component of the player experience, the willingness to iterate, or fail and try again, can be harnessed for education, we will start to see the kind of deep learning and critical thinking so sought after by the Academy. From *The Ecology of Games* James Paul Gee (2008) writes in "Learning and Games":

> One key feature [in games] is the role of failure. In good games, the price of failure is lowered....Furthermore, failure...is often seen as a way to learn the underlying pattern and eventually to win. These features of failure in games allow players to take risks and try out hypotheses that might be too costly in places where the cost of failure is higher or where no learning stems from failure (p. 34).

Again, from the 2013 Horizon Report, "in the context of higher education, when students are expected to think critically in order to solve problems, game-like simulations can be leveraged in any discipline to reinforce the real world applications of concepts (21)."

Research Question

Games are a safe space for learning, and players are highly motivated to learn. Wishing to tap into this motivation, and with incoming student populations increasingly comprised of gamers, the researchers wished to create a low-impact "test game." It followed for the researchers that a game-based learning environment would be an effective tool in motivating students to use the library. Could they positively affect student's attitudes toward the library by associating it with a series of fun and whimsical challenges centered there? This question was central to the development of the project.

Understanding Alternate Reality Games

Assured of the legitimacy of using games in an academic setting, the question arose of how best to use them. After some discussion, the authors settled on and began developing an Alternate Reality Game (ARG). Explaining an ARG to one unfamiliar with the concept presents some

unique challenges. Jane McGonigal (2004) offers the following definition in *Alternate Reality Gaming*:

> An ARG is an interactive drama played out online and in real-world spaces, taking place over several weeks or months, in which dozens, hundreds, or thousands of players come together online, form collaborative social networks, and work together to solve a mystery or problem (8).

While useful, this definition is still quite limited; ARG structure and purpose is better understood by example. ARGs typically unfold in real time frequently over the course of several weeks, and often lose much of their efficacy once this time has passed. Fortunately for game and story archeologists, much of a game's online presence continues to exist after the fact and such digital artifacts can be used as illustrative examples of ARGs. The structure of a well-known ARG, "I Love Bees," is still virtually intact at http://www.ilovebees.com/. This innocuous seeming website very effectively pulled over 600,000 players into a game world that overlapped with the real world – persistent players followed clues and coordinated globally to solve puzzles that would have been impossible for the individual. Writing about the game in 2007, Jane McGonigal points out how ARGs and "I Love Bees" in particular differ from traditional games:

> The I Love Bees game did not articulate a specific goal, a win condition, rules…. Nor did it offer any obvious choices to make, or sequences of buttons to press, or virtual objects to collect. Instead, the players had only a call to action, a very complex data set, a few seemingly random threads of story—and the freedom to respond to them however they wanted (8).

While taking place in the real world, the structure of an ARG allows for players to become part of a narrative that is clearly outside what might be called their "standard reality," hence "alternate reality" or occasionally "augmented reality" gaming. Seth Priebatsch refers to this overlay of gaming narrative and real-world place in a 2010 TED Talk as the "game layer on top of the world." This game layer is already being used successfully in education as Priebatsch points out:

> So school is a game, and there have been lots of experimentations on how we do this properly. But let's use it consciously. Like why have games that you can lose? Why go from an A to an F or a B to a C? That sucks. Why not level-up? And at Princeton, they've actually experimented with this, where they have quizzes where you gain experience points, and you level up from B to an A. And it's very powerful. It can be used in interesting ways.

The Lost Book Methodology

Having a goal and some narrative structure in mind, the authors began to develop their ARG for Kansas State University Libraries (KSUL). Though they started with a research framework in mind (can we positively influence player attitudes towards the library), the project deviated somewhat from more traditional research models. Their aim was to create a pilot game to gauge interest in ARGs in a library setting and establish a baseline for scaling up both the game and an in-depth research process for how game-based learning influences critical use of library space. As this was a pilot project and an experimental approach, pre and post-measurements were uncollectable, limiting the depth of our conclusions.

