Annals of Social Studies Education Research for Teachers (ASSERT)

Simulations in Social Studies: Practical Implications from Classroom to Extended Reality

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Published June 29, 2025

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DOI

https://doi.org/10.29173/assert86

Pages: 29-53

ABSTRACT

This paper examines the use of simulations in social studies education, from traditional classroom methods to extended reality (XR) technologies. Our research explores experiential learning in social studies, ranging from traditional classroom simulations to extended reality (XR). Our research explores the affordances of using both traditional and extended reality (XR) simulations to teach hidden and hard history. Key findings highlight the importance of purposeful instructional design, structured inquiry, and ethical considerations when implementing simulations, particularly for sensitive historical subjects. The research reveals that well-designed XR simulations can enhance student engagement and historical understanding by making the past visible and accessible. However, educators must carefully balance immersive experiences with critical analysis and avoid role-playing traumatic events. The study provides practical implications for educators, including strategies for integrating XR simulations into curricula and addressing the technological challenges of evolving platforms. This research contributes to the ongoing

Keywords Simulations; Digital Simulations; Hidden Histories; Hard Histories, Instructional Design; Social Studies Education

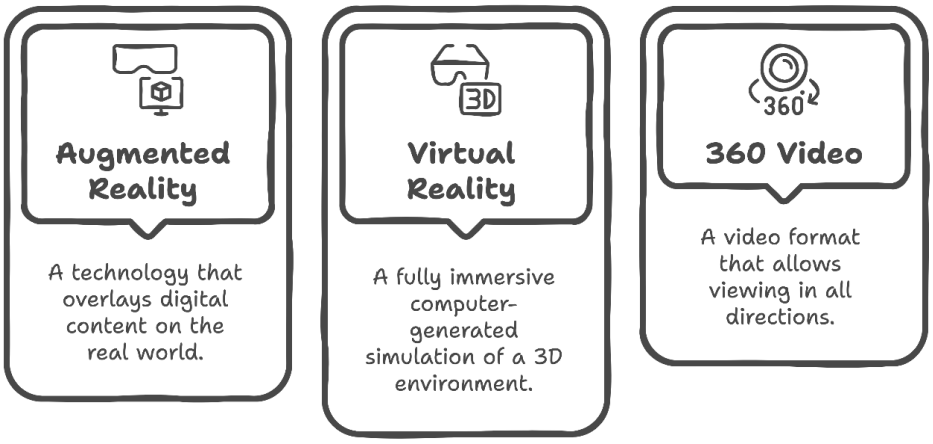
How to cite this article (APA): Hicks, D., Ogle, J. T., & van Hover, S. (2025). Simulations in social studies: Practical implications from classroom to extended reality. *Annals of Social Studies Research for Teachers, 7(1), xx-xx.* https://doi.org/10.29173/assert86

INTRODUCTION

The call for this issue on simulations acknowledges that simulations offer significant educational benefits, but also pose risks when poorly designed, especially when teaching difficult histories (see Elam 2022; Helmore 2024). Many educators, despite good intentions, have failed to heed Bell's (2019) warning that "simulating traumatic experiences is ineffective." Effective simulation design requires attention to learning objectives, student engagement, historical accuracy, ethics, and technology's unique affordances (Ogle & Hicks, 2024). Our research explores experiential learning in social studies, ranging from traditional classroom simulations to extended reality (XR). XR encompasses a range of immersive tools, including augmented reality (AR), which overlays digital content onto the real world, virtual reality (VR), which creates fully immersive digital environments, and 360-degree video, which allows users to explore a location from all angles (see Figure 1). Our work examines how these tools can serve as windows into the past, making historically-invisible spaces and locations visible in the present.

Figure 1

Extended Reality Technologies



Note. Extended Reality spans augmented reality, virtual reality, and 360-degree video.

THE RESEARCH

Our research journey began with a study of how social studies teachers implemented experiential learning techniques in their classrooms. In Dack et al. (2015), we analyzed 438 videotaped social studies lessons across grades 3-12 to understand the extent of experiential learning and to identify both effective strategies and pedagogical pitfalls. This study employed qualitative analysis methods, including detailed coding of lesson content and implementation strategies. Subsequently, our research expanded to investigate the affordances of using XR to create immersive experiential place-based historical representations designed to make the past visible to users. This work involved the design, implementation, and evaluation of three XR simulation projects—*CI Spy*, *The Solitude Experience,* and *The Vauquois Experience*—each chosen for their potential to illuminate hidden, or difficult, histories (See Table 1).

