CHAPTER 11.

ADVENTURES IN ARIS: THE AFFORDANCES OF DESIGNING PLACE-BASED AUGMENTED REALITY GAMES IN THE UNIVERSITY CLASSROOM

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Mobile media are becoming the most pervasive technology on the planet. Most of our interactions with this media form are haphazard, often distracting us from our physical environments. How might designing purposeful, placed-based interactions/games on these platforms change the ways we think about our relation to the environment or the history of the place in which we live? How might it shift the ways we understand the constructedness of dominant cultural histories? Augmented reality (AR) platforms have the ability to allow humans to engage geographical space through bodily movement, intellectual thought, and emotional feeling. The potential of such platforms can be used to teach critical analysis and creative interventionist techniques in specific geographical locations. In the chapter that follows, I offer a story of my introduction to one such creative platform and the successes and challenges of teaching mobile media game design in an English course to university students in Madison, Wisconsin.

The majority of my experiences teaching in the humanities, until recently, have focused on hard-copy texts: novels in Dover editions, poetry collections in hardcover folios, plays in stapled copies. In 2011, I pushed myself out of my comfort zone—away from the smell and texture of old books and paper—and registered for the one graduate-level media course being offered in the English Department. That decision led to my increasing interest in the potential of media forms to spatialize cultural narratives and social problems in innovative ways and, in fact, influenced the direction of my dissertation project. My interest in emerging media bled into my classroom teaching and into my fascination with the ways that emerging media tools intersect with the humanities classroom.

AS a result of my interest in games in particular, I began teaching an exciting media platform called ARIS, or Augmented Reality Interactive Storytelling. ARIS is a free, open-source web-based tool that allows the designer to upload media to a mobile device in order to create situated documentaries, object quests, puzzle-based stories, and games. [1]

1. ARISgames.org

By placing text, sound, images, and video strategically onto an interactive global positioning system (GPS) map, students can build a wide variety of placed-based interactive projects. For example, one student group infused the UW-Madison campus with local stories of the feminist movement, while others created a tour of local effigy mounds. In addition to the deep historical affordances of GPS gaming, I discovered that ARIS allows students to reflect on the structure of narrative as they construct games, giving them a visceral sense of the architecture of stories through a tangible movement-based experience.

Experimentation with new media platforms almost inevitably involves risks and challenges. One of the major challenges of teaching ARIS is having technical support for students as well as access to software and laptops. Classes at the University of Wisconsin-Madison can be large; introductory-level English classes are often 350 students. This poses a challenge to instructors who want to incorporate digital tools and experimental media into their courses. While students can easily buy or borrow novels or literature collections to read for class, it is more challenging to support student access to and learning in digital platforms, especially in large lectures. Can students access the software on their own laptops? What if the students don't own laptops or tablets? What happens if students encounter technical difficulties along the way? Perhaps most important, do students really learn about writing and narrative structure from using experimental tools in a humanities classroom?

My adventures in ARIS began in the fall of 2013, when I was the lead teaching assistant in a undergraduate English course at UW-Madison titled *Stories, Maps, and Media: Designing Wisconsin Experiences.* Taught by English Professor Jon McKenzie, the course asks students to explore the past, present, and future of Wisconsin through the intersection of historical archives and emerging media forms. Learning goals for the students included:

1. Understanding digital communication skills through design frameworks;
2. Learning analytic and synthetic methods for thinking and living in the 21st century, while contributing to the Wisconsin experience.[2]

Early in the semester the students became familiar with design concepts and principles of experimental historiography by analyzing maps, graphic novels, and university spaces through the lens of user experience, experience design, information architecture, and information design. They also learned about varied approaches to telling/creating histories of a place. For example, a preservationist approach to history freezes the dominant cultural narratives of a place, "preserving" these stories. A critical approach to history asks more questions about the events and the perspectives through which they are told, often questioning pervasive cultural narratives such as Manifest Destiny or Columbus's discovery of America. In this particular class, we asked our students to remediate five Wisconsin events into games. The five Wisconsin history events that the students could choose to transmediate, or retell in a game format, were: Black Hawk Wars, the history of the Native American Effigy Mounds, the Pail and Shovel Party, Earth Day, and Wisconsin Idea. During this six-week project, students were required to build experiences in the form of an ARIS game, create a demonstration video of their game, and build a website that explained the design choice, creative process, and historical approach to their game. By doing so, students learned to think about the ways that historical events are curated, mediated, and designed for historical and educational purposes. In

