

Chapter 27

“I Just Don’t Know Where to Begin”: Designing to Facilitate the Educational Use of Commercial, Off-the-Shelf Video Games

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Abstract This chapter documents the process and preliminary results of a two year project in which a team of MIT researchers, in close collaboration with local educators, designed and tested supplemental teaching resources for supporting educators in implementing the use of commercial, off-the-shelf games in their secondary level, humanities (e.g. social studies, history, languages) classrooms. The chapter also provides an overview of similar research in the field of game-based learning and addresses challenges likely to be encountered in such implementation processes, particularly in the American public educational context.

Keywords Commercial off-the-shelf games • Co-design • Curriculum design • Humanities education • Secondary education • Research documentation

27.1 Introduction

“I am not a gamer” are often the first words spoken by the teachers we approach for using games in their classrooms. “But my kids are!” Continued conversation often reveals a teacher’s passion for puzzles, board games, and other playful digital and non-digital experiences the teacher was not categorizing as games. Confessing a desire to use games as part of a larger set of instructional strategies is likely followed by yet another disclosure: “I just don’t know where to begin.”

In the fall of 2013, the Massachusetts Institute of Technology’s Education Arcade research laboratory submitted a proposal to a private research-funding entity, the Arthur Vining Davis Foundation, requesting support to explore the use of commercial, off-the-shelf (COTS) digital games (also appearing here as video games) in upper secondary, humanities classrooms. At the time, there was a significant amount of research being conducted around the use of learning games in

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STEM (science, technology, engineering, and math)-based classrooms and informal learning environments at all levels – primary (known in the American system, the designations of which we will use throughout this chapter, as elementary), lower-secondary (middle), and upper secondary (high) school. Yet, two key components were missing from the equation – the use of commercially popular games (versus games specifically designed as educational) and a focus on the humanities. We sought to tap the potential of commercially successful digital games for learning. In particular, we planned to facilitate widespread, effective use of commercial games to support learning in high school literature, history, and civics classes and contribute to research that explores how learning occurs through gameplay and identifies the best classroom practices for achieving desired learning outcomes. We proposed to conduct the work in five phases:

- Researching and assessing best practices among high school humanities teachers who are already integrating popular commercial games into lesson plans
- Developing multimedia professional development resources informed by best practices, including model curricula that integrate select commercial games and are linked to national educational standards
- Piloting and assessing the first iteration of the professional development and curriculum materials with classroom teachers during the second year of the project
- Revising materials based on pilot outcomes
- Disseminating the materials nationwide via relevant professional conferences relevant print and digital media outlets

Due to ongoing local and national policy conversations regarding the Common Core State Standards, which aims to maintain a national (rather than at the individual state level) set of criteria for and model of public education learning outcomes around the need for a greater emphasis on deeper, critical skill learning, we decided to focus our research and development efforts on developing activities and professional development resources that would support these emerging standards. Drawing on research in the field and our own experience as game researchers and designers and developers of effective games for learning, we hoped to identify and select popular games that might:

- Scaffold complex systems, allowing learning to build understanding incrementally through trial and error
- Include opportunities for collaborative learning and team play
- Model hypothesis testing and model-based reasoning
- Embed learning in a compelling narrative that engages students and motivates them to persist in the game when faced with challenging obstacles
- Provide multiple paths for problem solving to accommodate multiple learning styles
- Provide ongoing feedback and rewards that allow student to continuously monitor their own progress and motivate them to keep trying despite initial failures

In this chapter, we discuss how prior research affects our current work via a brief literature review of the use of COTS games in classrooms, with emphasis on secondary and/or humanities education, as well as other approaches to scaffolding teachers’ use of specialized curricula around games and other media. Beyond this literature review, this chapter serves primarily as a full documentation of our project, from our research site’s curricular context and other constraints and our specific methods to the ways in which our research goals changed over the course of the project’s 2 years. Although this documentation is deeply situated in the specificities of our project, we present it as a methodological frame, with reflections upon such a methodology and the issues that arise within and around it, so that this documentation may be of use to other researchers and educators who aim to address similar issues in a wide variety of contexts.

27.2 Literature Review

27.2.1 *Technology in Schools/Curricula*

Educational research has often focused on the video game as a location for learning, such as James Paul Gee’s description of video games as learning environments where learners explore through trial and error and at their own pace (Gee 2013). This trajectory of research into these kinds of digital games examines the qualities of computer and video games, what kind of “good learning” occurs through the play of “good games” (Gee 2007). That said, Gee identifies that it is not enough to use games in school but to make learning more “game-like,” not via the form of games but rather the learning principles used “when and if they are playing . . . reflectively and strategically” (Gee 2007). In this mode, game play is an experienced, situated learning as learning occurs within the moments of play by, guided by the game through in-game scaffolding such as level design, tutorials, and difficulty levels (Gee 2004). If school could be like games, Gee argues, then all learning would be more situated within appropriate contexts: students would put on professional identities (e.g., scientists). The (game) play is important here as a means for eliciting these identities, while the teacher (or someone or something else) would guide the learner in appropriate activities.

Previous research into using games for learning in formal educational contexts has been either in the development and use of custom games for specific content needs (Jenkins et al. 2003; Ray et al. 2013; Jong 2015) or the use of existing COTS games (Squire 2005; Steinkuehler 2007; Wiklund and Ekenberg 2009; Miller et al. 2012; Gerber et al. 2014), often originally designed for entertainment rather than education (Sandford et al. 2006). The typical school as described by Jenkins et al., i.e., the school that uses digital gameplay in the classroom and embedded throughout curriculum, has come to fruition in some locations (Tekinbaş 2011; Dikkers 2015) but is facing a number of challenges as the practice spreads and is adopted by

educators (Groff and Mouza 2008; Takeuchi and Vaala 2014; Admiraal et al. 2014), especially in various transnational contexts (Hainey et al. 2013). Games are judged on their appropriateness to the content in varying ways but often based on whether the specific gameplay within the game fits the learning needs or researchers are met with teachers with varying perceptions of using games in the classroom (Gerber and Price 2013; Mifsud et al. 2013; Dickey 2015; Sáez-López et al. 2015).

