Designing sustained game-based learning environments to engage undergraduate students in history

Zach Ryan, Christina Stiso, Joshua Danish, and Eric Robinson

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In order to foster students' engagement and perspective-taking with historical content, we utilize the entirety of a semester-long course to structure an immersive and continuous game-based learning experience where students play the role of a leader of an ancient Greek city-state during the period of the Peloponnesian War.

Authors

Zach Ryan, Indiana University, zryan@iu.edu
Christina Stiso, Indiana University, cstiso@iu.edu
Joshua Danish, Indiana University, jdanish@iu.edu
Eric Robinson, Indiana University, ewr@iu.edu

Abstract

We present reflections on the design of a bespoke academic strategy board game situated in two implementations of an undergraduate history learning environment. Our goal was to create a long-term, immersive game-based learning experience where students continually engaged in role playing alongside their peers through actions structured by the game rules.

Keywords

game-based learning, history learning, role playing, higher education

Design Context

Game-based learning has developed within the field of the learning sciences as an effective way to mediate students' engagement with complex subjects, such as science or history (Squire & Jenkins, 2003; Squire, 2010; Stiso et al., 2020). While studies of game-based learning have identified numerous design elements crucial for supporting learning, many implementations are limited to single curriculum units or activities within a classroom setting (Squire, 2010; Hagood et al., 2018). In contrast, we believe that there are possibilities worth exploring for how classrooms can be designed primarily as long-term gaming spaces in order to foster practices that traditional learning environments have trouble with.

While traditional, lecture style classrooms are efficient in conveying a large breadth of content knowledge to a large number of students, they tend to fall short when it comes to delving deeply into content and imparting practical skills to students (Bransford et al., 2000). Within the context of history learning, for example, there is a distinct struggle to engage students in developing professional practices that are valued within the history community such as historical comprehension, analysis, perspective-taking, and argument construction (Craig, 2017; Monte-Sano, 2011; van Hover & Yeager, 2004). Active learning designs for classrooms offer methods in which teachers can work to deeply engage students beyond rote memorization of content (Birdwell & Uttamchandani, 2019; Craig et al., 2021).

Our approach assumed that one way to support this kind of deep reflection was to support extended engagement with the complexities of a historical context over the course of a semester. With this in mind, we developed a bespoke historical board game that is intended to help immerse students in the time period they are studying—that of ancient Greece in the period leading up to and including the Peloponnesian War (431-404 BCE). Our design was motivated by an intention of having students appreciate the tensions that were felt by the Greeks at the time, and to use these experiences to help them reflect upon a primary source that they were reading concurrently (Strassler, 1998). This was intended to facilitate deeper reflection on what the people in the period experienced, and what motivated them. In sharing our reflections on design implementations in both 2018 and 2021, we hope to provide guidance for other researchers who see the value of extended game play experiences for supporting learning.

Emerging Design Solution

Our design context was an experimental undergraduate history course taught in 2018 and 2021 at a large university in the United States, where 11 of 15 two-and-a-half-hour class sessions were devoted to playing a bespoke strategy role-playing board game, *Cities on the Edge of War,* designed by the 3rd and 4th authors.

The remaining sessions served as an introduction, and opportunities to reflect on the game along with the historical context. The course mostly consisted of students who had taken a prior college level history course, though academic backgrounds varied, as did experience with gaming. Certain roles were given to more experienced history students to help guide the beginning of the game for students, such as key roles in Sparta and Athens. Our game-based learning environment was designed explicitly for students to continuously engage with various historical perspectives over the course of a semester. In working towards designing such an environment we focused on several design features which have remained consistent across both implementations (see Table 1).

Table 1. Design principles informing GBL environment

Design Principle	Reasoning
Extended narrative structure within learning environment	• Playing a certain role over extended periods of time within a linear narrative allows for students to develop their character and historical perspectives as they make their decisions • There is time for students to reflect on the shifts in their in-game relationships, and connect those to the historical events and figures they are reading concurrently. • Over the course of the semester they get to play as two characters, and develop each one within an extended narrative to ensure a diversity of choices and perspectives.