Table 1

XR Historical Simulations

Project Name	Technologies Used	Historical Content	Target Audience	Locations
CI Spy	AR and VR	Hidden history of Christiansburg Institute (former African American School- that is now a derelict site)	5th grade social studies class. Local history curriculum	Field trip to the derelict campus as part of 5th grade local history curriculum
Solitude Experience	Wearable AR	University campus building's history as an indigenous site and slave plantation	General public	Field trip to explore the History of the Oldest Building on Campus- Solitude

The Vauquois Experience	Virtual Reality and 360 Video	World War I tunnel system in France	General public, but specifically used with 7th grade and 11th grade social studies classes	Middle School VR lab, online virtual environment, University Libraries, Local History Museum, Smithsonian Museum of American History

Each place-based simulation was guided by the overarching question: "If this place could talk, what would it tell us about the lives, communities, and experiences of the people here at the time?" Our research systematically evaluated the role of place illusion (feeling present in a historical setting) and plausibility illusion (perceiving the experience as realistic) as a critical element to sustain participants' engagement within an inquiry. Across projects, we stressed an engagement-first approach designed to have participants work with historical content in real-time. We also employed epistemic frames that encouraged learners to take on roles such as junior detectives, time travelers, or archeologists/historians.

Across our projects, we iteratively designed and refined XR experiences based on user feedback to better align with educational goals. Our data collection methods included observations, interviews, and a user think-aloud protocol during testing sessions. In Fitzpatrick et al. (2021), we shifted our focus to evaluating how XR simulations could be integrated with traditional historical sources, developing and testing instructional scaffolds for inquiries on the Holocaust and the Civil Rights Movement.

FINDINGS

Our research has yielded several key findings with significant implications for instructional design in social studies education.

Challenges with Classroom Simulations

Dack et al. (2015) revealed that only 14 out of 438 lessons used experiential simulation. Many lacked clear instructional purposes, asked students to imagine they were a person from the past, were derailed by unexpected student responses, or inadvertently reinforced misconceptions. Teachers often struggled to balance engagement with content, resulting in simulations that were more entertaining than educational. Even successful activities emphasized factual recall over disciplinary thinking.

Potential of XR Simulations

Our XR simulations demonstrated the technology's potential to address challenges identified in traditional simulations, particularly in terms of feeling "present" and connected to places and people in the past (Ogle & Hicks, 2024). The CI Spy project (Johnson et al., 2017) used AR to enable students, as junior detectives, to explore a former 13-building African American school—now reduced to one derelict structure—revealing hidden narratives of segregation-era education. The sense of being "present" proved crucial for fostering an inquiry-based approach to learning.

Creating Authentic Historical Environmental Representations

The Vauquois Experience (Duer et al., 2020; Ogle et al., 2020) demonstrated the power of recreating authentic historical environments in VR to reveal otherwise inaccessible aspects of the past. By recreating WWI tunnels based on laser-scanned data, the experience provided a sense of "being there" that traditional methods couldn't match (see Figure 2 below).

Balancing Engagement and Learning

In working with teachers and students, we recognize the “novelty effect” that often accompanies new classroom technologies. However, in our designs, simulations serve as components of disciplined inquiry, where students pose compelling questions, analyze sources, make evidence-based claims, and present findings orally or in writing. The simulations themselves function as sources to be critically examined within the inquiry process. To support both cognitive and affective learning, we incorporate explicit scaffolds, including challenge cards, structured source analysis, and an epistemic stance. These strategies effectively balance student engagement with the persistence needed to navigate historical inquiry—from questioning to forming evidence-based conclusions as part of their final assessment.

Figure 2

The Vauquois VR Experience

XR as a Historical Source

Our work on integrating XR into C3 inquiries (Fitzpatrick et al., 2021) revealed the potential for treating XR experiences as sources to be analyzed. This approach requires careful instructional design to help students critically examine these experiences, considering aspects such as authorship, purpose, and historical accuracy.

Ethical Considerations

Our research highlighted the need for careful ethical consideration when using XR to reveal difficult or sensitive histories. There's a need to balance immersive engagement with respectful treatment of sensitive topics, avoiding trivialization or oversimplification of complex historical narratives.