27.2.2 Limited Aspects of Educational Content

Other strategies to integrate COTS games in classrooms have appeared in recent years (Charsky and Mims 2008; Charlier and De Frahne 2012; Bourgonjon et al. 2013; König et al. 2014). Indeed, in the previous volume of *Serious Games and Edutainment Applications*, authors Kae Novak and Rurik Nackerud outline an adoption model for evaluation and implementation of COTS games in curricula. Their focus was in evaluating games based on immersion – how focused were the gameplayers on their own gameplay (Novak and Nackerud, 2011) by creating a rubric that connected the concepts of flow (Csikszentmihalyi 2014) to motivation (Keller 1967; Malone and Lepper 1987) while also considering ease of use for the students (Novak and Nackerud 2011, p. 301). This rubric is designed to find games that would prove enjoyable to play by students; only one of the six qualities tracked for the games connected to educational value, whether the game is applicable to learning objectives (p. 300). It also assumes a particular mode of game use: to play as it was intended, rather than in a subversive or critical mode, playing around and between the boundaries set by the game (Flanagan 2009). That said, they identified a number of types of learning that similar games could be connected to, not just in STEM content categories but also in humanities (history, language arts) and business (Novak and Nackerud 2011, p. 305).

This model situates the game as a lens through which other activity occurs, rather than the focal point of the lesson. The following are such other activities that we explored in our pilot sessions (described later in this chapter):

- Group simulation games and “role-play”: pinpointing how group decisions are made
- Narrative games and “detective play”: overhearing conversations to provide writing prompts
- Fiction and world building as a means to understand history
- Motivation and alternate means of expression
- Inspiring curiosity through counterfactuals

In the cases described in the literature, games are directly oppositional (at least as a class activity) to the rest of standard curricula, and games are not played in the same manner as they would be in self-directed play. Game play is situated within constraints of the classroom, and for this, we needed to more deeply consider how specific classrooms lead to particular constraints.

27.3 Research Methods and Process

The proposal for this 2-year project was generated in the fall of 2013 and commenced in the fall of 2014. We assembled a team including the principal investigator, a project manager, and two graduate student research assistants enrolled in MIT’s Comparative Media Studies and Writing Program. At the beginning of the project’s second year, two MIT Game Lab instructors with professional interest in gaming and the humanities joined the team, replacing one graduate researcher upon graduation.

It was our hope that we would not only create stand-alone lesson plans that high school humanities teachers might use in their own classrooms but to develop a framework that teachers and educational technology coaches might use to design their own game-based learning activities based on their own learning goals. To this end, we knew it would be important for us to be working directly and codesigning our research with a few local area (metro Boston) school districts. We reached out to a few local school districts with varying degrees of success, due to conflicting academic and accountability pressures, time, and research fatigue. In the end, we formed relationships with two school districts: Lynn Public Schools (Years one and two) and Wakefield Public Schools (Year two). We worked with the administrative team from Lynn Public Schools in a codesign model incorporating input from key stakeholders including teachers, educational technology coaches, and district-level curriculum and instruction administrators. The relationship with the Wakefield Public School District was teacher driven and then incorporated school and district administrative support.

Over the course of several months, we met with members of the Lynn Public School District administrative team, outlining our objectives for the research, expectations for participating schools and teachers, and a process for moving forward. Lynn Public Schools provided a unique opportunity for us to engage with a diverse local school district that also operated four schools serving varied student populations, representing traditional college-preparatory high school curricula, a vocational/trade school curriculum, and an alternative, combined middle/high school experience supporting at-risk (i.e., underperforming and/or underserved) students. Meetings with district-level curriculum and instruction administrators addressed administrative concerns while also identifying opportunities to collaborate with specific teachers across the four schools. During these conversations, we asked many questions of school and district administrators that helped us to define design constraints and priorities from the district’s perspective.

After setting priorities (discussed in greater detail below) with the district-level staff, we spoke with each of the school principals individually. Again, we outlined our research goals and objectives and expectations for school participation and discussed the process for moving forward. In addition, we asked principals about their hopes and their concerns, which always reflected the priorities outlined at the district level. Each principal then worked with their team and the district office to identify which eight teachers would participate in the project as codesigners.

The eight teachers selected to participate in the project did not necessarily identify as game playing or as deeply familiar and comfortable with technological tools, although some were both or either. Teachers were selected and opted to participate via their willingness to try new things in their classroom. For some, this willingness came from a supposition that games have a potentially powerful role in the classroom. But for most, that willingness came from an ongoing desire to identify and use instructional strategies that motivated students to engage more deeply in their classroom and curricular content.

27.3.1 Research Design

The project was conceived as design-based research initiative with the eight teachers noted above serving in the role of codesigners. That being said, we also needed to manage and limit the level of time required by participating teachers. As a result, we opted to focus the collaborative design work of the teachers specifically on the development of lesson plans that could be developed and implemented within the 2014–2015 and/or 2015–2016 American academic years (which run from late summer to early summer, around August to June). Through this narrow focus for each of the teachers, we hoped to yield several key pieces of data, including generalizable lesson plans, specified design constraints and implementation strategies, and documentation of the design and planning processes.

With this understanding, the team drafted a research and design plan for working with teachers to codesign lesson plans or units of study that would uncover the aforementioned data while also building teacher capacity to design their own game-based learning instruction. To do so, we used four data collection methods to support the design, implementation, and evaluation of the lesson plans.