Design Principle	Reasoning
Combination of role play and traditional strategy board game elements	• The structure of the game enhances roleplay in order to increase the number of choices and decisions that players have. • The rules of gameplay provide structure to make key historical elements, such as realistic traveling distances or concerns with prestige and culture within city-states, relevant. • Gamifying features of culture and alliances also meant that students needed to focus on factions and goals in ways that paralleled ancient diplomacy, such as sending envoys across city-states for negotiations or consulting oracles for advice.
Bespoke design of the game made for the situated context	• Most historical games like Reacting are made by a publisher to be generalizable and widely distributed. They make for great resources for classroom teachers, but we intended for our design to be specialized to adapt it specifically to our situated context of an undergraduate history class. • Our game did not fit into any kind of general curriculum, and was designed by an expert in history and an expert in learning theory to meet the needs of the specific classroom context it was being taken into.
Reflection assignments outside of synchronous class time	• Reflection assignments were given as a part of the design of the overall course so that students could think back on events of the game and think directly on how it connected to the events and people they read about in their course readings. • This allowed students to move beyond rote memorization of content and instead allowed students to develop their historical analysis, comprehension, and perspective-taking skills through a combination of their gameplay and readings.

We ground this work in both game-based learning to inform how to engage students deeply in content (Squire, 2010), and sociocultural theories of learning which recognize that the context students are in (i.e., place, language, tools, cultures, and histories) shape interaction and are inseparable from learning (Danish & Gresalfi, 2018). Building on activity theory (Engeström, 1987), we were also particularly interested in how learners' orientation towards a goal or shared object within their activity can mediate or transform their experiences. This led us to position learners as taking on a specific role within the world of the game (i.e. a leader of a Greek city-state) as well as the goals of that character, as key ways to help them orient towards both individual goals, and goals that were shared with other members of their city-state or and with all of Greece.

Role play activities are one approach that focus students on the historical perspectives of figures living through significant events of history, such as the Reacting to the Past game setting (Reacting to the Past, 2019). In Reacting to the Past students play alongside peers and engage with the complex social and political norms present for people of the time. It was created for students to

step away from presentist thinking that often emerges in novice historical discussions (van Hover & Yeager, 2004).

In our context, we sought to incorporate active roleplaying as one of the core design features. Students began each game round with a private goal sheet that indicated their character's motivations and priorities (see Figure 1). Roleplaying allowed students to think about various competing levels of factions that they may be simultaneously working with and against. Students might work to defeat a rival political leader in their own city-state while also working together to build up their city-state.

Figure 1. Example of a character role sheet during the game

<div style="border:1px solid black; padding:10px;">

Lysander of Sparta (naval expert)

You are playing an ambitious and skillful military commander, Lysander. While you hold no governmental office (king, ephor, etc.), and those who do will expect a certain deference from you, nevertheless your talents are recognized and you are able to contribute to deliberations about policy. You have an aggressive war-fighting mindset; however, you are clever enough to realize that victory can be accomplished in a variety of ways, not necessarily always with a simple hoplite attack (the traditional Spartan way of war). Since Spartan kings rarely bother to lead navel forces, they may well consent to let you do so. Secretly, you chafe at the ancient Spartan constitution: it disallows you from ever becoming king, the position for which the gods gave you more native talent than anyone alive in Sparta. And the two current kings are both problematic, one (Pleistoanax) disgraced in the past, the other (Agis) inexperienced. If political change were possible – in a way that wouldn't cause too much Spartan bloodshed, of course– well, you'd have to consider it, for the good of Sparta …

<u>Leader Priorities</u>

— The survival and prosperity of Sparta.

— Defeat for Sparta's enemies and continued Spartan leadership in its League and in Greece. (Track the Sparts/Athens Prestige Table.)

— A more elevated position for you in Sparta. Too bad that, by tradition, kings come from royal families. But must all traditions, even such unfair ones, be honored equally? What would the gods say?

Special talent: When commanding Spartan forces in battle, you may use your +1/-1 modifier not once but three times in the game, tough two of the three can only be used to affect the roll in a naval battle.

