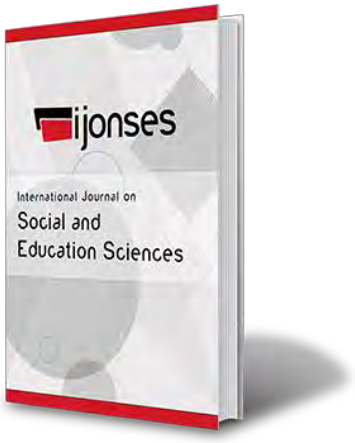

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Quelling the Boredom with Alternative Instruction: Augmented Reality, Escape Kits, and Scavenger Hunts

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Abstract

From 2016-2019, Jacksonville State University (JSU) librarians embraced the call to incorporate increased active learning into traditional library information instruction. Librarians began this process by integrating the use of a scavenger hunt into the Houston Cole Library's new orientation tailgate event. Breakout EDU Escape Room kits with a custom-built storyline were added to teach basic research skills and help lessen library anxiety in First Year Freshman Experience courses. Augmented reality (AR) was incorporated into Business Orientation classes to increase student understanding of specialized business information resources. These activities helped librarians fulfill Houston Cole Library's mission of creating a student-driven learning environment focusing on the Association of College & Research Libraries (ACRL) information literacy framework. The research, planning, and implementation processes involved in the initiation of scavenger hunts, escape activities, and AR interactive stories at JSU have numerous applications across all educational levels and disciplinary focuses.

Introduction

Information literacy education is of great concern to academic librarians. The Association of College and Research Libraries (ACRL) defines information literacy as ~~"~~the set of integrated abilities encompassing the reflective discovery of information, the understanding of how information is produced and valued, and the use of information in creating new knowledge and participating ethically in communities of learning" (Association of College & Research Libraries, 2015, p. 8). This is also further defined through six threshold concepts, referred to as *The Framework for Information Literacy for Higher Education*.

Librarians at Jacksonville State University wanted to try new pedagogical techniques to increase student engagement and motivation, especially regarding *The Framework for Information Literacy for Higher Education* concepts. Historically, classes were taught by librarians on a one-time basis each semester, usually relating to a research assignment, without a direct grade to motivate students to grasp basic information literacy concepts. Trying a new instruction technique was especially timely, because instruction requests by faculty had decreased, and gamification techniques could create buy-in and interest for faculty.

The first, large-scale attempt at using a game for instruction purposes was in the Houston Cole Library Tailgate Open House, which invited students to explore library services through an interactive, self-paced, football-themed event. The Library Tailgate event utilized various forms of the scavenger hunt to convey orientation-level information regarding Houston Cole Library (HCL) (Westbrooks et al., 2020). The second utilization of game-based instruction was through an escape experience. Students in freshman orientation classes attempted to escape from a challenging situation via clues given to them from a series of locked boxes. The third use of instruction at HCL using gamification was an augmented reality game used for a business orientation class in order to introduce business students with subject specific resources and the ways in which this information could be used in fictitious scenarios. The process by which research, planning, and implementation was done to begin gamification in Houston Cole Library's information literacy instruction is the subject of this mixed methods case study.

Definition and Impact of Gamification in Academic Libraries

Before Jacksonville State University (JSU) librarians began gamification efforts in fall of 2016 with scavenger hunts, a library game staple, gamification had already made an impact on libraries, especially public libraries, with videogames collections and gaming programs (Kim, 2012; Harris & Rice, 2008). Academic libraries had some involvement with gamification since the 1990s and saw a steep increase in gamification activities in the late 2000s, according to a rise in published literature (Crowe & Sclippa, 2020). By 2008, a library science book, *Gaming and Academic Libraries,* discussed gamification and its rise in popularity among academic libraries. Harris and Rice predicted that "gaming in academic libraries is a trend that will likely continue as more libraries become aware of its usefulness... for teaching information literacy skills" (2008, p. viii). By 2012, library and other higher education literature, like the 2012 *Horizon Report*, acknowledged game-based learning was on a fast track to adoption in academia (Kim, 2012, p. 465) and joined other well-established education trends, active learning and flipped classrooms, both of which were already in common practice among academic libraries (Crowe & Sclippa, 2020).

As academic libraries utilized gamification more, it necessitated adopters to look to other disciplines for clarity and ideas. Library literature definitions of gamification came from the gaming and game design fields and focused on characteristics like game mechanics, game thinking, user engagement, and problem solving (Kim, 2012; Walsh, 2014; Felker, 2014). Interlinked with these definitions were ideas centered on gamification design that was fun and motivating (Pun, 2016; Felker, 2014). Francis' definition succinctly captured all the facets of gamification as "the application of game design, thinking, and mechanics in order to enhance motivation, engagement, and fun" and adequately defined the purpose of our paper (2017, p. 50).