Phone interviews served as preliminary explorations with teachers who were already using game-based learning in their classrooms. We undertook these early in our research to uncover teachers' style, content focus, instructional objectives, and game-playing experiences as well as that of their students so that we would have a greater understanding of what worked in game-based learning-enabled classrooms and what might onboard teachers into such inclusions in their curricula. Other phone interviews were conducted with administrators from area school districts, professional associations, and state educational offices. Finally, we created a survey, and from there, we created and distributed an online survey, which invited high school humanities teachers nationally to respond anonymously online. The tool collected information about age levels and subjects taught, required texts within their curricula, any flexibility in instructional design, time constraints, experiences playing games, and logistics-oriented questions about technology and school-day structures and resources that might serve as design constraints.

Our longest running and most important method was classroom observations. These provided a structure for observing student and teacher activities for in-class play and addressed specific categories of the experience, including task comprehension, game/technology usability, student affect, and teacher and student

engagement. They also required navigation of the hurdles for getting games into particular classrooms, which allowed for a situated understanding of what some of those hurdles might be. We also collected student work generated during these classroom pilots. That work included classroom conversations and any homework or in-class assignments, to be examined in terms of their connection to the game play and academic content, levels of engagement, and as examples of the specific content/skill priorities. For our final engagements in each iteration of the classroom observation, we conducted post-lesson interviews with the teachers in order to solicit feedback on how they might improve upon the process, the gameplay, and student engagement. Teachers also provided insight regarding whether the student participation and work products were typical of the classes observed.

As a research project with human subjects, our team was required to be trained in and abide by ethical human-subject research guidelines. Thus, we submitted the requisite documentation (a research application, informed consent forms from teachers, informed consent forms from students’ parents, and observation protocols) for review and approval by MIT’s Institutional Review Board, the Committee on the Use of Humans as Experimental Subjects (COUHES). This process took some time, during which we could not conduct the aforementioned research methods. We filled this time with other kinds of preliminary research, as described in the following section.

27.3.2 Preliminary Research

We began by researching the best practices among high school humanities teachers already integrating popular games into lesson plans. Our initial efforts uncovered a strong body of research, as listed in the literature review above. We sought to reach beyond this work and provide the field with a broader and “self-serve” tool or set of resources that would allow teachers in any of the humanities disciplines to design their own instruction using games, in much the same way that one might use any new text or media like popular fiction, film, documentaries, or popular television series. Thus, we brainstormed additional examples of how specific COTS games might support instruction in the humanities.

However, we had no content focus for our investigation more specific than “the humanities,” as we recognized that the learning goals, rather than particular games, had to take the lead in our attempts to narrow our focus. Indeed, “the humanities” is a large, unwieldy cluster that covers many disciplines, times periods, and concepts. Thus, we needed to immediately establish our conceptualization of humanities disciplines and our goals in supporting those disciplines in the classroom, as well as how to facilitate the implementation of that support on a large scale, as this was one of the primary objectives outlined in our proposal. Did it make sense to select a few required courses to ensure all students were covered? Or might it make more sense to focus on a few concepts or skills that had more universal application across multiple subject areas? Through researching current curricula and emerging standards in

high school humanities in the United States, we opted to focus on courses that all American students are required to take to meet high school graduation requirements (English, world history, and US history) to ensure that we might reach the greatest number of teachers and students.

This research consisted of our phone interviews and survey (as discussed in the previous section) and a cursory review of the programs of study and course offerings of select local public school districts. Here, we were looking to uncover whether there was a consistent course offering at the school and district levels in terms of topics, sequence, and required versus elective courses. For instance, all students must take 4 years of English. Yet, some variations exist between the structure and focus of the courses; some districts were offering traditionally tiered (i.e., remedial, standard, and honors/"gifted") course, whereas others offered English as part of a heterogeneously grouped, cross-disciplinary course taught with the history offering.

From here, we still needed to determine whether a consistent set of concepts, skills, or practices cut across these subject areas, particularly as educational models were shifting at the state and national levels. In order to contend with those shifts, which would also be of high priority to the teachers in our pilots, we examined the Common Core State Standards for High School English Language Arts and Social Studies/History. At the time, these new standards were in the early stages of adoption and implementation with significant and often heated public discourse regarding their potential impact on instruction. States, districts, schools, teachers, parents, and students alike struggled to understand how the new standards might impact classroom practice.

In particular, we considered the English Language Arts standards for concepts, skills, and practices that might apply more generally to most or all humanities areas. We talked with district and school administrators about what they thought were important and/or difficult topics or skills to teach within those standards. This was crucial, as we wanted to target those areas deemed difficult to teach, where no or few existing instructional strategies have the desired effect, rather than using COTS games to support instructional areas where proven strategies already exist. These reviews and conversations resulted in the prioritizing the following humanities skills and competencies: critical reflection (thinking and writing), argumentation, systems thinking, and problem solving. We validated the list of priorities using the phone interviews and surveys.

High-level learning goals in hand, we needed to define how gameplay might play a role in achieving them. We generated a short, yet varied list of prospective games that held some promise for use in required English and history classes while also providing opportunities to address our prioritized skills and competencies. We hoped that this list would have a broad appeal, would account for classrooms that included a diverse set of learners, and would support multiple models of integration into the classroom.

Our interviews with teachers and other stakeholders revealed that teachers (and administrators) were having difficulty imagining what a game-based lesson might look like or how much commitment such lessons would require from the teachers. Were they capable of leading this kind of instruction? What kinds of student

outcomes might they observe? To address these questions, our team developed sample lesson plans to offer a few models of game-based instruction, as well as assuage any fears that we would not be considering all facets of lesson design and implementation as we moved forward.