Iterative Design Process

All XR projects benefited from iterative design with rounds of testing and refinement highlighting the need for flexibility in instructional design to align learning goals with immersive experiences (see Gutkowski et al., 2021). These findings point to the potential of XR to create powerful learning opportunities in social studies by making the past visible to students. Effective design must consider learning objectives, student engagement, historical accuracy, ethical implications, and the unique affordances of the technology to reveal hidden and hard histories.

PRACTICAL IMPLICATIONS FOR TEACHERS

Based on our research, several practical implications have emerged for incorporating simulations into social studies classrooms:

Purposeful, Iterative, and Aligned Instructional Design

Whether designing traditional classroom simulations or XR simulations, careful instructional design that aligns experiential activities with specific learning objectives is necessary. Key initiating design questions include:

- What do I want my students to learn through this experience in a safe and appropriate manner?
- How will they perceive and make sense of these experiences?
- How will their experiences align with my learning objectives?

Structured Inquiry through Scaffolding and Explicit Strategy Instruction

Developing accessible guiding questions shapes the entire instructional experience and fosters historical inquiry. Strong questions encourage students to critically engage with historical content rather than passively consume it. To prevent students from feeling overwhelmed, scaffolding is essential. Embedding historical thinking supports within the simulation helps students analyze and synthesize historical sources as they work to answer the guiding questions. For example, in *CI Spy*, we used the SCIM-C protocol to help students analyze embedded historical sources. Virtual sources were placed in the only remaining real building and in several reconstructed virtual buildings. These housed oral histories, text excerpts, and photographs, which students examined as historical detectives. Using SCIM-C, they crafted evidence-based claims for their final report answering the guiding question: *If this place could talk, what would it tell us?* Explicit prompts tied to “information points” guided students to analyze key design features and content, such as assessing the significance of an artifact or understanding the lived experiences represented in the simulation. Post-simulation reflections then helped students connect their experiences to broader historical narratives and learning objectives.

Purposeful Integration of XR Simulation

Well-designed XR simulations can reveal hidden histories and give students active roles in exploring otherwise inaccessible historical places. Before implementation, teachers should first experience the immersive environment to determine when and how it best fits their curriculum. XR simulations can

be integrated into inquiry-based units, serving as sources alongside traditional materials for student analysis. For example, middle school teachers incorporated *Virtual Vauquois* into their World War I unit as one of several learning centers. Guided by the question, *If this place could talk, what would it tell us about the nature and impact of World War I on people, places, and the environment on the Western Front between 1914 and 1918?*, students explored topics such as medical advancements, military strategy, environmental effects, and technological innovations. *Virtual Vauquois* combined 360-degree video of the present-day landscape with a simulation that allowed students to navigate the extensive tunnel system. This experience illustrated key concepts such as war of attrition, stalemate, and the transition from street fighting to trench and tunnel warfare, as well as the differing conditions for French and German soldiers. Challenge cards helped students focus their analysis, share findings, and ultimately develop individual reports answering the guiding question.

Practical Concern with the Longevity of XR Experiences

A key challenge is the ever-changing nature of XR platforms. Even established companies have a habit of discontinuing or changing platforms with minimal notice, posing a challenge for teachers trying to integrate these tools sustainably. For example, Google Expeditions, once a great resource for easy-to-use VR experiences, was discontinued. However, there are still valuable XR experiential simulations available online (see Table 2).

Table 2

Example Historical XR Simulations available to the public

Title	Description	Availability
1943 Berlin Blitz	Created by the BBC, this simulation combines historical audio recordings with first-person XR simulation for a ride on an RAF night raid over Berlin.	Available on the Steam Store and the Meta Store
The Anne Frank House	A first person XR simulation of the secret living space they occupied in Amsterdam prior to their discovery by the Nazis.	Available on the Meta Store

Cyark Tapestry	The non-profit organization, Cyark, presents virtual exhibits of ancient cultural heritage sites around the world that they have preserved digitally, via their Tapestry website.	Available on the Cyark Tapestry Website

Provide Opportunities for Student Creation

The technological barriers to building XR immersive experiences are falling. Opportunities now exist for students to create their own immersive experiences as part of their learning. This can involve using simple, readily available AR creation tools to annotate physical space with historical information or create 360° virtual tours of local historical sites (see Table 3).