Working within the confines of these similar definitions, academic libraries foresaw the multitude of advantages in gamifying the library experience: easing library anxiety, development of critical thinking skills, retention of information, and increasing student engagement and motivation (Walsh, 2014; Francis, 2017; Veach, 2019; Crowe & Sclippa, 2020). Gamification endeavors ran the gamut: murder mysteries used to improve users research skills, mobile apps used for orientations, a partnership with a design company to create an educational

gamified platform like Lemontree, and incorporation of escape room kits like Breakout Edu. Application of gamification in libraries was diverse. (Felker, 2014; Walsh, 2014; Pun, 2016; Edson, 2019).

Regardless of its delivery, gamification's focus on "playful engagement" provided academic libraries an alternative way to reach their learners by bringing game elements into a non-game environment (Walsh, 2014, p. 42). Incorporation of those game elements demonstrated gamification's umbrella effect: one does not need to use a real game in order to apply game design elements in a scenario; however, a facet of gamification that required intentional use of games to meet educational learning objectives fell into the subcategory known as game-based learning (Subhash & Cudney, 2018). Likewise, as she did with gamification, Francis defined game-based learning as the integration of a game into an educational setting to ease the learning process. She noted the pair's similarities; however, recognized the glaring difference between them. Gamification took up an entire class, while game-based learning was only a small component of the classroom – it did not drive the entirety of the educational experience (2017).

Understanding of how gamification and game-based learning worked in tandem, while still existing independently, gave academic librarians unfettered creative license to apply the principles of game design. A game or a gamifying experience could thrive or fail based on concept application, project goal setting, target audiences, and appropriate incorporation of game elements (Danforth, 2011; Kim, 2012; Felker, 2014; Pun, 2016). Felker (2014) noted that in "designing a good and engaging game means leveraging a multitude of skills..." to answer the question, "How can we create a fun experience?" His recognition of required skill sets acknowledged the challenge faced by many academic librarians, the overall lack of game design training (p. 21). Nevertheless, library literature is rich with case studies and best practices highlighting step by step, winning formulas for gamifying library learners' experiences. The key lies with motivation of the creator and learner, while also tying it to strong information literacy concepts, which bulwarks gamification's overall effectiveness as an alternative instructional method.

Gamification, Motivation, and Information Literacy

Multitudes of studies have chronicled the impact that gamification and game-based learning have had as an instructional method on diverse fields with a particular concentration on K-12 and higher education (O'Brien & Pitera, 2019; Subhash & Cudney, 2018; Hanus & Fox, 2015). Focus primarily centered on how gamifying an educational scenario effected motivation, and engagement of learners, as well as how crucial both are to gamification success in enhancing learning (Subhash & Cudney, 2018). To demonstrate exactly how successful gamification is achieved within a discipline, our mixed method case study focuses on gamification and game-based learning taking root within academic libraries as a means of instruction. Special attention is paid to the process of gamifying library instruction and its impact on motivation and engagement (Harris & Rice, 2008; Crowe & Sclippa, 2020).

Like many other fields, academic libraries largely followed traditional teaching strategies to educate learners through the mid-2000s. The focus of their teaching centered around the pedagogy, information literacy, which is

"the set of integrated abilities encompassing the reflective discovery of information, the understanding of how information is produced and valued, and the use of information in creating new knowledge and participating ethically in communities of learning" (Association of College & Research Libraries, 2015, p. 8). Felker (2014) pointed out that "instilling basic information literacy tenets" into learners was the core teaching mission of libraries, especially academic libraries (p. 20). Many academic librarians taught the development of research skills to facilitate a learner's critical thinking connection with research methodologies and information understanding. These learners absorbed the research lessons through their own personal, social group, or discipline understanding of the world, which meant teaching librarians faced the challenge of teaching information literacy to a classroom full of individual, diverse learners, all while on a strict time limit (Dent & Schneidermann, 2020; O'Brien & Pitera, 2019). Academic librarians were faced with an overwhelming mission.

Academic librarians felt that information literacy challenges, particularly those of time limits and differing amounts of student information literacy background knowledge, were met succinctly and memorably with gamification. Many academic librarians only receive one chance (one-shot) in a classroom in a semester to state facts needed for the students to successfully complete a research assignment, paper, or general library exercise. The traditional library one-shot instruction makes the instruction high-stakes, either it fails or succeeds. The librarian gets only one chance to teach a plethora of concepts and make them memorable, or they fail, and the instructor sees the librarian's use of class time as a waste, frequently not inviting them back into the classroom. Due to this, HCL librarians realized that, from a motivation and engagement standpoint and to achieve the JSU's mission of student-led learning, traditional information instruction was limited in its effectiveness to learners' critical thinking development. This one-shot version of instruction with all of its pitfalls made a perfect training ground for new alternative instruction techniques like gamification.