27.4 Pilot Testing in the Classroom

27.4.1 Year One

As previously noted, our initial concept for this project was to work with a team of teachers to codesign and implement instructional units, refine these, and then develop resources to facilitate broad adoption of the materials. However, lengthy ethical research and school district approval processes, an abnormally treacherous winter that forced many school closings, and busy state testing schedules all conspired to delay this collaborative process, especially pilot testing of the instructional materials.

One enthusiastic Latin teacher was eager to push the initiative forward. Late in the 2014–2015 academic year, we designed and tested a lesson using *Rome: Total War* in three of the teacher’s Latin I classes over the course of 3 days in June, taking advantage of with the last 3 days of the academic year after the school’s final tests.

Planning began with an evening phone call between the teacher and an MIT researcher, which discussed the time frame for the experiment, the number and grade of the students involved, and the curriculum of the class. The students were spending their semester reading excerpts of Gaius Julius Caesar’s *Commentaries on the Gallic War*. The teacher described both the historical and linguistic curriculum of his Latin class; a game that was relevant to any subset of those overlapping domains would be appropriate for his students. Even a game about the mythology of Greece would be within bounds.

Although initial ideas gravitated a game about vocabulary and grammar, the phone call was key in revealing the teacher’s own familiarity with certain game genres. Specifically, he was fond of *Age of Mythology* (Ensemble Studios/Microsoft Game Studios) and generally familiar with strategy games. He was already using films such as Ridley Scott’s *Gladiator* in the class, indicating some tolerance of depictions of violence in the classroom. With the perennial popularity of Roman conquest in computer games, we agreed that this might be a fruitful lead to pursue.

However, the discussion also uncovered a technical challenge: The teacher only had access to one computer, an aging Windows PC connected to a Smart Board (a digitally interactive whiteboard) and the internet. While the school had large computer rooms, those machines were generally reserved for other classes, and the teacher was not hopeful about having an exception made for his class. Furthermore, we wanted to arrive at a solution that he would be able to use every semester and not have to rely on one-time solutions.

One possible solution would be an activity in which the students would jointly make decisions as an entire class. A turn-based game would be more appropriate than a real-time simulation. We would have two separate freshman classes, meeting for three sessions ranging from 45 to 90 min each. The school ran on a waterfall schedule, meaning we would be working with the same students at different hours on different days.

The initial phone conversation was remarkably fruitful for the effort. In about 30 min, we established clear needs and possibilities for the teacher, as well as learning about specific constraints that could be turned into a structure for the activity and gameplay rules. From this, we shared a Google Document to craft the instructions of the class activity, allowing both the teacher and our researcher to freely edit and comment. All subsequent discussion occurred through the Google Document or email up to the day of the playtest.

From here, we brainstormed specific games that might fit the needs of this class, from as broadly as genres/kinds of games about Roman civilization or mythology, language-learning games, and games more generally about organized martial combat to specific games or even particular versions or mods of games, like *CivCity Rome*, *Ryse: Son of Rome*, *Europa Universalis: Rome*, *Influent*, *Age of Mythology*, *Total War: Rome II (Caesar in Gaul Campaign Pack)*, and what would be our piloted game, *Rome: Total War*. Knowing the limitations of the computing resources available, we quickly filtered any games that involved significant 3D graphics or relied on fine graphical details for decision-making; the low contrast of the Smart Board in the summer sun would render such information practically invisible. We also avoided games that relied heavily on real-time decision-making so that students would have time to consider and discuss decisions before committing to them. We wanted to avoid the situation where the entire class would effectively be watching a single student play a computer game in the class.

Rome: Total War (Creative Assembly, 2004) emerged as a reasonable compromise and a promising solution. Unlike its sequel, the game was designed for an earlier generation of desktop computing and lower screen resolutions. While the *Total War* series is renowned for its 3D presentation of real-time military engagements, the games also allow players to focus entirely on turn-based national management and to automatically resolve military confrontations. *Rome: Total War* also provides players with a range of options at the very beginning, which would allow us to tailor the pace and difficulty of the campaign to meet the constraints of a three-session classroom activity.

Having settled on the game, we saw in *Rome: Total War* a suggestion for a role for the students. Since the game puts the player in charge of multiple military commanders, governors, and provinces, the class could act as the senate, the governing body of the Roman Republic. This concept proved extremely generative, and our team of researchers and teacher together devised a lesson plan: Students could nominate and elect two leaders (“consuls”) among their peers to enact national policy and military doctrine. Each consul would take a turn making decisions in the single-player game, while the other would keep mandates in check with the power of veto. Displaying the state of the Roman campaign on the Smart board allowed

the rest of the class, the senators, to advise, argue, and orate as they had learnt from historical texts. New senators would be elected as consuls after a few turns.

This arrangement neatly addresses the contradiction of trying to engage the entire class in a single-player game. Even as we planned to use *Rome: Total War* in the classroom, it became clear we could invite the students to play a different game, this one not with the keyboard and mouse but with politics and rhetoric. The digital game would simply serve as a catalyst for senatorial deliberation. Instead of glorious conquest, we would place the emphasis on the considerations and complications of public policy.

We examined and addressed elements of the digital game would not fit with our structure. For instance, *Rome: Total War* describes the player as the patriarch of a powerful Roman family, controlling territory on the Italian peninsula, allied with a powerful computer-controlled senate in the city of Rome. The in-game senate usefully offers “missions” to the player as a gentle invitation to follow the trail of recorded history. Since we wanted the class to think of itself as the actual Senate of the Republic of Rome (SPQR), what were we to do with this autonomous element in the digital game?