</div>

However, in contrast to Reacting to the Past and other game-based learning implementations that are often constrained to a set of curricular activities (Hagood et al., 2018), our design centers the game as the majority of synchronous class time. In total, students played the game for an average of 2 hours in each 2.5 hour long class session. Over the 15 week semester, 11 class sessions were used as game sessions, totaling approximately 22 hours of total playtime for students, or 11

hours per game round. This extended opportunity to play gave students the chance to construct a continuing narrative in their game context and appreciate their character's changing relationships and experiences. This surfaced in class in a variety of ways, such as in the form of impromptu speeches that students would give in 2018 (see Figure 2).

Figure 2. Student giving an impromptu speech as Hyperbolus of Athens

The class was structured into two game rounds, with students switching roles to become a different Greek leader for the second game, which begins a decade or so later. With unique historical perspectives and goals in their new roles, students would have to engage in the game in novel ways.

We also incorporated several features of strategy board games to help structure players' choices. These features included a game map to depict key city-states of the time and for players to visualize their forces (see Figure 3), plastic military units to plan their strategies (see Figure 4), tokens indicating key abilities, action cards to facilitate their turn decisions (see Figure 5), and dice to roll during violent or random encounters.
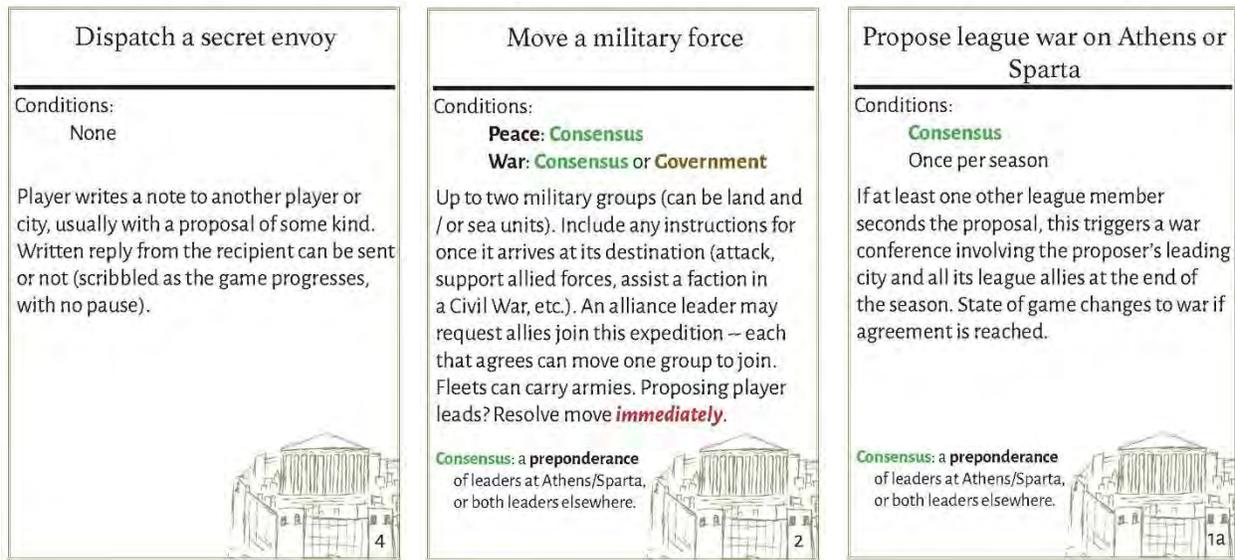
Figure 3. Game map during gameplay in both implementations

Figure 4. Military unit tokens used in 2018

Figure 5. Action cards students could choose for turns

These digital and physical elements of the game encouraged reflection on historical conditions and actions of the time, such as distance capable of being walked in a single season, or leaders seeking the favor of gods from the Greek pantheon for in-game bonuses. While there are many existing games that explore history, and even several centered around the Peloponnesian War, we designed our own specifically so that we could link these game elements to the core historical ideas required in an undergraduate history course.

> Our design was flexible so we could react to students' efforts and emerging understanding of the historical context.