At JSU, prior to the use of game elements in instruction, invited presentations for information instruction had dropped to an all-time low. Discussions among librarians ensued as to how to revive stagnant instruction sessions and create a dynamic and robust learning environment with a specialized focus on student motivation and engagement, which became paramount to librarians at Jacksonville State University. Alternative instruction methods considered were ranked according to their ability to motivate and engage students. After an intensive phase of research, gamification was selected as the instructional method to implement. The literature more than supported gamification's impact on motivation as well as engagement (Capdarest-Arest et al., 2019; Walsh, 2014; Hanus & Fox, 2015; Veach, 2019; Francis, 2017; Crowe & Sclippa, 2020). Games or gamifying experiences are a successful way in harnessing student motivation and engagement (Subhash & Cudney, 2018).

Gamification can solicit different types of motivation from learners depending on its construction, and it is because of motivation that learners will tackle a challenge, engage with new content, and persevere when confronted with hardships. Academic librarians focus primarily on the "motivation to learn" when teaching students (Francis, 2017, p. 1). With so many reasons to influence motivation, one can understand that there would be many different types of motivational theories based upon the needs of various groups. Regarding gamification, many motivational theories like Goal Setting Theory, which is "the idea that for people to act, they must have established a goal or end result, which supplies the purpose for the action" (Francis, 2017, p. 10)

would fit neatly into certain game design parameters when applied. However, the Self-Determination Theory when applied appears to have the most natural fit regarding gamification construction, and its ultimate success.

Self-Determination Theory breaks down motivation into intrinsic or extrinsic. Francis (2017) describes intrinsic motivation as ~~"a~~n internal drive of interest, desire, or enjoyment" (p.11) while stating that extrinsic motivation ~~"i~~s caused by external influence, such as reward or punishment." (p.11). Regardless of their differences both are necessary components of a gamifying experience as it is possible for ~~"i~~ntrinsic and extrinsic motivation to coexist independently for the same activity" (Kim, 2015, p. 33). However, it is also often noted within the literature, learning experiences designed to engage intrinsic motivation are preferential to learning experiences engaging extrinsic motivation (Kim, 2015; Small et al., 2004; Crow, 2007; Hanus & Fox, 2015; Subhash & Cudney, 2018).

Much of the intrinsic versus extrinsic motivation debate centers around what educators do to trigger motivational impulses. In gamification, the quality of the game design and elements, as well as the reward system, can drastically determine or inhibit player motivation (Felker, 2014; Hanus & Fox, 2015). It is for this reason that intrinsic motivation, because of its reliance on a learner's natural, internal desire to participate ~~"i~~n a learning experience that stimulates their curiosity and interest" (Small et al., 2004, p. 99) is the preferred pathway to create sustained and independent, lifelong learning.

A challenging learning environment, like well-designed games, feeds this type of intrinsic motivation. Extrinsic motivation, however, because it is built on external features like rewards or another person's control, can negatively impact the learning experience. The gamification literature points out the perils of gamifying based completely on extrinsic motivations, highlighting the fact that learning environments that rely heavily on extrinsic rewards like prizes, badges, or points, have been proven to decrease the intrinsic drive of learners (Hanus & Fox, 2015; Small et al., 2004; Walsh, 2014; Kim, 2015). Ultimately, motivation that comes from the desire inside a person to learn, has been shown to create learners who are "m~~"~~ore engaged, retain information better, and are generally happier" (Hanus & Fox, 2015, p. 153).

This is not to say, however, that extrinsic motivation should never be used to entice learners. In gamifying information literacy, academic librarians also want intrinsic motivation to be at the core of why learners continually consume and evaluate information, and yet, to achieve that goal can be quite difficult. As previously mentioned, academic librarians' normal learning environment is a one-shot information literacy session with learners they have just met. Francis (2017) points out that to engage intrinsic motivation in learners takes a certain amount of ~~"t~~ime and connection" (p. 14) that may not possible to achieve in one session. Extrinsic motivation channeled through gamifying can help to fill that gap with learners that seem disinterested and help promote the beginnings of intrinsic motivation (O'Brien & Pitera, 2019). Furthermore, Francis (2017) notes that extrinsic motivators lose effectiveness due to non-continued usage, and the very nature of the one shot negates this effect, because there is no continuation. Overall, intrinsic and extrinsic motivation acts as the necessary key academic librarians need to tie gamification into the threshold concepts of information literacy.