2. McKenzie, J. (2001). Towards a Sociopoetics of Interface Design. *Strategies, 14*(1), 121-138.

particular, by creating stories that are situated in space (on a GPS map that pops up as the user gets near the "object"), the designer sees the component parts of the narrative arc and understands the effect of the story design on the user.[3]

PLATFORM DESCRIPTION

Though partly serendipitous, ARIS was a good choice for this class project for several reasons. ARIS is a user-friendly, community-supported tool that has advanced possibilities for both game-design experience and gameplay. ARIS is a free, open-source platform, which makes it a feasible tool in a large classroom setting. Students can easily access and build in ARIS on their own laptops (PC or Apple) or use computers in the university media labs as long as they have access to Wi-Fi. In order to play the game, students must have access to an iOS device, that is, an iPhone, iPad, or iTouch. By using a combination of story elements and GPS mapping, students can create a locative, augmented reality experience. Fictional, historical, or theoretical content can be dragged onto a specific location on a map (an image or video of an Indian mound placed on the map in Madison, Wisconsin, for example). This content then appears to the user/player on her iOS device when she is within about 30 feet of the mapped content (distance is adjustable). The text, image, and animation on the screen project layers of meaning onto a particular space, thus transforming a seemingly static spatial environment into a kind of palimpsest. This makes abstract ideas or histories immediately experiential and relevant to the user. One student game based on the Black Hawk Wars allows the user to play the game from multiple perspectives (see Figure 1). These new learning outcomes create an absorbing and dynamic classroom experience that inspires students to become active producers of knowledge.

3. ARIS was, and continues to be, developed at UW-Madison by the GLS and Mobile Learning Incubator led by David Gagnon.

Figure 1. Screen and description of game about Black Hawk Wars.

The first screen of the game or documentary often gives the player a task. For example, in one of the student games a native "guide" pops up and tells the user about the history of destroyed Indian mounds at the university. The guide then asks the player to gather information from other characters about the effigy mounds that lie underneath many of the university buildings. As the player moves around the physical campus gathering information, he or she can save information in an inventory or backpack. These objects may be historical documents, food, or information "found" along the way. The information or objects gathered can then be traded for points or for other information to end the game, or the information can be used to create a larger project outside of ARIS (e.g., a research presentation on mounds culture).

WHY GAMES IN THE HUMANITIES?

English as a field has long struggled with ways to make writing more engaging and relevant for students who are not inclined to write traditional academic essays. Hands-on building and game design provide new ways for students to think about story structure and historical perspective in an interactive learning environment. Student designers can create linear experiences in which a user must go from A to B to C and so on, or they can create a more random or chaotic experience, so that the player might encounter various events or characters simultaneously as he or she wanders around a designated location. The malleability of experience design in ARIS, or the overall look and feel, structure, and goals of the game, gives students creative jurisdiction over several aspects of the

game that they build. The possibilities or affordances of the platform allow designers/students to pay detailed attention to the ways that cultural narratives are created, implemented, and sustained, as well as to the learning outcomes for the players (end user). Likewise, the writing in this project is directly relevant to the outcome of the game: in addition to writing the game instructions and dialogue, students craft a lengthy proposal in which they must convince their "client" that the game they create is pedagogically relevant to their users (this could be elementary school students, city tourists, university students, etc.).