We settled on asking the class to treat the computer-controlled senate as a local city government that offered rewards for positive actions, e.g., the successful occupation of new territory. It made sense that the city would maintain its own town guard, which explained why it maintained its own autonomous army. Historically, a single senate commanded both the republic and the city of Rome. Fictional liberties allowed us to paper over the incongruity between our pedagogical goals and the systemic model within the game.

The Google Document evolved into a comprehensive curricular activity guide, with procedures for setup, elections, senatorial proceedings, civil and military decisions, and post-activity debrief. We fully expected that the document would change after having the opportunity to play the activity with actual students. Assumptions could be disproved, strengths could be reinforced, and steps could be streamlined. However, only an actual playtest would allow us to prioritize future edits based on actual observations.

Technical problems on the first day of the three-day playtest were unsurprising. We had provided the teacher with a redemption code that would allow him to download and install the game from Steam, an online store for digital downloads. While the classroom computer was certainly up to the task, the school internet firewall prevented the download of the game. Fortunately, we had an extra laptop with the game already installed, but it was unable to send video directly to the Smart Board. Rerouting the video cable from the classroom computer to the laptop resolved the issue.

While we expected the teacher to lead the class, these eleventh-hour problems were symptomatic of a root cause – the teacher was not able to actually install and play the game prior to the playtest session and thus had no opportunity to test it with the Smart Board. The MIT researcher and the teacher agreed to salvage the classroom activity by having the researchers operate the laptop, convey the rules, and explain senatorial procedures. This freed the teacher to participate in the class

activity as a Socratic mentor, listening to all the arguments brought by the students and introducing questions to probe their reasoning. The teacher also maintained his intended role as the commissioner of the consular election.

In the first day, both freshman classes took most of the class session just to get through a turn of gameplay. The consular elections took a great deal of time, largely consisting of students declining nominations by their peers. It soon became clear that any two students willing to actually take a leadership position would automatically be the first consuls. Despite its clumsiness, the election process felt playful with a lot of good-natured ribbing among the students about who might be the best dictator. It may have also helped the consuls feel confident in their mandate to decide on behalf of the class, because everyone else had clearly indicated their reluctance to take a leadership role.

This playfulness was quickly met with confusion. The very first turn of *Rome: Total War* introduces a large amount of new information with little context: military units, city budgets, and missions from the computer-controlled senate. However, all that information is provided in windows that occupy the majority of the screen and do not change until the mouse is clicked. This gave us the opportunity to explain each screen in detail and describe the options before the senate, as well as the possible outcomes of each decision.

Rome: Total War has a “fog of war” feature that hides portions of the world map at the outset. Moving troops, diplomats, and ships in to unexplored territory reveals cities, armies, and geography. In most playtests of this activity, the first actual decision of the consul would be to move one of their units as far as possible into the unknown or to send a diplomat to another town. This is a low-risk decision that the class found easy to justify and usually rewarded with a surprise that resulted in discussion among the students.

In both classes, the discovery of the Carthaginian navy off the coast of Sardinia or troops in Sicily resulted in a vocal eruption among the students. The teacher seized on the opportunity to connect the events of the game to the content of the class, asking questions like, “What is that island? Why is Carthage there?” Rome’s historical relationship with Carthage is both aggressive and memorable, and by dovetailing the momentary surprise with knowledge gleaned from earlier in the semester, the teacher could gain useful insight into what students had retained from their readings.

The next big surprise always occurred after a siege. When a Roman army successfully occupies an enemy city in *Rome: Total War*, the game presents the player with the option to occupy, enslave, or exterminate the population. Students responded differently to the sudden moral dilemma, some mathematically weighing the economic and political benefits of each decision, some arguing for the ethical ramifications while correctly suspecting that leniency would come with a game penalty. Some declared nihilistic intentions with glee, and some just sat back, amused at how seriously everyone else was taking the game.

This was a clear example of the varied freedoms that games give license to in a classroom (see Klopfer et al. 2009). Students felt free to play with their identity, to choose not to engage with the fiction, to coolly experiment with the ideas of the

game, and to adopt a losing stance. After the three-day playtest, the teacher noted that he was worried that the gameplay might overwhelm his pedagogical goals and that it was a pleasure to see students demonstrating their grasp of the material and engaging with it in a different setting.

27.4.2 Year Two

The second school year gave us the opportunity to iterate on the rules of the senate role-playing game, iron out technical problems, and run the test with different students. The teacher was also able to use the summer recess to familiarize with the subtleties of the game. Of particular concern for us was addressing the reduced agency students experienced when they were not consuls. Should we have them prepare speeches? Should we break them into discussion groups? Would homework be appropriate?

Our revision had the teacher entirely leading the session, with the MIT researchers simply observing. Technical issues were resolved by providing the teacher with a boxed copy of the game rather than relying on digital downloads. Noting the presence of Carthage in the game, the teacher wished to run the game with a cohort of juniors who had just read accounts of the Punic Wars. Between sessions, students would be given an assignment to write a few paragraphs proposing policy for the consuls to consider. We also proposed a separation of responsibilities for the consuls and more structure discussion.

Compared to the playtest in the first year, the juniors seemed less animated. The “improved” nomination and discussion structure seemed to dampen much of the spontaneity seen in the freshmen, stretching out the processes of election and discussion twice their duration. Consular terms lasted even longer, allowing fewer students to take the reins of the republic. The mid-semester schedule may also have introduced confusion about whether the game was intended to be playful or the first part of a serious writing assignment. This stood in stark contrast with the post-finals, low-stakes scheduling of the first playtest.

Despite these differences, students still showed a high level of engagement. Some rushed through their lunch break to return to the class and argue over the merits of hewing too close to actual history. Many turned in remarkable papers, reflecting on the decisions of the class and exploring “what-if” scenarios. The teacher followed up with an invitation to run and observe the game with a senior class. Between the three playtests and another chance to rewrite the rules of the game, we hope to unshackle some of that freeform play we witnessed in the first year while keeping the thoughtful reflection of the second.¹

¹Another pilot session was carried out late into the writing of this chapter. As such, our analysis of that session is ongoing and does not appear here.