Narrative

The game centered on the "Lost Book," a book which the game's narrator needed help in locating. A number of core elements emerged during the design process. Game narratives vary wildly, but a tradition of dark, conspiratorial narratives has endured across video, table top and alternate reality games for decades. These narratives sometimes create barriers to entry for new or sensitive gamers. The authors first priority while writing the narrative for the KSUL ARG was to create a light, safe, whimsical atmosphere, in order to appeal to a wider audience, and maintain an environment reflective of the library itself.

These requirements in mind, a narrative developed around two students, a brother and sister, who grew up solving puzzles, cyphers, and mysteries together. The narrator, known clandestinely as "H," (also an important mechanic) taunts his sister via his website with a mysterious lost book. The narrative, loaded with various hidden wordplay clues and cyphers, entreated those others (the players) who found the site to help him and his sister find the book. From the website's introduction, the narrator writes:

I tell her about a book I lost. Well, not really lost, more like forgot. In fact I am not really sure it was a book at all, but rather the memory of a story. I remember clearly reading this story that for some reason I never got to finish (https://sites.google.com/site/findthelostbook/home/day-1).

As players progressed through the game, more snippets of the story were revealed through the website, creating a collective story representative of the various paths players were tasked to follow.

Entry Points

In order to discover the site, potential players required a "rabbit hole" leading them to find it. Seeded across campus were a number of tear-tab flyers, sidewalk chalking, and business cards. The site was also alluded to via KSUL's twitter account and through a classified ad in the student newspaper.

Path

Most games require a linear or semi-linear path for players to follow, manifesting in various ways. From video game levels to a Monopoly board, players understand that they are moving towards a goal or action. "The Lost Book" was no different – players enticed by the website's narrative were driven throughout KSUL's central library, Hale. An architecturally impressive five story building with many hidden nooks and crannies, Hale houses the majority of KSUL's physical holdings and many specialized service points.

Players were encouraged via the website narrative to ask for help at Hale Library Help, KSUL's central reference and circulation hub. Inquiry about the Lost Book led to a series of call numbers scattered throughout four main floors, six stack levels, and various physical media, each with a visible calling card containing an identifying marker and a couplet from the poem *Riddle on the Letter H*, (recalling the name of the narrator). The poem has historically been attributed to both Catherine Fanshawe and Lord Byron, and players were asked to research the source of the poem once they collected all of the couplets, and report their "vote" for the real author. These calling cards also contained additional clues pointing players towards Hale Library Reserves, another of KSUL's important services for students and faculty, and Special Collections and Archives, a relatively unknown service point for most undergraduate students.

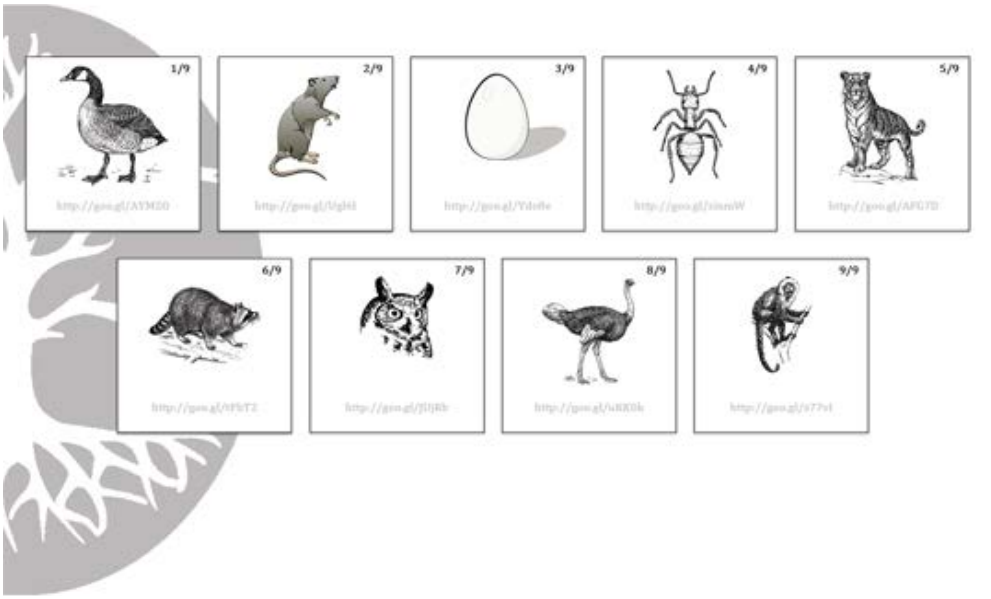
Players desiring more online clues and amusing "Easter eggs" (intentionally hidden content) could access a guide to the Lost Book built using LibGuides, a popular library resource platform at http://guides.lib.k-state.edu/content.php?pid=357277.