Table 3

Example platforms for creating XR (free and paid)

Title	Description	Cost
PlayCanvas	Open-source game engine for creating Web-based games	Free
GDevelop	No-code required game engine for creating multi-platfrom games	Free
Adobe Aero	Software for easy creation of augmented reality experiences	Subscription

Consistent Focus on Ethical Considerations

When designing and selecting XR experiences, especially for difficult histories, carefully consider how the experience will be received. Attend to ethical implications by avoiding experiences that trivialize events, reinforce stereotypes, or present simplistic, singular perspectives. Debriefing is an essential component of effective simulation use and should be done in a timely manner. It isn't enough for students to simply experience the simulation; they need time to reflect and unpack the

"burden of representation" to critically analyze how the past was depicted, whose perspectives were highlighted or omitted, and what messages were conveyed. Such reflections help students develop a more nuanced understanding of history and the complexities involved in representing historical events.

CONCLUSION

Historical simulations using XR technologies can enhance student engagement and historical understanding in social studies when used thoughtfully. Effective implementation requires careful design, scaffolding, and ethical considerations. XR can make the past visible, allowing students to actively engage in place-based historical inquiries. Whether in a "traditional" simulation or XR simulation, the crucial takeaway is to avoid having students role-play specific individuals and groups from the past, especially in traumatic contexts. This approach is pedagogically unsound, but great fodder for media headlines.

Q & A with David Hicks, J. Todd Ogle, and Stephanie van Hover

Question #1

Teacher's Question:

How/when should teachers use simulations versus authentic primary documents like narratives/diaries, etc., to prohibit the reinforcement of trauma?

David, Todd, and Stephanie's Response:

The XR simulations highlighted in our research are place-based, designed to immerse students in authentic historical sites while engaging in rigorous analysis of primary sources. These simulations are not about stepping into the role of historical figures or attempting to "feel" the past, but rather about providing a spatial understanding of history. By allowing students to see what was—and was not—left behind, XR can make the *invisible past* visible and serve as a portal into historical inquiry.

A key distinction is that these immersive experiences do not ask students to assume identities or emotionally empathize with individuals from the past. Research consistently shows that it is impossible for adolescents to fully grasp what it was like to live in a different time and place (Barton & Levstik, 2004; Davis et al., 2001; Yeager & Foster, 2001). Historical empathy is not about "walking in

someone else's shoes," but about critically examining evidence and perspectives. XR simulations, therefore, function as sources themselves—historical artifacts to be analyzed alongside primary documents, rather than as emotional or theatrical exercises. Many of these immersive experiences also integrate primary sources directly, enabling students to explore them in context and through structured inquiry. This demonstrates that it is not a question of *simulations versus historical sources*, but rather how these tools work together to support historical thinking.

As for when and how to use simulations, we believe that teachers must be intentional, knowing both their students and their content. In general, simulations should avoid role-play, dramatization, or any form of "make believe" activity. Classroom observations in our research revealed that students were sometimes asked to "understand" what it was like to be an immigrant or an Indigenous child forcibly sent to a boarding school. Such activities not only oversimplify complex historical experiences, but can also reinforce trauma rather than facilitate meaningful learning. Instead, XR simulations should focus on connecting students to a *place*—not a person—and guiding them through an inquiry-driven

process that interrogates historical sources to understand past perspectives. LaCapra (1999), in his work on the Holocaust and trauma, argues that ethical historical engagement requires "empathetic unsettlement"—a stance that acknowledges difference rather than appropriating another's experience. This distinction is crucial. When designed thoughtfully, XR simulations provide students with a deeper understanding of historical spaces, events, and structures without collapsing into problematic reenactment.

Ultimately, our research underscores that simulations should function as tools for inquiry, not as reenactments. By centering historical investigation on primary sources and using simulations to enhance—not replace—contextual analysis, educators can foster rigorous historical thinking while ensuring responsible and ethical engagement with the past.

Question #2

Teacher's Question:

When engaging in a simulation such as the *CI Spy Project*, how can teachers provide student language to help discuss their findings regarding segregation and racist approaches while still honoring the work of African American teachers/students in the school?

David, Todd, and Stephanie's Response:

This is a great question, and brings back vivid memories of working with 5th graders as they engaged in on-site historical inquiry through the *CI Spy* immersive experience. As part of this experience, students analyzed historical sources such as newspaper articles from the period, encountering language such as *colored* and *Negro*. Their reactions varied—some hesitated to read these terms aloud, while others seemed drawn to the unfamiliarity of the language. This underscored the importance of preparing students to critically engage with historical sources while maintaining respect for those who lived through these experiences.