27.5 Development of Scalable Resources

In addition to informing our design process for each particular lesson, the pilot testing of subject-specific lessons also contributed to our evolving understanding of the resources and materials we aimed to develop and test in the project's second year. These resources were to be our main output from the project and contribution to COTS game usage in classrooms. Yet, our initial research and first pilot sessions unearthed more questions, rather than solving them:

- What other models of implementation might be used to support a more engaging experience with a game?
- What specific resources might another teacher need to implement this in another kind of classroom, such as a world history class?
- Would other teachers be able to overcome technical, logistical issues, especially around accessing a (downloadable) game?
- What criteria should be used to generate a list of games and lesson plans?
- With (American) schools' increasing adoption of tablet technology, should we focus our efforts there?
- If complex systems and persistence are important, should we focus on "immersive" games, and what constitutes such games?
- If teachers will be ultimately leading these activities, how do we know what game features will be important to them?
- Which popular games might support school-based play, and in what models might these games be used?
- What support might teachers need to develop their own lesson plans using other COTS and unique instructional objectives?
- What resources were required to support interested teachers that would not have the instructional design support of a team of MIT researchers?

The proliferation and complexity of these questions, as well as the specificity needed to answer them, which conflicted with our scalability goals, led us to consider how we could create a resource for guiding teachers through the bevy of constraints, logistical issues, game choices, and curricular needs that we had encountered. We began calling that resource a framework, i.e., a methodological, step-by-step tool, for teachers to guide them as they design their first forays into implementing COTS game-based learning in their specific classrooms.

27.5.1 Framework Design Process

Drawing upon our team's experience designing games for use in classrooms, we were well aware of many potential barriers to entry for teachers hoping to implement game-based learning; some of these barriers are discussed in Chapt. 10 of this volume, "Tipping the Scales: Classroom Feasibility of the Radix Endeavor Game."

As we prepared to work with teachers to develop a series of sample lesson plans, we unintentionally found ourselves defining and documenting an instructional design process for game-based learning. Since we did not yet have a specific teacher and their corresponding design constraints driving our work, we continued to design for more general application in the high school humanities classroom. The result became the first phase of our framework design, a whiteboard showing the messy brainstorming of potential design constraints to consider: subject and content, skills and competencies, technology access and resources, modes of play, pedagogical use, game genre, and time available.

Each constraint alone could influence the instructional design, but how might we build and support a process that could account for all of the constraints together? We imagined many ways of allowing teachers to account for and interact with these design constraints, such as a multi-axis table, a list of these factors, and a suite of sample lesson plans illustrating the varied possibilities. In the end, we decided to present the status of our work as a “working example” (i.e., a flexible submission format meant to facilitate constructive discussions on works in progress) at the Games + Learning + Society 11.0 Conference in Madison, Wisconsin, in July 2015 and solicit input from researchers, designers, and teachers in attendance.

We presented our progress from the first year of our project and posed a question to our session’s attendees: What should the end product look like? The feedback varied widely. Some attendees offered or sought further ideas for the instructional use of using game titles, while others were not sure how our project differed from more theoretical work on COTS games in the classroom. Others expressed concern that we would not be able to achieve codesign with teachers, due to the prohibitive time required to work in a collaborative setting. Others still acknowledged the inherent tension between trying to find games and activities that were teacher- and class-specific yet generalizable to a national and international audience. Ultimately, participants confirmed our suspicions that our most important task involved not winning teachers over to games but working to expand how teachers are approaching the relationship between learning objectives, games, and their role in the classroom as facilitators.

With this feedback in mind, we continued to work through the iterative design process around the framework, discussing it with teachers, peer researchers, and each other. We aimed to bring some structure to the instructional design process that would account for a wide variety of instructional settings, was easy to implement, would encourage rather than discourage teachers, and would integrate some level of playfulness.

27.5.1.1 Card Deck

We created a color-coded card deck, which constituted the second phase of our framework design process. Each color represented a category of design constraint and included enough cards to cover potential design constraints as well as one blank card to accommodate teacher-specific concerns. The categories and constraints were as follows:

Subject and content: history and social studies (government/civics, us history, world history, economics, art history), English/language arts (literature, writing, vocabulary/grammar, Classics), arts (visual, music, design, drama). Skills and competencies: critical thinking/reflection, problem solving, complex systems, persuasive writing and argumentation, perseverance and grit. Technology access and resources: BYOD (bring your own device policies that allow students to use personal devices in classrooms), 1:1 (policies through which students are provided with a particular device that they use throughout an academic term), laptops or tablets (often in the form of a cart, owned by the school, with a classroom's worth of devices that can be borrowed by a teacher for a class session), computer lab, one computer in a classroom, available platforms (console, browser, tablet, phone, PC/Mac download). Modes of play: full class, teacher-facilitated play; small group work in class or in a computer lab; individual play in school; individual play outside of school, either at home or in community spaces. Pedagogical use: context-setting for new material, instructional delivery of new material, repetitive skills practice (commonly known as drills), assessment and/or synthesis of learned materials. Game genre: strategy (real time or turn-based), role-playing, platforming, text-based, shooter or action, puzzle, point-and-click, adventure, shortform/casual. Time available: semester/trimester, unit (a block of class sessions), week, class session. Game selection criteria: student-selected, teacher-selected.

Teachers would use the card deck to drive their learning as well as the instructional design processes. The card deck would force the designer to consider potential constraints and select the cards that best matched their own objectives. Teachers would then be able to design a lesson that would meet their instructional objective.