Gamification and Information Literacy Threshold Concepts

A threshold concept is a core idea or process that enhances or changes the way a discipline thinks and practices and is a highly effective pedagogy for teaching discipline-specific, core concepts (Association of College & Research Libraries, 2015; Townsend et al., 2011). Academic librarians were formally introduced to their threshold concepts, *The Framework for Information Literacy for Higher Education* in 2015, often referred to as the Framework, and instruction based on the information literacy framework became a common learning objective. The Framework (2015) is defined as a "cluster of interconnected core concepts, with flexible options for implementation" ...that encompasses the conceptual workings of information, research, and scholarship ~~–in~~to a coherent whole" (p. 7). The six frameworks are: authority is constructed and contextual; information creation as a process; information has value; research as inquiry; scholarship as conversation; searching as strategic exploration (Association of College & Research Libraries, 2015).

Within the library literature are scattered case studies that show how academic librarians have applied the Framework to different types of gamifying experiences. Francis (2017) provides librarian created lessons that center around each of the frameworks through game-based learning. Crowe and Sclippa (2020) follow a similar method with several chapters chronicling the specific use of escape room kits and the Framework. Hanz and Kingland (2020) demonstrate how they applied the frames to their fake news game, while Pun (2017) posits the applicability of the Framework to his library's escape room game. Successful achievement of uniting the Framework to gamification efforts in each scenario focuses on using gaming tools to engage learners. The mixed methods case study presented here, follows a similar recipe with the authors highlighting two of the six concepts, information has value and searching as strategic exploration, and the significance of gaming tool incorporation.

Ultimately, gamification and game-based learning are a powerful way to engage learner's intrinsic or extrinsic motivation and investment into information literacy learning objectives. It is games and gaming tools that drives the momentum. Games provide learners with opportunities to engage with content in new and exciting ways (Francis, 2017). Research shows that gamifying experiences can increase a learner's motivation regarding uninteresting content, which some students find to be the case with information literacy (Hanus & Fox, 2015; Dent & Schneidermann, 2020).

Gaming also creates environments of active learning and interaction that can promote the synthesis and recall of content, as well as low risk environments where learners can become comfortable with failure, which is necessary for successful academic growth (Francis, 2017; Hanus & Fox, 2015; O'Brien & Pitera, 2019; Subhash & Cudney, 2018). Overall, gaming can ignite motivation to enhance learning and provide a positive engagement experience with well-designed gaming tools. All levels of library teaching and learning, whether they be undergraduate, graduate, or specialized can make use of these tools (O'Brien & Pitera, 2019; Veach, 2019; Laubersheimer et al., 2016). This paper will focus on the processes by which instructional gaming tools were used to revamp traditional information literacy instruction at JSU using scavenger hunts, escape rooms, and augmented reality.

Background

Sometimes a need arises that necessitates a complete deviation from a set course. Any place, person, or event can experience it, and if handled well, can better the future. In 2016, Jacksonville State University's Houston Cole Library (HCL) experienced this type of phenomena with their information literacy sessions. Subject specialist librarians were experiencing a decrease in faculty requested information literacy sessions. Reasons as to why were considered along with possible course corrections. Ideas that sparked the most interest centered on reworking traditional information instruction into sessions that were more dynamic, increasing student-driven motivation and increasing student-led engagement. This led to informal conversations among the librarians and consideration of different types of alternative instruction to implement. It was this exchange of ideas that led to gamification and game-based learning.

Gamification was not unknown to HCL librarians, as it was a well-discussed trend within higher education literature (Hanus & Fox, 2015; Subhash & Cudney, 2018), as well as a very present and active movement within JSU's campus. Jacksonville State University's student population was already engaging with games, voluntarily. The JSU Collectible Card Game (CCG) and Tabletop Club was the largest non-Greek organization on campus. JSU's Level Up Club, a club for video game enthusiasts, had a healthy, steady growth and regularly hosted tournaments. JSU faculty in other departments had already began game-based learning and badging incentives in online learning environments. The public libraries in the surrounding areas also had active game programs with some that catered to the JSU student age range. This proliferation of game-based learning and gamification already in progress on campus, made the choice to gamify a natural fit over other options that had been under consideration. With the alternative method determined, participating HCL librarians began to devise where to begin with the gamification process regarding information literacy.

At Houston Cole Library, instruction sessions typically fall within two categories: subject-based or general. Subject-based instruction is taught by the designated subject specialist librarian. General instruction, usually involved with orientations or preparatory classes, can be taught by any HCL Public Services librarian, regardless of subject specialty. Researching, planning, and integrating gamification and game-based learning into HCL information literacy sessions was handled individually and collaboratively by librarians. Determination of which path to take depended upon several key questions:

1. What type of information literacy session would be gamified? Subject-based or general?
2. What type of gaming tool would be used?
3. How would the gaming tool be used within the session?
4. What were the session's learning objectives, and could they be tied to gamification?
5. To what depth should a session be gamified? Is complete gamification or more game-based learning the aim?

The answers to these questions ultimately laid with the librarian and the gaming tool they wanted to implement. This mixed method case study details the successful implementation of three types of gaming tools: scavenger hunts, escape room kits, and augmented reality. Also documented is the gamifying method chosen by librarians

and the usefulness of an integrated approach with gamification and game-based learning.