Our design was flexible so we could react to students' efforts and emerging understanding of the historical context. Between each class, the professor (Author 4) would select weekly readings based on game events that took place in the previous class. Students could then directly relate their gameplay to historical people and events in their readings. At the same time, we wanted students to be free to create a world that didn't mirror the historical accounts so long as the students saw the historical pressures and challenges that current scholarship indicates were present in this period. Therefore, we included options for the professor to directly shape the course of events. This included playing the role of non-player characters (such as surrounding city-state leaders) or the Oracle at Delphi (which offered cryptic advice), and introducing sudden "events" in games that mirrored history, like a slave revolt or an invasion by Persia.

Review Process

Prior to the first 2018 implementation, the game was piloted in a one-day session with graduate students to test the features of the game. Their feedback helped to refine the rules of the game. We consistently referenced their feedback and opinions in recurring co-design sessions between a Learning Scientist (Author 3) and a Historian who was the course instructor (Author 4).

Our learning scientist brought experience of how to design for learning environments and thinking about how to structure activity around learning in situated play and game-based contexts, while our historian brought expertise of the historical period, along with experience in teaching the content and designing assignments and assessments for the course. Once the remaining members of the team joined the implementation, they also participated in these reflection sessions. These various stakeholders offered different perspectives for us to reflect on before implementing the design.

During our 2018 implementation, we met weekly to debrief the previous game session. This led to minor shifts in the design, such as the implementation of custom-made 3D printed tokens and dice students could use during their turns. The last class meeting of the course served as a debrief where students discussed how they felt the game and class went. This allowed students who participated in the implementation to offer their feedback and reflect on their experience with the game. Students also completed university course evaluations that were attached to their courses, and offered a perspective on how students thought our game-based design functioned as a history course in their undergraduate careers. They expressed what they felt worked for their learning, and how it differed from other history courses they had previously participated in.

Additionally, we had several meetings between the first iteration in 2018, and the second iteration that took place in 2021. We reflected on changes that needed to be made based on the perspectives offered above. Along with voluntary changes made to refine the design, the onset of the Covid-19 pandemic also caused us to make adaptations that were unplanned, such as moving the course into a digital online context.

Constructive Critique and Reflections

Design principles in practice
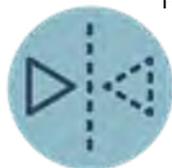
Reviewing student gameplay, we can see how our design principles encouraged student engagement with history and produced learning outcomes consistent with the theories of learning we employed (see Table 2). While we clearly see the ways in which our designs succeeded in practice, there are still tensions and critiques that need to be addressed within our designs that we continue to work on.

Table 2. Design principles emerging in practice

Design Principle	Outcome
Extended narrative structure within situated context	• Students created robust networks of relationships and alliances within each round of the game which represented complex socio-political realities of the period • City-state teams in the game carried out a wide variety of actions in each game round, allowing for engagement in multiple dynamics of the historical period, from monument building to hosting plays to patron deities.
Combination of role play and traditional strategy board game elements	• In each round of the game, each action choice designed in the game was carried out by students within the game. • Students even began creating their own special actions influenced by their readings to expand upon the historical decisions available to them. • Students consistently utilized the historical features embedded into the structure of the game, such as sending secret envoys to other players, or seeking the favor of the gods for in-game bonuses in order to guide their decision making.
Bespoke design of the game	• The bespoke nature of the game meant that our game master knew the rules of the game inside and out, and responded on the fly to adapt the game to different circumstances, such as shifting online. • Several instances arose where game rules caused confusion or did not mesh well with the flow of the game, and the bespoke nature of the game allowed for adjustments to easily be made. • Allowed for the class to relate directly to the game, with readings each week being selected based on the events of the game.
Reflection assignments outside of	• The vast majority of students directly connected their weekly gameplay experiences with the primary source material they read each week.

Design Principle	Outcome
synchronous class time	• Students often used their readings to plan for and influence their gameplay, resulting in students recreating a historical event, or even attempting to avoid events and decisions that may have been detrimental to their city-state in their readings. • Students deeply engaged with their gameplay and historical readings and clearly displayed their developing historical practices through their work and participation.

Reflective Changes

One critique students offered in 2018 was that the smaller city-state teams consisting of two students did not have much to do as the game progressed. They felt that during the middle of each game, they could not influence the course of the game unless they were directly allied with the larger two teams Athens and Sparta. We wanted to address this through several key adjustments to the game design.