We tested the card deck at the Media Literacy and the Power of One Conference in November 2015. Session participants were divided into groups with a set of six cards, chosen at random from each of the six categories described above. First, they were asked to spend 5 min listing all of the games they could think of that they or their students enjoyed playing. This exercise allowed the participants to introduce themselves and their experiences of playing games and observing student gameplay trends. Then they were presented with a scenario and a task: They were to play the role of a high school English or history teacher and plan an upcoming lesson, for which they needed to create a game-based learning activity that would meet their instructional objectives while fitting the design constraints dictated by the cards.

Within minutes of starting the lesson planning activity, it became clear that a couple of the cards were preventing groups from making progress, particularly the game genre cards. Once we removed the game genre constraint, the groups easily resumed the activity and were able to generate plausible game-based learning activities that met their instructional objectives and could be implemented using the defined technology resources and time allocation. For example, one group created a lesson for a freshman English class reading Homer's *The Odyssey*. In addition to reading the text, students would play the classic PC game, *The Oregon Trail*. Their summative assessment would be to create a game design document on how they might create a similar game for *The Odyssey*.

While the exercise did not yield a breadth of lesson plans, it did reveal crucial shortcomings of the prototype card deck. As noted above, game genre posed problems for groups, even halting the instructional design process in some cases; this could be due to introducing a specific game genre too early in the process, or that

game genre was not as structuring a constraint as the others. Additional feedback suggested that the time commitment (year, semester, week, one class period) cards were also not necessary in the early planning stages. The more we talked with participants, the more we realized that the categories to include from the outset were highly personal. For some, time was of greatest concern, and, for others, the mode of play was of utmost importance.

27.5.1.2 Mat

As we entered the third phase of the design process, we focused on the usability of the framework. In our testing at the Media Literacy and the Power of One Conference, we had only given the group a small number of cards one from each category. While this was a useful exercise in understanding how teachers might design instructions for a particular set of design constraints, it was not particularly useful in understanding how teachers might use the card deck individually and in a more freeform model. Initial feedback indicated that teachers would need greater context and support to use the cards effectively. After brainstorming and vetting many possible iterations, we developed a mat, fashioned after existing card games that use a game mat to help structure play (Fig. 27.1; shown in use in Fig. 27.2). We thought this format might help provide the necessary structure to support using the cards as a planning tool.

Our playtesting of the card/mat combination uncovered a number of challenges with the design, as explored in our testing notes below:

Context: Testers needed additional instruction about the task at hand. It was unclear exactly what they were designing was the center of the design the game or the instruction or some combination thereof.

Vocabulary: The language used both on the cards and in the verbal instructions were unclear to some testers. As examples, the term COTS and the modes of gameplay were confusing. Testers asked whether there might be a need to embed professional development into the activity in some form and suggested putting definitions or examples on the card deck.

Prioritization: Testers were overwhelmed by the amount of information they had to consider in the planning process.

Fixed factors: The game mat presented all of the categories in equal weight. Testers pointed out this would not be the case in reality. For example, a teacher might not have any control or influence over the technology resources available to students.

They called for a way to differentiate factors that were pre-defined or beyond the teacher’s control or versus those that they could influence.

Optional Priorities: Testers wanted the capability to add categories that were unique to their instructional goals.

Discounted factors: Testers also asked questions about whether they were required to address all of the categories. They suggested including a number of blank

Digital Games in the High School Humanities Classroom

<p>Instructional Time</p> <p>Academic Year Semester Term Unit (6-8 Weeks) Unit (3-4 Weeks) Week Multiple (2-3) Class Periods Class Period - Long Block Class Period - Standart Block Ad Hoc As Time Allow</p>	<p>Technology Platform</p> <p>1:1 iPads 1:1 Laptops BYOD Chromebooks Laptop Cart Playstation Wii XBox</p>	<p>Game Play Location</p> <p>Computer Center in Classroom Computer Lab Home Library Teacher's Computer Projection in Classroom</p>	<p>Group Size</p> <p>Individual Play - Alone Individual Play - Group Setting Pairs Small Group Full Class Play</p>
<p>Relationship to Instruction</p> <p>Pre Instruction Context Setting New Content Instruction Post-Instruction Application Post-Instruction Sk Practice Post-Instruction Assessment</p>	<p>Game Genre</p> <p>Short Form/Casual Role-Playing Puzzle Shooter/Action Strategy Simulation Story-Based Point and Click</p>	<p>Game Selection Criteria</p> <p>Student Selected Teacher Selected Key Words List Historical Time Period Literary Theme Learning Standards</p>	<p>Student Product</p> <p>Game Design Document Persuasive Writing Reflective Writing Journal Individual Presentation Group Presentation Small or large Group Role Play</p>

Fig. 27.1 The Game Mat shows all of the potential criteria a teacher might use

cards that could cover any categories that they did not want to address or consider upfront.

Search/Selection Criteria: Testers wanted to understand how to determine their selection criteria, via subject matter (as opposed to more specific categories like “historical time period”) or keyword search terms (which could be a write-in category and could prepare users for external searches).

Testers also suggested categories they thought were potentially important but missing from our design:

Sound/audio: Testers indicated that games that have sound as a critical component of the gameplay might require additional equipment and set-up time. Teachers would need to consider this factor as they planned their lessons.

Instructional Time Class Period - Long Block	Technology Platform 1:1 iPads	Gameplay Location Computer Lab	Group Size Small Group
Relationship to Instruction Pre Instruction Context Setting	Game Genre Role-Playing	Game Selection Criteria Key Words List	<i>Student Product</i> <i>Game Design Document</i>

Fig. 27.2 A completed game mat provides the foundation for teacher’s research on selecting a potential game for classroom instruction

Game quality: Testers wanted to know more about the quality of the game. The term “quality” was discussed at length. For some testers this meant having data regarding the effectiveness of using the game for educational purposes. Other testers considered included level of engagement, “immersiveness” (a term which is not fully clear here or in other conversations about games and media), and whether a game is factual (i.e. historically or scientifically, although testers also noted that in some cases, the use of a game that drifted from historical accuracy had a potentially meaningful place in the classroom, especially if students were asked to identify inaccuracies as part of their gameplay experience).