Scavenger Hunts

Scavenger Hunts: Research

The scavenger hunt experience was a part of Houston Cole Library's first, large-scale game-based learning effort to orient students to library services, inspired by Auburn Libraries (Noe, 2016). This scavenger hunt was themed based on the success and popularity of the JSU football team and popularity of college football in the Southern United States. While scale, location, and learning objectives were entirely different, Auburn University's event was proof that a scavenger hunt could work to attract, motivate, and engage students in basic library information. Direct contact was made with Nancy Noe to discover more about the planning process (Noe, 2016). Additionally, research was conducted to gain a broader understanding of open houses and orientation programs within academic libraries.

Scavenger Hunts: Planning

The HCL Instruction Committee and the HCL Public Relations Committee were both involved in the planning process of gamification efforts. Each of these committees were instrumental in the planning process by developing acceptable guidelines for learning objectives, especially with respect to orientation to library resources. The ACRL Framework information literacy concepts to be covered were Information Has Value and Searching as Strategic Exploration (ACRL, 2015). These learning objectives led to decisions concerning the places that would be visited in the scavenger hunt activity, working to achieve a holistic library experience showcasing HCL's information and how to begin strategic exploration. Due to the large expected number of students and their differing schedules, each student would be responsible for their own scavenger hunt experience. The hunt had to be simple enough to be done with little guidance, and although the scavenger hunt was themed, there was no real story development involved. Open-ended email feedback from game event planners involved with Houston Cole Library's Tailgate event, noted the long hours and preparation for such a large-scale event, but planners felt that this was rewarding, fun, and worthwhile. (Westbrooks et al., 2020).

The proposal document was integral in summarizing the research phase, outlining learning objectives, timeline expectations, and defining resource needs to library faculty, staff, and administrators. Stakeholders can be numerous in a gamification project. The proposal kept all involved, communicating in a clear, concise fashion. The proposal received revisions, and later, approval from administration. Such involvement rendered administrative buy-in into gamification projects.

Scavenger hunts are flexible, which works particularly well in an institution amongst change. In fall 2016, the Tailgate scavenger hunt points of interest were held throughout HCL's twelve floors. Changes in fall 2017 to better accommodate larger numbers of students led planners to hold all points of interest for the Tailgate scavenger hunt outside around the covered exterior perimeter of the library building. In the spring of 2018, an EF-3 tornado hit the JSU campus, and large construction zones dictated that the scavenger hunt event be held

digitally. Construction progress allowed the fall 2019 Tailgate scavenger hunt points of interest to move to an outdoor plot neighboring the library.

Scavenger Hunts: Implementation

Testing of the Tailgate Ticket scavenger hunt was done by asking library faculty and staff to visit each of the locations necessary to complete the Tailgate Ticket event. While the trial run of the scavenger hunt with faculty and staff went smoothly, the first year's event saw a major flaw in an overcrowding of the elevators. The following year addressed elevator crowding and crowding of other common areas by moving game play outside, around the building, over a longer period – four hours, instead of two. While moving the event outside and lengthening the event alleviated the issue of elevator congestion, a new logistics issue was created, staffing of service points within the building. This issue was alleviated with careful planning and assistance from library student workers to cover service areas. While each year had its own set of challenges, an open email and an open meeting freely inviting feedback from HCL faculty, staff, and student workers for improvement has proven helpful. A survey was also administered to all students who participated in the JSU Tailgate event, which gives a good gauge of how the students discovered the event and what the students liked about the event.

Theming was important to create interest, because this was to be a student-driven learning experience. Theme also dictated that the scavenger hunt took the form of a ticket, much like to a football game. This Tailgate Ticket spurred attendees to visit a number of Tailgate tables staffed by library faculty and staff in relaxed attire and inviting engagement with additional information surrounding library service points. Many of the tables also had bookmarks, matching games, and candy, determined by the HCL faculty member or staff member working at the Tailgate table. Tailgate tables were colorfully decorated with school colors, balloons, and streamers. The Tailgate Ticket scavenger hunt was complete when students visited all of the Tailgate tables listed on the ticket and received a hole punch from each Tailgate table. For completion of the Tailgate Ticket scavenger hunt, the student got a small bag of donated items from database vendors and local merchants. All completed Tailgate Tickets were entered into grand prize drawings for larger prizes, also donated by library vendors and local merchants.