First, an additional city-state, Rhegium, was added so that the city-states of Syracuse and Corcyra, which are located on the opposite side of the map from the majority of the other teams, could interact more with players in the early stages of the game, as it took several turns to traverse the map. This also meant that more students could be enrolled in the class. While this helped overall to balance the game in how city-states could interact with each other, we worried that it would further slow down the pace of the game, a critique we received both in 2018 and 2021, that we are still working to refine.

Second, we observed and heard from students playing in the two-player city-states that turn planning often left teammates with nothing to discuss regarding the game after they made their plans for the turn. They were able to more quickly decide and agree upon decisions than the five person teams of Athens and Sparta, and would be left waiting for the duration of the turn. In response, we added a third player to Syracuse and Argos to deepen internal discussions during turn planning. Moving forward, we are considering making all city-states have 3 or more players to further enhance internal discussions. We would also lower the number of player city-states to maintain a similar course size and speed up action execution during turns.

To bring in more Greek culture and increase student choice, we added a new main feature to the game: Kleos (Greek for fame), a type of point that city-states could earn to increase the status of their city-state. Actions were added to raise Kleos, such as pursuing a philosophical discovery, constructing monuments, participating in the Olympics, and putting on a Mousike performance in tribute to a Greek god. Keeping track of Kleos created a historically reasonable way to bring more cultural pursuits into the game, even though the game and course still focused on political and military history.

The onset of the Covid-19 pandemic caused a need to adapt to a fully online course in 2021. We no longer had access to physical game tokens for students to use, and interaction would have to be done through a video window. To streamline technology use, Canvas and Zoom were the only apps we wanted students to employ. We had to overhaul our behind-the-scenes dashboard in order to effectively run the game online (see Figure 6).

Figure 6. Screenshot of City-state dashboard for managing the game

State	Year	Prestige	Season	Freedom	Other reminder:
Complicated Peace	419	3 Athens A:	Fall	0 Neutral	
Reminders					

	Athens	Sparta	Argos	Chios	Corcyra	Corinth	Megara	Mytilene	Rhegium	Syracuse	Mantinea	Thebes
	Dashboard	Dashboard	Dashboard	Dashboard	Dashboard	Dashboard	Dashboard	Dashboard	Dashboard	Dashboard	Dashboard	Dashboard
Reorder	9	8	2	10	11	1	7	6	5	12	3	4
ACTION 1	Foment Revolution in Another City-State	Move Military Forces	Sponsor Mousiké Performance Competition	Move Military Forces	Monumental Construction Project	Move Military Forces	Seek the Favor of the Gods	Move Military Forces	Consult the Oracle at Delphi	Pursue Grand Philosophical Discovery	Propose Alliance (or Change Terms of an	Move Military Forces
ACTION 2	Propose Alliance (or Change Terms of an Alliance	Assail a Political Rival in Your City-State	Seek the Favor of the Gods	Move Military Forces	* Prior action required entire round	Seek the Favor of the Gods	Move Military Forces	Move Military Forces	Sponsor Mousiké Performance Competition	Sponsor Mousiké Performance Competition	Move Military Forces	Move Military Forces
Ready	Ready!	Ready!	Ready!	Ready!	Ready!	Ready!	Ready!	Ready!	Ready!	Ready!	Ready!	Ready!
Governments	Democracy	Oligarchy	Democracy	Democracy	Democracy	Oligarchy	Oligarchy	Democracy	Democracy	Democracy	Democracy	Oligarchy
Military												
Armies	4	3+2E	4	2	2	3	2	2	3	4	2	4
Navies	7/11	1/2	1/1	4/4	2/3	4/5	2/2	3/3	2/3	3/5	0/0	1/1
Mercenaries	0/1	1/1	0/1	1/1	1/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1
Special Units		3										
Wealth	4/5	4/5	3/5	3/5	3/5	3/5	3/5	2/5	3/5	3/5	2/5	2/5
Steps	1	0	0	-1	0	0	1	0	0	-1	1	0
Favor	1	1	3	1	1	4	4	1	2	2	1	1
Tokens	Support (De				ReRoll	ReRoll				Support (o		

Dashboards tracking city-state resources and statistics were used more often during class in 2021 and linked directly to students' Canvas page (Figure 7). Unlike 2018, students had to be on their computers to be in class, so dashboards were more accessible to them.