Stories, Maps, and Media, a college-level English course, asked students to explore intersections of visual, textual, technical, and conceptual elements in various story genres. Through the reading of designers and media theorists such as Edward Tufte, David McCandless, Marshall McLuhan, Jon McKenzie, and Ralph Appelbaum, students were able to practice media analysis as well as apply design concepts in small weekly assignments.[4] The aim of the design framework was to get students learning analytic and synthetic methods for thinking and building media in the 21st century while contributing to the future archives of Wisconsin history. While this project might seem primarily like a historical design project, it incorporates media and design paradigms from graphic novels, experimental theory, performance studies, and media activism. The students collaborate on the experience design of their project, deciding whether it will preserve, critique, or inspire alternate Wisconsin histories.

In order to create a systematic and consistent framework through which to engage the media, students were taught the design framework of experience design, information design, and information architecture to both critique and produce media. Experience design is a field used to create audience or user-centered interfaces or experiences in order to facilitate the building of specialized environments.[5] A tangible example of the results of experience design is The Wizarding World of Harry Potter in Florida. Designers from around the world created streets that mimic those described in J. K. Rowling's novels to give the visitor a visual and kinesthetic experience of Hogwarts and its environs. This includes the look and feel of the spaces, the sounds, the smells, as well as the navigability of the museum itself. These frames in the context of our English course gave students the ability to think about the structure and hierarchy of information in their project, the look and feel (or tone) of their game, and the user's moment-to-moment experience. In short, the course sought to push students to use media design tools to think outside of traditional historiographical tactics and to use innovative transmedia storytelling techniques in order to intervene in larger social and educational problems.

I decided to use ARIS as an experimental media form through which to imagine an alternative history for the future archives of Wisconsin (through the five historical events listed earlier) for several reasons. First, as far as I knew, the ARIS platform had never been used in a college English

4. Other titles among these works include Norman's The Psychology of Everyday Things and Wurman's Information Architects. Tufte, E. (1997). Visual explanations: Images and quantities, evidence and narrative. Cheshire, CT: Graphics Press; McCandless, D. (2009). The visual miscellaneum: A colorful guide to the world's most consequential trivia. New York, NY: Harpers; McLuhan, M. (1967). The medium is the message. London, England: Penguin Books; McKenzie, J. (2001). Towards a sociopoetics of interface design. Strategies, 14(1), 121-138; Appelbaum, R. (1997). Untitled essay. In R. S. Wurman (Ed.), Information architecture (pp. 150-161). New York, NY: Graphis; Norman, D. (2002). The psychology of everyday things. New York, NY: Basic Books; Wurman, R. S. (Ed.). (1997). Information architects. New York, NY: Graphic.

5. Within the experience design framework (developed, in part, by Donald Norman), information architecture focuses on the hierarchy of information (usually attributed to Saul Wurman) and information design focuses on the look and feel or aesthetic experience of the user.

classroom and held untapped possibilities for narrative design with which I was eager to experiment. In addition, though ARIS is used all over the world, it was first developed at UW-Madison; thus, we had exceptional resources, including close contact with the game designers. Third, gaming has become a more visible pedagogical tool in the humanities, and we were eager to think about the ways that we could expand game affordances for literary purposes.

GAME PROJECT AND DELIVERABLES

As the syllabus was already set, I had about six weeks to implement the ARIS project. The course was structured so that there were two 50-minute lectures a week along with small discussion-section meetings once a week. Because not all of the students in the class were creating games, lectures did not cover the game interface or ARIS design process. This meant that my students had only six 50-minute classes in which to complete all of the components of the ARIS game project. I also expected students to spend a fair amount of time outside of the classroom researching, compiling information, and producing materials with their groups.

The ARIS project has several component parts (these components could be scaled down for younger students). The five deliverables were: 1) a team website; 2) the ARIS game; 3) a three-minute demonstration video of the game; 4) a formal 2,000-word project proposal explicating the intended audience, the user for the game, the overall user experience, information architecture, information design, and conceptual intervention of the game (way that the game remediated history); and 5) a five-minute formal presentation of the game. The student teams were assessed and graded on each of these deliverables.