Puzzles

Traditionally, **p**uzzles have been an **inte**gral pa**r**t of alt**e**rnate reality game**s** since **t**heir in**c**epti**o**n. Puzzles provide a challenge for participants. In addition, puzzles, depending upon their design, can be used to create opportunities for co**m**munal dis**c**overy, enr**i**chment of narratives, and even control over **p**rogress t**h**rough the gam**e** play as a fo**r**m or gateway or milestone. However, **c**aution should b**e** used when implementing puzzles within ARGs, bec**a**us**e** the **a**ppeal of puzzle solving **r**ealistically has a limited and specific audience.

Nonetheless, puzzles add depth for the overall experience. Within the context of the game, the puzzles allowed participants the opportunity to discover the answers to specific challenges earlier in the gameplay than those of players purely following the narrative. In addition, clues to finding solutions for the puzzles were embedded within the context of services provided by the library. Many of the puzzles created were quite challenging, and invariably necessitated working collaboratively with peers, or seeking out the research tools and services provided.

An example of one of the puzzles used, referred to as the "Little Sister Puzzle," consisted of a series of images hidden throughout the library. Within the context of the narrative, participates were to explore the library to discover the favorite study spaces of one the characters. Once all of the images were collected, they created a puzzle that actually indicated in advance where the game would conclude.



The puzzle is solved by using the first letter of each image provided to spell out a location within the library.

The Book

The “Lost Book” which the game characters and players searched for turned out to be a commonplace book – a sort of shared journal in which players were encouraged to write about a book that was life-changing or otherwise meaningful for them. In finding it, players not only completed a puzzle, but were given agency to contribute to the artifacts of the game. The book was made using a Japanese bookbinding technique that allowed for pages to be added or removed without damaging the integrity of the book. The pages were then seeded with anecdotes from the authors and various colleagues to illustrate some of the desired player content. The book

was then added to Hale Library Reserves and made available for checkout – players simply had to ask for it after solving a particular puzzle.

The Endgame

While finding the book was a large part of the game it was not the finale. Clues left at the KSUL Special Collections Department help desk and in an intensely difficult pictogram drove players to a well-known, spacious study room that features large murals and impressive gothic architecture. The room is in fact lovingly coined "The Harry Potter Room", adding to the whimsy of the narrative. Players who found the clues directing them to this room at the appointed date and time discovered the authors present with the Lost Book and several "achievement badges" containing a final narrative couplet and the completion date and time, only available at the endgame. Players were then invited to participate in a slightly modified version of the children's game "sardines" where they brought their own books to read and join the group.

Because no game functions well without rewards, endgame players were also given KSUL branded flash drives pre-loaded with additional games, stories, music, and puzzles taken from open source websites. These digital objects also encouraged players to continue searching for free materials online that they might also enjoy. The prize, ultimately, was greater knowledge.

Results

Using Google Analytics, circulation statistics, and player contributions to the Lost Book itself, the authors were able to assess a number of facts about the players. Google Analytics indicated the following about the number of players who found the website:

- Visits: 197
- Unique Visitors: 156
- Pageviews: 596
- Pages / Visit: 3.03
- Avg. Visit Duration: 00:03:04
- New Visits: 79.19%
- Return Visitor Rate: 22%

As the figures above suggest, not only did many players find the site, many returned and spent significant time reading the content on each page. The average visit duration is particularly exciting as three minutes is a very long time for any web page visit.