To support students in this process, we took direction from previous structured inquiries around topics such as the Civil Rights Movement, Japanese internment, and child labor. In *CI Spy*, students were given the epistemic stance of *junior history detectives*, responsible for investigating historical sources as evidence of past events and perspectives (Hicks et al., 2016). This framing helped them understand that they would encounter language reflective of the time periods they were studying—language that might be outdated or offensive today. A key part of their role was recognizing the

historical context in which these sources were produced (e.g., Jim Crow, World War II) and reflecting on how beliefs, attitudes, and language have changed over time.

We also emphasized that historical sources are records and relics of the past, shaped by the perspectives of those who produced them. By positioning students as responsible investigators, we provided a framework that enabled them to thoughtfully analyze primary sources while honoring the resilience and achievements of African American students and teachers.

CI Spy: A Forward-Thinking Approach to Segregation and Resilience

From the project's inception, *CI Spy* was designed to be more than just an examination of segregation—it was developed to highlight the resilience and agency of the African American community in Southwest Virginia. Working with alumni of the school and public historians, we sought to make visible a hidden history. Our guiding question—*If this place could talk, what would it tell us about the people who were once here?*—invited students to engage deeply with the lived experiences of those who attended and taught at the school.

Most students had some familiarity with Jim Crow and the Civil Rights Movement from previous learning, but they knew little about the existence of a segregated school in their own community. In fact, their lack of prior knowledge was an asset, as it allowed them to approach the inquiry with

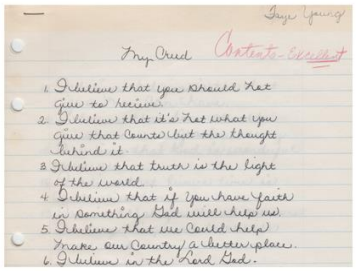
curiosity and a sense of discovery. The current site is easy to overlook—only the Edgar A. Long Building remains, deteriorating on a three-acre lot surrounded by industrial buildings, a daycare center, and a high school. However, between 1866 and 1966, Christiansburg Institute (CI) was a cornerstone of the African American community in Southwest Virginia. The 185-acre campus once housed thirteen buildings, and Booker T. Washington served on its board of supervisors. *CI Spy* was designed to engage students with primary sources in a way that acknowledged segregation while highlighting the rigor and richness of education at CI. Through the *CI Spy* app, students explored historical sources—including class schedules, yearbooks, oral histories, and artifacts showcasing academic preparation, vocational training, and extracurriculars like the CI band and basketball team that were digitally housed in the real and virtual buildings (see Figure 3) (Ogle & Hicks, 2024).

Figure 3

Real and Virtual Locations and sources at Christiansburg Institute

Sources Used

Location	Artifact/Sources
Edgar A. Long Building (Academic focus)	French textbook Student writing sample Oral history from Ms. Charlton's student Daily schedule
Scattergood Gym (Extracurricular focus)	Image of CI band Oral history from CI band member Image of Nativity school play Newspaper clipping of CI Glee Club Image of CI basketball team
Trades Building (Trade/Skill preparation)	Oral history from CI barbering student Cosmetology tools from CI Yearbook photo of CI barbering class Cosmetology textbook Image of cosmetology class in action



This inquiry revealed a history of quality education, resilience, and agency, countering narratives of victimization and emphasizing the strength and determination of those who built and sustained this institution. As part of the inquiry, students compiled a final detective report based on their source analysis to answer the guiding question. Structured prompts helped them focus on key themes: overcoming challenges, the role of teachers in shaping education, opportunities created for students, and the significance of CI—why it should be remembered today. Two unexpected outcomes of this work was a presentation created and delivered to the School Board by the 5th graders, urging the county to take action to preserve the former school as a historical site, and the creation of a museum

exhibit at the local high school, highlighting CI's impact on the community for over a century. By positioning students as investigators and equipping them with the tools to analyze language and historical context, *CI Spy* allowed them to examine segregation in a way that did not diminish or erase the contributions of African American educators and students. The inquiry was never about passive reflection on injustice; rather, it was an active, forward-thinking process of recognizing history's complexities.