In order to produce these assignment deliverables, students were first required to visit a local archive (Wisconsin Historical Society) and gather historical materials related to their topic. Second, they were expected to research and identify a problem within their topic; for example, one team asked: How can we make visible the destroyed and hidden Indian mounds on the university campus? Third, students brainstormed game ideas that might intervene in the problem or issue they identified (also known as ideation). They usually did this by storyboarding on a large sheet of blank paper. Fourth, they built the ARIS game using both found and custom-designed media pieces (short videos, music, dialogues, etc.). Fifth, students wrote and illustrated a robust 2,000-word proposal document explaining their game, the historical problem they were addressing, and their design approaches. Sixth, they made a short video of their game for presentation purposes. All of these materials were housed in a website that was created by the group or "design firm." Though this chapter focuses primarily on the game design, it is important to know that each of these assignments complemented and built upon one another.

To begin the process, my section of 20 students broke into five teams that would role-play as design firms. Students divided themselves into groups according to topic interest. For example, one group coalesced around its members' interest in Pail and Shovel, the UW-Madison absurdist student government party from the 1970s (see Figure 2). By creating a mini-community within the classroom, students took responsibility for the project in a way that rarely happens in the literature or writing classroom. The process of community building happened, in part, through the group's creation of a team name, website, logo, and design scheme.

Figure 2. Red Flamingo's team introduction.

The design framework was crucial to the building process as groups thought through the conceptual and aesthetics of their group site and game. This process allowed students to use the design concepts they learned earlier in the course.

They were asked to create a consistent look and feel across their five deliverables so that the site and proposal would coalesce with the ARIS game they would produce. To do this, the teams were asked to articulate the kind of historical narrative they wanted to tell: Would a team choose a fun and light presentation for their historical event? Or might they create a postmodern, monumentalist mashup game in order to overturn the very concept of a fixed history?

To facilitate a smoother group process, each team member was asked to take on a specific role. In our case, the roles included:

1. A producer to keep a schedule and hold the other members accountable for deadlines,
2. A copywriter to generate and edit proposal materials,
3. A designer who would be responsible for the design of the game and the visuals, logos, color scheme, images for the website, proposal, and game
4. A software "specialist" or website creator/game builder/video maker.

Sometimes students decided to share roles or create new categories that better fit their needs. All group members were expected to work together on writing the proposal and conceptualizing the game.

TIMELINE FOR BUILDING

The game-implementation process took about four weeks (meeting once a week for 50 minutes).

We asked the UW-Madison Software Training for Students (STS) organization to give students "just in time" training, which means that a small amount of immediately relevant information about the platform is given to the students in each class period. More information is given to students as required to take the next steps in the game-design process. This approach ensures that as students learn about the game editor, or back end, they also practice the steps that they are taught along the way and thus are better able to retain the information within a kinesthetic practice.

For the first ARIS training class, the software trainer taught the students how to log into the ARIS site, how to begin a new game, and how to create and drag characters, items, and plaques onto a GPS map in the Editor or authoring tool.[6] Before training began, I asked students to play some of the existing ARIS games, so that they became familiar with the platform and its affordances. This first week, we asked each student to create a "throwaway game." This sample game was a way to get students working inside the platform with low stakes. For this exercise, students mapped five or six significant people and places onto a map of their hometown in the ARIS platform. Some students mapped significant events and people from their childhoods; others mapped short fictional stories onto their hometowns.

The second week in ARIS, teams were asked to come to class with a list of characters, items, and plaques that they thought they might use to create their game narrative. During this class, groups were given note cards on which they wrote the names and descriptions of these characters, items, and plaques. They then used the cards to create a storyboard by placing the cards on a large sheet of paper. The storyboarding exercise allowed them to draw pathways, create alternate routes, and experiment with narrative trajectories for the game they wanted to create (see Figure 3). Ideally, students would create three different storyboards in each group, and then discuss or workshop the ideas with the whole class, getting feedback and suggestions, and finally choose the most viable or exciting sequence for their game. During this exercise, students were asked to think about the user experience of the game and the overall experience design. Could the user/player easily navigate from one step to the next? Was the learning outcome being leveraged within the game narrative? How would this narrative game intervene in the issue or problem that the group had identified earlier?