Figure 7. Screenshot of Athens player dashboard used in 2021 implementation

Due to the online format delaying certain interactions, we completed fewer turns per session in 2021 (2 per session on average rather than 3), which was an issue for students. Students informed us that they wanted more time to play the game as they were enjoying their playtime. They also felt they could not effectively achieve some of the long term goals in the game, such as monument building which took a whole in-game year (6 turns) to complete. Students thus felt limited in planning their actions; this is a tension that we are still grappling with for future iterations.

Improving Student Learning

Student feedback, course evaluations, and final grades from the 2018 implementation indicated that students learned as much if not more than the professor's lecture-based courses on similar historical content. However, one thing we wanted to improve in the course design from 2018 was better connecting the game experience to readings assigned each week. In 2021, the professor incorporated short online discussions asking students to reflect on the readings before class and to consider what in-game actions they might inspire. Weekly post-class short writing assignments were also varied to include chances for students to research "special actions" from history they might incorporate into the game. These new assignments provided additional opportunity to critically think about how

readings might relate to gameplay, and let students complete graded work connecting the readings to their gameplay.

Additionally, students indicated in 2018 that they wanted more explanation of the history coming directly from the professor. In response to this, in 2021 the professor added mini-lectures at the start of each class. Where in 2018 he just asked questions about the reading before jumping into the game, in 2021 there was a dedicated 20–25 minute window where the professor would discuss the week's readings. The goal was to give historical context to some of the decisions and events that took place, both within that game and the history. These mini-lectures were well received by students in 2021 in their feedback of the course, claiming that the reflection and discussion was helpful in connecting their readings and gameplay. However, some lamented that it took time away from game time each week, and while they found the lectures helpful, still wanted a way to be able to get through more turns each week to broaden the array of historical choices and actions students have in game. We are still grappling with this tension of both streamlining the game for students while expanding the rich historical interactions the game produces.

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Implications and Next Steps

Students' feedback across implementations revealed that the game being the central focus of class time, and the extended format of the game, led to deeper engagement and enjoyment while also leading to positive student learning outcomes (Stiso et al., 2020).

According to the professor of the course (Author 4), in 2021 students' final exam responses provided rich and insightful commentary that indicated a deep connection to the readings, directly inspired by their gameplay. Their scores in 2021 were not only higher than in 2018, but also greatly exceeded the professor's lecture-based courses in the same semester on comparable exam questions.

Reflecting on our work, and hearing from students in each iteration, there remain design issues that we are still seeking to address within our context, especially the issue of time. We are still working on how to streamline executing game actions to get through more turns. Across each implementation, we get through about 2–3 per session, and students in both implementations expressed a desire to get through more. This arose mainly out of a desire to play more of the game, but students also felt restricted in being able to carry out long-term strategies that would benefit them in the game, which slightly limited their historical decision-making.

In reflecting on our work, we also thought about how to better consider equity in our context. We were working with a relatively homogeneous classroom with a majority male class. With this taken into consideration, the professor of this course attended to the gendered layout of city-state teams when assigning roles to students. Given the history of inequities present for women in gaming spaces (Kafai et al., 2008), teams were set up so that female-identifying students were not always outnumbered in city-states. While the design of the game and learning environment did not center any specific minoritized identities, one goal of our design was to expand ways in which students could engage in history and invite broader and diverse forms of participation within the learning environment.

We are planning to transition from online back to an in-person implementation in the future, which brings more design complications. While we are excited to bring back the physicality of the game for students such as rolling dice and having manipulatable game pieces, there are also aspects from our online context that we wish to preserve. We found that the online chat function provides rich and detailed side conversations and novel opportunities for participation. We hope to work towards preserving that as we move back to in-person instruction. The digital dashboards allowed for better tracking of information when taking actions in the game, and we want to ensure students can easily access and use them in person.