Question #3

Teacher's Question:

"Historical simulations using XR technologies can enhance student engagement and historical understanding in social studies when used thoughtfully. Effective implementation requires careful design, scaffolding, and ethical considerations." These statements are crucial for teachers to consider before engaging in simulations. Is there a set of criteria (checklist) you could suggest for teachers who may not be from the underrepresented community that is part of the historical context to prepare for the experience?

David, Todd, and Stephanie's Response:

As educators, we recognize the importance of structured decision-making—and one of us, in particular, is a fan of Atul Gawande's (2010) *The Checklist Manifesto*. Gawande (2010) illustrates how checklists help professionals navigate complexity, prevent critical oversights, and make more defensible, ethical decisions—principles that apply directly to the design and implementation of historical simulations and XR technologies in social studies.

While simulations can enhance engagement and deepen historical understanding, their effectiveness depends on careful design, scaffolding, and ethical considerations. This is particularly crucial when teachers engage with histories of underrepresented communities to which they do not belong. Without intentional planning, simulations risk reinforcing stereotypes, oversimplifying complex histories, or causing unintended harm rather than fostering critical inquiry.

To help teachers navigate these complexities, we propose a checklist as a structured decision-making tool—similar to Gawande's approach—to evaluate when, how, and why to use simulations. Inspired by Rodríguez & Swalwell's (2023) decision-making tree for dramatization and gamification, the checklist provides a clear scaffold for teachers. If you find yourself answering "no" to any of these

questions, it may be worth pausing to ensure your approach is historically responsible, pedagogically sound, and ethically defensible before moving forward.

Checklist for Using Simulations & XR in Social Studies

Before the Experience: Preparation & Ethical Considerations

- ☐ Ensure Historical Accuracy & Representation
  - Have I included primary sources and narratives from the underrepresented community?
  - Does the XR experience highlight agency, resilience, and historical complexity rather than reducing history to trauma narratives?
  - Have I evaluated who created the XR experience and what perspectives it presents?
  - Have I walked through the simulation myself and consulted colleagues?
- ☐ Prepare Students for Thoughtful Engagement
  - Have I established a safe and respectful classroom environment for discussing complex histories?
  - Have I provided necessary background knowledge and guidance on historical language to prevent misconceptions?
  - Is this framed as a historical inquiry rather than an immersive role-playing exercise?
- ☐ Assess Ethical & Emotional Risks
  - Does this activity avoid stereotypes, trivialization, or emotional reenactments?
  - Have I considered potential harm (reinforcing bias, trauma, or oversimplification)?

During the Experience: Scaffolding & Student Inquiry

- ☐ Guide Ethical Historical Inquiry
  - Are students positioned as historians, not actors, using source-based inquiry rather than reenacting oppression?
  - Have I provided structured analytical tools (e.g., SCIM-C, RICH, corroboration strategies) to guide source evaluation?
  - Do discussion prompts encourage critical thinking and questioning of historical narratives?
  - Are assessments aligned with disciplinary inquiry rather than simplistic empathy exercises?
- ☐ Monitor Emotional & Ethical Impact
  - Are students critiquing not just sources, but also who produced the XR representation and why?

- Have I established clear ethical boundaries (e.g., no trauma reenactments, no forced role-playing)?
- Am I checking in on students' emotional responses to ensure psychological safety?
- Have I framed this as a disciplinary act of historical inquiry, rather than the passive consumption of digital history?

After the Experience: Reflection & Analysis

☐ Critically Evaluate XR as a Historical Source

- Have students compared and corroborated the XR experience with primary and secondary sources to evaluate evidence, reliability, and perspective?
- Are students identifying biases, omissions, and interpretations in the XR representation?
- Have I facilitated discussions on how history is constructed and represented?

☐ Connect to Contemporary Issues & Action

- Am I prepared to guide students in drawing connections between this history and contemporary systemic issues?
- Have I encouraged students to explore modern parallels and take informed action?
- Have I equipped students to critically analyze how digital history and immersive environments are created, and whose stories it amplifies or excludes?

Question #4

Teacher's Question:

What are the benefits of students taking on the roles of "junior detectives, time travelers, or archeologists/historians" in extended reality simulations (as opposed to historical actors)? How does the choice of simulated roles impact a simulation lesson's learning goals/activities?