6. The first time I taught ARIS, I had David Gagnon and John Martin two of the game designers, and a university technical support trainer in my class helping the students. Not everyone has access to these resources, obviously. But there are other ways to get robust support while learning or teaching the game. For example, students used the ARIS Google Community Group on the ARIS.org website for live support, tips, and problem solving as they advanced in the game-design process. These resources are growing all the time and have become more refined even in the last year.

Figure 3. Storyboarding with narrative elements.

For the third class (their third week building in ARIS), students came to class with the game already partially built according to the narrative trajectory of the storyboards they had created the week before. The elements (items, characters, plaques) had all been placed on the map, and teams began to bring in media files (videos, music, images, etc.) to supplement the experience design of their games. During this session, the software trainer introduced the students to requirements, which allows them to sequence their game elements in a specific order. The teams spent about 25 minutes of class time working on requirements within their newly minted games—with technical support nearby in case they needed assistance with advanced requirements.

The fourth and fifth classes were spent in a combination of building and critique or peer review. These classes were extremely important to the quality and depth of concept in the games. By the fifth class, first drafts of the games were due. At this point, each group was asked to present its game to other groups for feedback on concept, structure, and design. Students spent about five minutes demonstrating the game to another group on an iPad and then received five minutes of feedback based on the experience design framework (see Figure 4).[7] We asked the reviewers to write their comments on note cards in the last two minutes of each 10-minute peer-review session for the designers. This way, by the end of the peer-review class, each group had several concrete suggestions for game editing. Teams then made final revisions for the last class period. Each group was able to play the other teams' games during the final class period and write assessments of the games using the CAT (conceptual, aesthetic, and technical) or UX (user experience, experience design, information architecture, and information design)frames to guide their critiques.

7. The designer can activate a quick travel function in ARIS so that the players can choose to "travel" to a location without actually moving around in real space.