Escape Room Kits

Escape Room Kits: Research

Research into the incorporation of escape rooms into information literacy sessions began in an unusual place, a campus outreach partnership. In the 2018 spring semester, campus counseling services and HCL librarians cohosted an event centered on the promotion of emotional intelligence. This was not an uncommon occurrence for campus units to partner with the library for events; however, what made this event unique was the integration of gamification in the form of hosting an escape room, ~~"~~a live action team-based game" (Veach, 2019, p. 561) in which players have a limited amount of time to solve puzzles via clues in order to complete a goal, like escaping a from a physical room (Veach, 2019). Escape rooms can be constructed with a variety of materials and storylines. Their primary purpose is to be fun and entertaining, but by their very design they also

promote active learning and research skills (Edson, 2019). Due to this, they can work well as educational tools. For the emotional intelligence escape room, facilitators did not have the time or game design resources to build an escape room from scratch. Instead, an educational kit was used to help with setup. The kit was purchased from an educational gaming company, Breakout EDU. Veach (2019) described Breakout EDU as a company that shifted the idea of escape rooms in a creative fashion. Instead of trying escape from a physical room, participants tried to break into locked large and small boxes. These kits were bought from the company, and they came with access to a digital platform with premade game storylines, all the necessary combination locks, and additional materials like invisible ink marker and UV light (Veach, 2019).

The event was held over the course of one day and student teams signed up from across campus. General feedback of the experience was positive. Plans were quickly made to use the kit again in time for HCL's finals week, Gaming Day, an event held to give students a chance to decompress from the stress of studying and taking final exams. Once again, use of the escape room received positive feedback. The use of the Breakout EDU kit was proving to be a wonderful library outreach tool. However, it was also during the same spring semester that HCL librarians attended a state library conference where Jennifer Pate and Derek Malone, University of North Alabama librarians, discussed their work with incorporating the Breakout EDU kits and developing their own storyline into their first-year orientation information literacy classes. The presentation demonstrated how complete gamification of an information literacy class could be accomplished in a feasible manner. The presentation, the successful outreach events, and the consulting of relevant library literature motivated HCL librarians to truly consider the kits as a viable instruction method for increasing learner engagement.

Escape Room Kits: Planning

With strong evidence of viability as a gaming instruction tool, the research phase on escape room kits came to a close, and HCL librarians shifted attention to planning. The overarching question that needed to be addressed before planning could truly begin, centered on whether or not escape room kits would be a good fit for Houston Cole Library. Research had demonstrated that universities and colleges of various sizes were able to scale escape rooms, as an instructional gaming tool, according to their needs and offer realistic, viable information literacy sessions that were motivating and fun. So, HCL librarians began to look at peer institutions more closely, like the University of North Alabama's Collier Library, in order to study more about their escape room implementation process. Ultimately, the conclusion was reached that implementing escape rooms as an instructional method at Houston Cole Library would be an achievable process. This led to the next step which focused on two parts: which type of information literacy session would be gamified with the escape rooms, and will the learning objectives pair well with gamification application? Discussion ensued among the librarians, and it was determined that the most logical choice to gamify using the escape room would be a general information literacy session.

The specific session chosen was a pass-fail orientation class called STU 101: First Year Experience. The learning objectives for the STU 101 information literacy session focused on introducing first time college

students to the library and its resources. Those initial information literacy sessions focused closely on traditional library instruction with a heavy emphasis on resource skills learning. Feedback received from the STU 101 coordinators indicated to librarians that many students were frustrated by the class, due to the duplication of content received in other first year, subject-based information literacy sessions. For this reason, students lacked motivation in engaging with content and questioned the value of the STU 101 information literacy session. HCL librarians realized that the entire session had to be rebuilt into a fun and student driven experience in order to better engage with first-time college students. Discussions involving how to implement the escape room kits were happening during the STU 101 reconstruction phase, and it was quickly determined that the STU 101 information literacy session could be gamified with the escape room kits.

Planning commenced on how gamification would overall work within the session. It was decided to create a proposal to garner library administration buy-in by detailing the benefits of escape rooms as educational tools, as well as request to purchase four of the Breakout EDU kits with digital platform access. The decision to invest in Breakout EDU kits centered on time constraints faced by HCL librarians to have the gamified STU 101 library session ready for the fall semester, a lack of training in game design, and knowledge that use of the Breakout EDU kits would be multi-functional. They would be used in information literacy sessions, as well as library outreach programs. Ultimately, library administration approved the proposal and purchase of the kits. The next step in the planning process was to determine how to best integrate the escape room and learning objectives in order to create a student driven, gamified learning environment.

In this stage of the planning process, HCL librarians faced a big question: Did they want to create their own escape room storyline or use one that was provided by Breakout EDU's digital platform? As aforementioned, HCL librarians had previously used Breakout EDU storylines in their library-campus outreach events and those had proved quite successful. However, the librarians wanted to use the escape room kits to introduce STU 101 students to necessary library orientation information. Unfortunately, none of the Breakout Edu readymade storylines fit with the STU 101 information learning objectives. HCL librarians started to investigate the option of creating their own storyline, which was an available option with the Breakout EDU kits. The company provided step by step instructions via their website. Librarians also consulted library escape room case studies, and eventually, decided to base their efforts off a regional peer institution, the University of North Alabama's Collier Library, who successfully integrated escape rooms into their first-year experience library session. Furthermore, Collier Library's successful implementation served as inspiration to HCL librarians during the research phase.