Developmental Appropriateness: Age ratings were a concern with testers noting that some schools would not allow teachers to use games rated Mature (deemed appropriate only for players age 17 and up) in the classroom.

Preparation time: Testers noted that lesson time was not the only time that could be constrained, as there could be logistical/setup time, as well as the learning curve for teachers and that for students.

Sequence: Testers also wondered if they should think about these factors in a particular order. Many questions arose about when and how they might consider specific factors.

The testers recommended that the mat/resource would appear in a digital format, perhaps as a searchable database or a similar research tool, which could then include

Game Selection and Lesson Planning Framework

Step 1: Make the Decision to Explore Using Game-based Media



Congratulations on your decision to explore using games in the classroom. Sometimes that is the most challenging step in the process. This may mean you are at your wit's end about how to keep students engaged, or perhaps you are trying to providing more immersive, self-directed learning experiences for your students. Regardless of your motivations, you should walk through the following steps to ensure the experience is a positive one for both you and your students.

Step 2: Determine Your Learning Goal(s)

When using games in the classroom, it is important to understand what you would like your students to get out of the experience. Understanding your learning goals will help you to identify the best model for using the game and the most appropriate titles to use.

- Content focus:** There are many topics for which you may already have effective instructional strategies and where you are confident your students 'get it'. Games often provide their greatest benefit in situations where you have fewer tricks in your bag and where you are looking for new ways to engage your students. Perhaps the topics are a bit dry or abstract or you want to challenge your students to delve deeper. This might be a historical time period, literary genre, economic system, mathematical or science-related concept. It is your classroom so the learning goal should support your instructional needs.

Fig. 27.3 A digital version of the framework guides teachers through a process while also educating users about effective game-based learning practices and resources

embedded, additional research materials. In addition, testers wanted a more linear process to walk them through the instructional design process.

27.5.1.3 Online Tool

In order to address our testers' call for both a digital and more linear process that might minimize the complexity of the multidimensional matrix we had presented, we generated an online tool that walks teachers through a design process. Each step in the process provides some level of professional development or background information that helps users understand the possibilities while also asking thought-provoking questions that would allow teachers to integrate their unique instructional objectives and make the experience their own (Fig. 27.3).

The remainder of Year Two of the project will engage high school humanities teachers in using the digital tool in a self-serve model to design their own game-based learning lesson plans. We will continue working with teachers to understand how the framework supported or hindered their planning and implementation of game-based learning in their humanities classrooms.

27.5.2 *Future Possibilities*

The form of these resources is still under development at the time of this chapter’s publication. Through our iterations on and testing of that form, we are now considering a variety of possible formats for supporting our online tool, including an online database (as suggested by our mat testers) and/or guided experience, which presents the constraint categories of prompts to be filled by the user. When complete, the tool and its supporting materials could produce a sample lesson plan (via procedural construction), or a curated list of similar lesson plans for inspiration, including particular games that could fit that user’s needs. This tool could be accompanied by additional professional development resources, such as an online course which might include a series of explanatory videos and live, interactive question and answer sessions, as well as further guidance through the tool.

This would be an ambitious undertaking but one that could come to fruition both through our team’s further work and through collaboration with educators and researchers across contexts and expertise. Then this tool and its supporting materials could join the databases for games and game-based learning that exist currently and those that have yet to be developed, resulting in a rich, multifaceted, accessible, and collaborative suite of tools for helping educators navigate their various constraints in order to realize the many potentials of game-based learning.

27.6 Reflections and Conclusions

As noted in our introduction and as apparent from our research process, our project changed significantly over its course. The beginning stages of our research rested on what seemed like a foundational assumption: Researchers and educators before us had convincingly espoused the ways in which COTS games can be uniquely engaging and otherwise beneficial to students’ learning in the classroom. As such, teachers are often interested in implementing COTS game-based learning and (merely) need to be pointed in the direction of the right games for incorporation into new lessons within existing curricula. However, at each step of the way, we were reminded of the staggering complexity and variety of classrooms, from teachers’ great needs to their strained resources, from varying teacher expertise to expanding student literacies, and the myriad of other challenges and possibilities in between. We were also reminded that the road for this kind of research is never perfectly paved; we faced setbacks that are not uncommon in such research but did affect the extent of our capacity for codesign and our opportunities for testing.

Yet, where our project ended up looks much like our original formulation of it. Our original goals of creating resources designed from collaboration and testing with teachers has been maintained, and we have seen several iterations of those resources. Those iterations, however, have not yet found their conclusion, a scalable, accessible tool for educators looking toward using COTS games in their classroom.

Thus, our research has not yet landed on its key output, but its current status still, we feel, has much to offer other researchers in our field and area. Our research has followed a methodology drawing from rigorous qualitative social scientific methods, which extract broader patterns from the particularities of its subjects. Our choice of research site has provided rich data that speak to the problems faced by educators in a changing educational context, problems like those underlined in a recent report from the Joan Ganz Cooney Center. Their survey found teachers to be at a loss for bringing games into their classroom, an often solitary, against-the-grain undertaking that suffers from “the lack of a common source for those seeking best practices in using digital tools” (2016). Although our research is deeply and necessarily situated in our specific context, the barriers we encountered and the resulting shifts in our design process can be revealing for all who seek to support teachers who wish to put game-based learning research into practice in their classrooms.

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