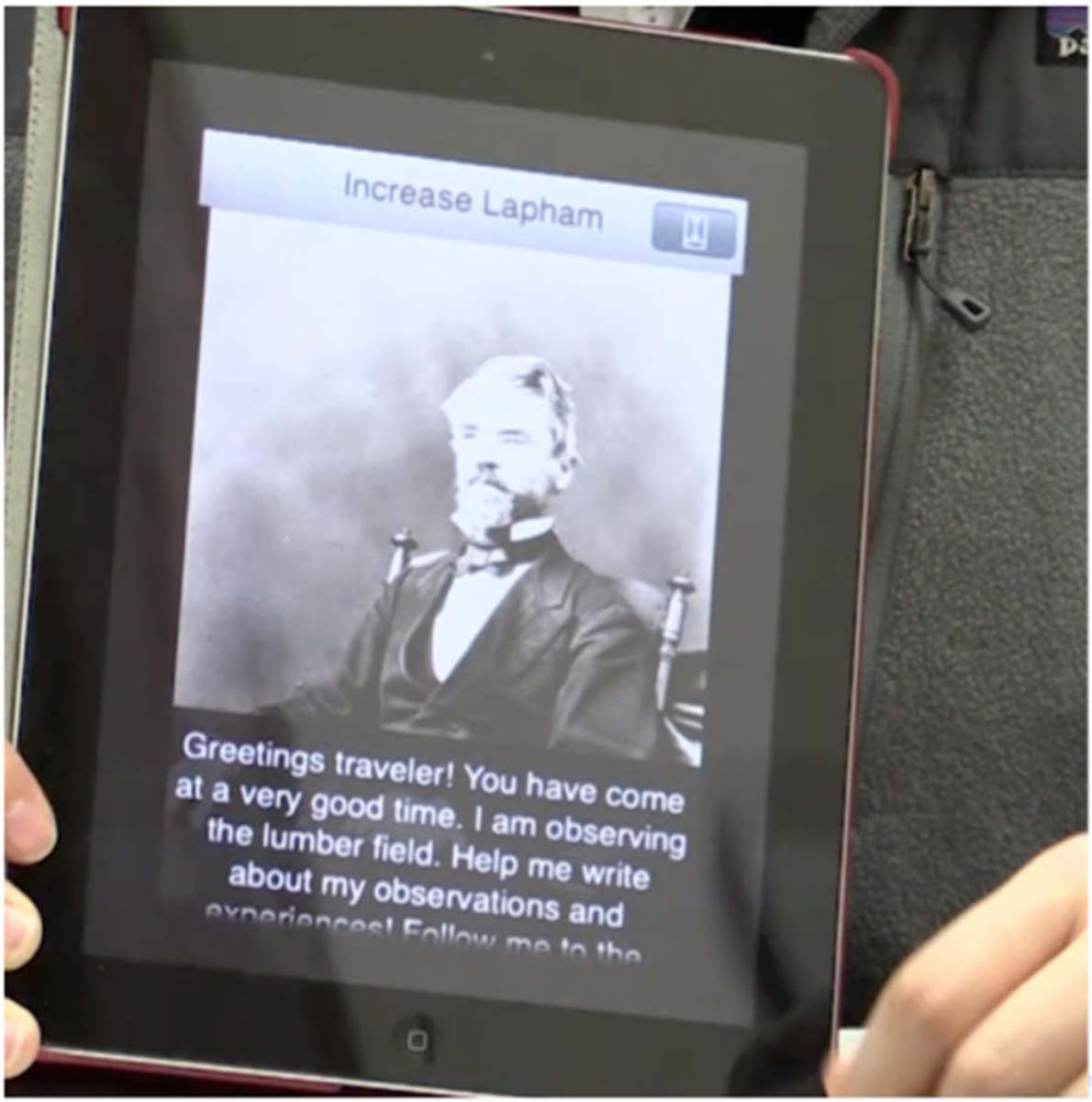

Figure 4. Student demonstrates a game based on Earth Day.

The importance of the design framework in this project cannot be overstated. Though it is possible to build games without using the design frame, we found that the design vocabulary, attention to aesthetic details, and conceptual foundations of the games were greatly enhanced when using the user experience lens. By thinking about the experience of gameplay from the users' point of view, students were able to analyze the ways in which the interaction of text, image, ease of play, and narrative arc worked to create an overall learning experience for the user. The designers became especially attuned to the impact of the visual elements or the look-and-feel of the game. For example, the team that created a situated documentary game about Wisconsin effigy mounds decided on a color palette that would reflect the natural environment of the mounds (see Figure 5). In contrast, the Pail and Shovel group chose a much lighter aesthetic design for their game and proposal, communicating the parodic or comic tone of their topic (see Figure 6).

Figure 5. The natural environment of the effigy mounds is reflected in the design choices of the Salvation of the Mounds team.

Figure 6. Front page of Red Flamingo's proposal, showing a lighter tone.

REFLECTIONS ON TEACHING ARIS

Overall, the game-building exercise was a success, assisting students to identify structural narrative elements, learn software skills, create products for their growing portfolios, and learn the skills of creating and pitching ideas to a specific audience. The cultural cache of game building and the added bonus of inviting friends and family to play and "review" the game on the ARIS platform created a buzz around the game both at the university and at home. Students tended to get excited about game building in general, whether they were avid gamers or new to the field. Several things could have been improved in the planning process, however.

First, the schedule for the game was too tight. According to the ARIS designers, this was the first time instructors had tried to teach ARIS in five short 50-minute blocks of time. Because game building requires tinkering, collaboration, and reiteration, this short time period (essentially about four hours of class time) was not conducive to these rhythms. As a result, several students were overwhelmed

by the amount of work that went into this project. In retrospect, we would have benefited from more in-class time to play, experience, and build games. Ideally, students would have had time to play and assess ready-made ARIS games for at least a week before the design process began. In addition, students would have benefited from longer blocks of time for game designing and building (1.5 to 3 hours at a time).