HCL librarians used the LOEX paper, "Beyond Reinventing the Library Scavenger Hunt: Teaching Library Literacy to FYE Students Using an Escape Room" by Jennifer Pate and Derek Malone as the model for their escape room initiative (Pate & Malone, 2018). The game design and game elements of Pate and Malone's work matched perfectly with the gamified educational learning objectives for the STU 101 library session. HCL librarian, Karlie Johnson, began adapting the game design by creating the storyline first and reworking learning objectives to match the story while eliminating those that were overly complicated or outdated, due to gamification efforts. Johnson shaped the gamified learning objectives around the information literacy threshold

concepts, information has value and searching as strategic exploration (Association of College & Research Libraries, 2015). She then focused on what library elements first year JSU students would need to know. Once those elements were determined, she changed focus to game elements like clue creation, determining how many escape room kits would be used, and what types of game pieces would be needed such as lock types. The game creation and design took several weeks of trial and error before testing could commence.

Escape Room Kits: Implementation

Testing started during the summer semester at JSU, which also coincided with campus student population being at its lowest. Early testers for the escape room game consisted of HCL librarians, staff, and student summer workers. Several test runs were held, and feedback concerned the difficulty or ease of clues, time completion of game, gamification emersion effect, and student driven learning. The feedback helped to rework clues and clarify directions and gauge interest in the overall escape room game experience. From informal observations, participants seemed engaged and motivated to complete the game. Informal comments, especially from the student testers, supported the informal observations. Johnson noted, however, that there was a fundamental issue with these first initial rounds of testing. The escape room game was designed to gamify the entire STU 101 information literacy session in order to promote motivation and engagement. Furthermore, the game was designed to be completely student driven, peer to peer learning, where librarians were only facilitators or guides helping as the need arose. The targeted audience was first-year college students who held little to no knowledge of the Houston Cole Library. All the testers were individuals who were well-versed in library resources and knowledge. This, unfortunately, somewhat skewed informal observations and feedback. To account for this issue, Johnson determined that the initial launch of the STU 101 escape room game would be a test pilot program to gather more information and observations to adjust the game experience, accordingly.

Over 20 STU 101 classes participated in the pilot program, and informal observations and feedback led to several changes. Initially, only two escape room kits were going to be used in the game. It became quickly apparent that more kits were needed as class sizes, which were not known until the actual class, were larger than anticipated. Two additional kits were added to bring the total to four, and it made a positive difference. Smaller groups equaled more interaction with the escape room game, which created momentum for more engagement. It also negated the effect of the game only being played by a few students, which was a major problem with just two kits. With less students in the group, everyone had a chance to play, which seemed to feed intrinsic motivation of some learners. Prizes were used as a form of extrinsic motivation for learners that initially seemed disinterested, as well as to begin facilitating a path to intrinsic motivation. The pilot program also revealed that certain clues, which had been deemed to be very easy to solve in the first round of testing and were accordingly adjusted, proved to be entirely too difficult for first-year students to solve. This necessitated a librarian coaching students through problems more often than anticipated. Once the clues were readjusted to the target audiences' skill level, librarian intervention leveled to more anticipated levels of interaction. Overall, the test pilot of the escape room game proved to be a great success and laid the foundation for formal assessment to take place in the next round of testing.

Augmented Reality

AR: Research

Many options are available for augmented reality (AR) experiences. Reading technological and educational reviews and corresponding with librarians guided the research process. Of all the applications that are available for augmented reality, the Metaverse application was chosen because it was freely accessible in electronic application stores, for both iPhone and android users. Also, all students in the intended audience had access to a personal device. The JSU Distance Librarian, Yingqi Tang, had used Metaverse with success and recommended its use. Museum information specialists had success with AR in creating digital, interactive stories using Metaverse to link attendees to physical exhibits (Choi & Kim, 2017).

AR: Planning

The Department of Business and Industry at Jacksonville State began a new class in 2019 in need of targeted library instruction to address the highly specialized information needs of business students, CBA 115 Business Orientation & Fundamentals. The HCL subject specialist emailed and met with the CBA 115 course instructor to determine the information literacy concepts to be covered through instruction and AR was determined to be a viable option for coverage of the information literacy concepts. The information literacy concepts to be covered were Information Has Value and Searching as Strategic Exploration (ACRL, 2015). These concepts guided the creation of the story created within the Metaverse application.