Circulation statistics indicate that the lost book was checked out on nine separate occasions and browsed an additional nine times since first appearing on Hale Library Reserves. After subtracting the pre-seeded contributions, a total of eleven entries were added by players during the course of the game. Visits to the website and Lost Book checkouts continued after the original run of the game.

The most surprising statistic arose from the composition of endgame players. The gaming industry standard places female gamers at about 40% of the whole. Of the Lost Book endgame, 80% were female. How this anomaly came about with the Lost Book ARG is unclear, but the authors speculate the whimsical and literary nature of the narrative along with the cooperative elements of play may have struck a chord with this demographic. More research is needed to determine the nuanced effects the narrative and mechanics may have on player gender.

The players who made it to the endgame were extremely positive about their experience. They asked questions about puzzles they couldn't solve and encouraged the authors to create more games soon. "Let me know when you do this again!" was echoed by several who finished as a group. One player even asked, "This was so fun! How do you get to do this as part of your job?"

The analytic results along with the verbal reactions and comments from players led the authors to believe they had been successful in positively affecting players' attitudes towards the library. While quantitative evidence was difficult to parse with this first test, results were encouraging enough for this game that the researchers were able to secure administrative buy-in to create a second, more expansive game. The numbers gathered combined with the positive qualitative evidence from the endgame players suggest that game-based learning did positively impact attitudes towards the library; players were interested, they participated voluntarily, and those that offered comments were very excited to have been a part of this experience in the library.

Next Steps

While building the Lost Book ARG was time consuming, tangible costs were virtually nil – a few sheets of paper, printing ink, sidewalk chalk, and a used book summed up the material components. Prizes awarded were free digital objects delivered on pre-existing library marketing materials, and prestige; again no costs were incurred. By demonstrating to library administration how successful we could be without allotted funds, we were able to ensure greater buy-in and increased funding for future endeavors. "The Lost Book" was in many ways a pilot program. Because this endeavor was a pilot program, only five days was allotted for play. Five days is incredibly short as ARGs go (many take several weeks or longer) and the difficulty was designed to become progressively easier rather than harder in order to empower players to accomplish the stated goals. Due to the pilot's success, the authors have begun designing another game, one with increasing depth, difficulty, timespan, and rewards; a game that can grow over time and encourage students and other members of the Kansas State University Community to collaborate and engage with one another to solve problems and learn about the their environment. The author's goal is to create what Jane McGonigal, in her 2010 TED Talk, calls "Epic Meaning" ("Gamers love to be attached to awe-inspiring missions to human planetary-scale stories."); to create scenarios and narratives that draw on the collective intelligence of a university campus to start working together in-game to solve meaningful problems.

According to McGonigal (2010) gamers are "super-empowered, hopeful individuals. These are people who believe that they are individually capable of changing the world." Granted, the worlds upon which gamers effect change are typically virtual, but that can become a model for effecting change in the real world. The essence of gamers' persistence and dedication to games is that all challenges are surmountable if they are willing to be their best, and gamers have shown incredible will in being their best. When education becomes a game the engagement in the classroom and passion for learning will be staggering.

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ABOUT THE AUTHORS

Professor Joelle Pitts: Assistant Professor/Instructional Design Librarian, Kansas State University Libraries, Undergraduate and Community Services, Kansas State University, Manhattan, Kansas, U.S.A.

Professor Daniel Ireton: Assistant Professor/Undergraduate and Community Services Librarian, Kansas State University Libraries, Undergraduate and Community Services, Kansas State University, Manhattan, Kansas, U.S.A.

Benjamin Ward: Instructional Designer, Information Technology Assistance Center, Kansas State University, Manhattan, Kansas, U.S.A.

The International Journal of Technology, Knowledge and Society explores innovative theories and practices relating technology to society. The journal is cross-disciplinary in its scope, offering a meeting point for technologists with a concern for the social and social scientists with a concern for the technological. The focus is primarily, but not exclusively, on information and communications technologies.

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