Probably the most daunting aspect of teaching ARIS in the classroom—whether it be in an elementary school or in a university—is the fear of technical complications or lack of technical ability. However, a robust ARIS support system exists online to assist institutions without technical support staff. The ARIS site has accessible online user guides, how-to videos, a sharing forum, and an online support community (Authors Forum) for fielding questions, making ARIS a viable tool to teach in the classroom. Because the Authors Forum support group consists of international users, questions are often answered within an hour or two of the posting—even late at night or early in the morning. The most comprehensive user guide on the ARIS site is *Creating Narratives With ARIS,* a PDF manuscript that can be downloaded or viewed online at the ARIS site. This document walks through the basic layout of the back end, or Editor, of ARIS and explains how to place items, plaques, and characters on the GPS map. If you prefer to watch videos or want to give an introduction to getting started in ARIS to your class, you can watch the video *Authoring Basic Objects* or *Using Requirements.* New learning and teaching tools are constantly being created and reworked for a friendlier user experience, so names and video may change slightly. More recently (as of Fall 2014) the Beta version of ARIS has become available, along with several excellent how-to videos posted on the site by Chris Holden (University of New Mexico). More and more educators are learning ARIS and thus making the teaching networks more closely connected (and making it more likely that you may be near an experienced ARIS builder), these online support tools are extremely useful for a first-time user/teacher.

OUTLINE: STEPS FOR GAME FAMILIARIZATION, DESIGN, AND IMPLEMENTATION

1. **Familiarization**. Give students an introduction to games/place-based learning and let them play some ARIS games. Allow class time to discuss the games and their perceived successes and failures.
2. **Teams**. Create design teams around a predetermined topic. (This could be a historical event, a person, a critical theory, or a research question.) In the upcoming weeks, teams can create websites, logos, and design-team statements.
3. **Research Group Topic.** (This can be done during class time or outside of class). Depending on the subject matter, students can do research in books, online, or in local archives.
4. **Technical Proficiency**. Introduce basic ARIS process: editor, map, objects. Ask students to create a "throwaway" game by mapping some characters and items onto their local area. Be sure to encourage students to use support networks on the website.[8]
5. **Storyboard**. Ask each team to bring in or make 10-15 note cards describing characters, items, and plaques that they would like to incorporate into the game. Students can use these cards to experiment with various narrative sequences on a large sheet of paper. When they agree on a sequence, they can glue the cards in place and write notes on the paper.
6. **Implementation**. Students can use their storyboards as models to build their game. At this

8. ARISgames.org

point, more software training may be required. Several short how-to videos and guides are available on the ARIS site to help with this process.

7. **Redesign**. Have students play the other teams' games and give feedback about the interface, user experience, look and feel, and end goal of the games. Teams should redesign their game using peer and teacher feedback (as useful).
8. **Assessment**. Have students assess both their own games and other teams' games using the experience design framework. You may also ask them to assess the work of each of their team members at this point.
9. **Publicity**. Have students ask parents, family members, friends, and other teachers to play and rate their games (ARIS allows players to rate and comment on games).

Note: The above outline does not include the design frameworks, which were taught before the ARIS project was introduced to the students. These design concepts—experience design, user experience, information architecture, and information design—were central to the success of our projects.

CONCLUSION

Because of student enthusiasm for ARIS and for its exciting possibilities for classroom teaching, I taught ARIS in four subsequent courses and even introduced it as a classroom tool to regional high school English teachers. Not only is game building and designing exciting for students and teacher alike, but it also facilitates community building in the classroom, teaches media skills, design confidence, an understanding of narrative structure, critical thinking, and writing skills. Perhaps most important, it gives students a rare opportunity to participate in the process of knowledge production. As they create these mini-knowledge machines (games), students are cognizant of the learning outcomes for the game users/players. We found that student designers pay particular attention to the ways that the story structure (the narrative development/divergence, the pathways of the game, the conceptual architecture) and the design elements of the game (sounds, images, colors) affect the structures of knowledge within the game, the story arc, the affective augmented environment of the player, and the learning outcomes that result from these combination of choices. As students craft stories and experiences for other users, they are able to reflect on the historical and narrative processes that affect the ways they think about and perceive the world around them.