Using the free Metaverse application, the HCL subject specialist, Kim Westbrooks, created a linear story for each of the three sections of Business Orientation. Progression in the story was achieved by helping a fictitious character solve business problems using specialized business book titles and business information databases. Using the Metaverse application on their personal devices, students interacted with the story, its characters, and input information found both in physical and digital formats to advance to the next part of the story. Taking a selfie, finding information in a specific book at the Houston Cole Library, searching for a data point in a business database, and answering a basic access question about business information available at the library, were all challenges necessary to complete the Metaverse storyline. Students received a grade for AR game completion.

AR: Implementation

This experience was helpful, because each student had a personal interaction with specialized business information. Each of these classes contained 175 to 250 students, not typically an ideal setting for individualized learning experiences. The students had a month to complete the AR library game assignment, to spread out crowds and discourage cheating. Students also had to take a selfie in the library, which discouraged cheating. Many students, while wandering the shelves looking for clues, had positive interactions with the librarian and library staff. Although each student experience was different, feedback from students was positive, both through survey data and through passing comments made by the instructor and students.

Rigorous testing was highly beneficial for the HCL's augmented reality (AR) business experiences. An email was sent out to all HCL faculty and staff, requesting voluntary participants in the AR experience. A request for voluntary testing was also made verbally to JSU's CCG & Tabletop Club Members and HCL student workers. Each of the three AR storylines were tested by librarians, student workers, faculty, and student volunteers. Feedback was communicated to the librarian game author of the game via verbal feedback, emails, and phone calls.

Given AR game feedback, changes were numerous and highly beneficial to the overall gameplay. The physical location for clues had to be changed to ease access and relieve crowding. Directional signage was created specifically to ease the difficulty in finding clues. The game behaved much differently on iPhone and Android devices, and the different views could create problems for participants. For this reason, certain graphics had to be changed. After the students had engaged in the AR game, feedback was collected, and further changes were made. In the future, the AR game will also be offered in a paper format for those experiencing technical difficulties with personal devices.

Students were invited to engage in the AR experience during a class, after a short, 15-minute lecture defining library access and giving very general guidance on how to go about starting the AR experience. Bookmarks were printed and shared with all the students, which had the URL to the AR experience, as well as a QR code to enter the AR experience. The AR experience was also linked to each Canvas online learning classroom for CBA 115. Verbal feedback regarding the AR experience was positive, from both the students and the instructor.

Conclusion

Broadly, the timing and order of researching, planning, and implementation of gamification or game-based learning projects, is crucial. After research and planning of gamification and game-based learning projects, implementation can then begin. Implementation involved the outlining of game elements, creation of games, rigorous testing of games and game elements, promotion and marketing of games to a target audience, and the launch of pilot game-based programs. Tasks in research, planning, and implementation can take years and can be cyclical, if new research or information from a pilot group emerges, the process may need to start over again.

It is noted that research, planning, and implementation is not a linear process, and task order may vary depending on the project. Game elements may be constructed in several different ways. The experience can be engineered with the story being created first and matching the learning objectives to the story, as was done with the escape kit experiences at JSU, or the learning objectives can the determined first and the story can be created to match them, as was done with the scavenger hunt Tailgate event and the AR business information experiences. Regardless of the order, the learning objectives give the story educational purpose, and the story creates interest and investment into the educational experience.

Storytelling is a creative art and creating the elements of a story for a game experience may take time. Stories can be linear or branch into varying experiences. It has been the experience of the authors that the decisions

made in this could keep traffic in a given area in mind. A linear story can all go in the same direction, but the gaming elements are all the same. The game experience is almost the same for all involved, which works particularly well for teams. If clues and physical spaces are involved, it may mean that multiple people engaged with a linear story, even competitors, arrive at the same place at the same time. Branching experiences, in which players may come to a conclusion or complete a task in a number of different ways, can reduce traffic to a given space and reduce the number of instances by which individuals can gather clues or information about the story from other players.

While outside of the scope of this work, the authors would like to briefly note the importance of marketing within the processes. Marketing of library game-integrated events has been crucial in their success. The free, open to the public, Tailgate Ticket scavenger hunt event has been advertised via social media, school newspaper, school newsletter, JSU club Discord servers, printed flyers, and sidewalk chalk just outside of the building. The Escape Room Freshman Orientation activity and AR Business Orientation were created to fulfill a specific information literacy need. Faculty were informed of these instruction options through direct pitches. The unexpected approach of a game as an impactful instruction-module makes a fresh, welcome instruction experience. While it is hoped that this will increase the likelihood with which students will visit their library, it has certainly resulted in an increase in instruction requests from faculty, with anecdotal evidence pointing to a faculty preference for gamification teaching techniques in their classrooms. The purpose of this work has been an overview of the process whereby Jacksonville State University academic librarians have conducted research, organized a plan, and implemented gamification and game-based learning within their medium-sized, public institution of higher education, but the applications for these processes range broadly.

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