Feedback gained from our students across both in-person and online implementations have been invaluable in moving the design forward and raising productive tensions to be addressed as we continue to iterate. The key tension we hope to continue exploring is how we can support rapid turn taking so that the game world moves forward while balancing that with opportunities to discuss, debate, and role play to explore the underlying ideas we aim for students to engage with in the course.

References

Birdwell, T., & Uttamchandani, S. (2019). Learning to teach in space: Design principles for faculty development inactive learning classrooms. *Journal of Learning Spaces, 8*(1). http://libjournal.uncg.edu/jls/article/view/1768

Bransford, J. D., Brown, A. L., & Cocking, R. R. (2000). *How people learn* (Vol. 11). National Academy Press.

Craig, K. (2017). Analog tools in digital history classrooms: An activity-theory case study of learning opportunities in digital humanities. *International Journal for the Scholarship of Teaching and Learning, 11*(1), n1. https://files.eric.ed.gov/fulltext/EJ1136120.pdf

Craig, K., Danish, J., Humburg, M., Hmelo-Silver, C., Szostalo, M., & McCranie, A. (2021). Net.Create: Network visualization to support collaborative historical knowledge building. *International Journal of Computer-Supported Collaborative Learning,* 1–39. https://www.springerprofessional.de/en/net-create-network-visualization-to-support-collaborative-histor/19349426

Danish, J. A., & Gresalfi, M. (2018). Cognitive and sociocultural perspective on learning: Tensions and synergy in the learning sciences. In F. Fischer, C. E. Hmelo-Silver, S. R. Goldman, & P. Reimann (Eds.) *International handbook of the learning sciences*, 34–43. https://www.taylorfrancis.com/books/edit/10.4324/9781315617572/international-handbook-learning-sciences-frank-fischer-cindy-hmelo-silver-susan-goldman-peter-reimann

Engeström, Y. (1987). Learning by expanding: An activity-theoretical approach to developmental research. Orienta-knosultit. http://lchc.ucsd.edu/mca/Paper/Engestrom/Learning-by-Expanding.pdf

Hagood, T. C., Watson, E., & Williams, B. M. (2018) Reacting to the past: An introduction to its scholarly foundation. In C. E. Watson, & T. C. Hagood (Eds.), *Playing to learn with Reacting to the Past*. Springer. https://link.springer.com/book/10.1007/978-3-319-61747-3

Kafai, Y. B., Heeter, C., & Denner, J. (Eds.). (2008). Beyond Barbie and Mortal Kombat: New perspectives on gender and gaming. MIT Press.

Monte-Sano, C. (2011). Beyond reading comprehension and summary: Learning to read and write in history by focusing on evidence, perspective, and interpretation. *Curriculum Inquiry, 41*(2), 212–249. https://www.tandfonline.com/doi/abs/10.1111/j.1467-873X.2011.00547.x

Reacting to the past. [Board game.] (2019). Barnard College. https://reacting.barnard.edu/

Squire, K. (2010). From information to experience: Place-based augmented reality games as a model for learning in a globally networked society. *Teachers College Record, 112*(10), 2565–2602. http://remikalir.com/wp-content/uploads/2017/10/Squire2010.pdf

Squire, K., & Jenkins, H. (2003). Harnessing the power of games in education. *Insight, 3*(1), 5–33. http://socrates.acadiau.ca/courses/engl/saklofske/download/digital%20gaming%20education.pdf

Stiso, C., Ryan, Z., Danish, J., & Robinson, E. (2020). Fostering perspective-taking in history students through board games. In M. Gresalfi, & I. S. Horn (Eds.), The interdisciplinarity of the learning sciences, *14th International Conference of the Learning Sciences (ICLS) 2020*, Nashville, TN. https://repository.isls.org/handle/1/6310

Strassler, R. B. (1998). *The Landmark Thucydides*, trans. Richard Crawley, New York.

van Hover, S. D., & Yeager, E. A. (2004). Challenges facing beginning history teachers: An exploratory study. *International Journal of Social Education, 19*(1), 8–21. https://eric.ed.gov/?id=EJ718724

Resources

Reacting to the Past. [Board game]. Reacting to the Past, Barnard College, 2019. https://reacting.barnard.edu/

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