David, Todd, and Stephanie's Response:

This is an excellent question, as it speaks directly to the core of how we want students to engage with historical inquiry in XR environments. Much of the negative media attention surrounding educational simulations has focused on cases where students have been asked to role-play as historical actors in problematic ways—situations that often lead to ethical concerns, emotional harm, or historical oversimplification. Our work builds on the design based curricular and pedagogical research of Parker et al. (2011; 2013) and Stoddard et al. (2018; 2022) by focusing instead on disciplinary ways of thinking that position students as investigators of history, rather than reenactors of it.

We deliberately assign students to roles such as junior detectives, time travelers, archaeologists, or historians because these positions encourage students to engage in historical inquiry, analysis, and

argumentation within lessons, rather than passively experience a historical setting (Hicks et al., 2016; Ogle & Hicks, 2024). These roles are epistemic frames (Shaffer, 2006) that help students think like professionals in the field—gathering and analyzing evidence, making claims, and constructing arguments—rather than simply adopting a character in a historical narrative. This is important within our instructional design as students' final assessments, aligned with learning goals, are to develop and communicate evidence-based claims in reports and presentations, revealing their findings in relation to the guiding question: "If this place could talk, what would it tell us about …?"

A central challenge in using XR simulations is that there is often limited time for students to engage with the content. Unlike classroom projects that unfold over several lessons, immersive experiences need to be short and need to be meaningfully integrated into a larger instructional arc. Following Parker et al. (2011; 2013) and Stoddard et al. (2018; 2022), we take an "engagement-first" approach (Ogle & Hicks, 2024), which means that students are not required to learn everything before entering the experience; instead, they gain knowledge through the act of inquiry itself.

This stands in contrast to simulations where students take on the roles of historical figures, which often require extensive pre-loading of content knowledge and can lead to problematic *weak empathy* exercises (Rodríguez & Swalwell, 2023). Research has shown that students cannot truly "be" historical actors—they lack the lived experience, contextual knowledge, and worldview of people from the past. (see Barton & Levstik, 2004; Davis et al., 2001; Yeager & Foster, 2001). Instead, we focus on helping them think like historians, where their job is to examine sources, contextualize information, and make evidence-based claims.

Additionally, Rodríguez and Swalwell (2023) raise concerns about the harmful racial and ethical implications of role-based simulations. They argue that many classroom simulations are designed through and for a white gaze, intended to cultivate empathy in white students while disregarding the impact on students from historically-marginalized communities. They warn that these types of activities often retraumatize BIPOC students (p. 122) by forcing them into historically oppressive roles, such as enslaved people or victims of colonization, in ways that reduce complex histories to simplistic and harmful reenactments.

Given these concerns, we are intentional about ensuring that XR simulations do not become sites of performative history. Instead of asking students to “step into the shoes” of historical actors, we

provide them with disciplinary roles that allow them to analyze, interpret, and critique history—ensuring that their engagement is intellectual rather than an exploitation of emotion. We see XR as one part of a broader inquiry arc, rather than a standalone activity. In our work, immersive experiences are deliberately designed to drop in at any point in a unit, serving as an opportunity for students to apply knowledge, generate questions, and construct interpretations that can be further corroborated with classroom learning. Our stance mirrors the design of the Purple States political simulation (Stoddard et al., 2018; 2022), where students take on the role of political campaign interns, using polling data to craft strategic messaging. Similarly, in Parker et al.’s (2011; 2013) design-based research on AP U.S. Government, students took the epistemic stance of legislators setting up their offices, managing competing interests, and building legislative agendas. In both cases, students were not passively playing historical characters; they were acting to learn, engaging in problem-based learning as part of a structured inquiry. For our purposes, we emphasize that students must enter an immersive environment with a clear, investigative purpose based around our guiding place-based question designed to make the invisible past visible: whether it is to analyze artifacts as rescue archaeologists on a World War I site (Virtual Vauquois), track historical patterns as time travelers, or build interpretations as historians (Hicks et al., 2016; Ogle & Hicks, 2024). They do not simply absorb information; they must use it, question it, and construct knowledge from it. A critical benefit of designing XR simulations in this way, we believe, is that it helps students develop the knowledge, dispositions, and skills that can be used, and transferred, beyond the simulation itself. Taking on an investigative role within an inquiry arc means that students are learning how to:

- Analyze sources
- Evaluate different forms of evidence
- Construct well-reasoned arguments
- Understand history as an inferential inquiry-based discipline

We see these as the foundational knowledge, skills and dispositions that are essential in historical thinking, disciplinary literacy, and civic reasoning. By embedding them in a XR experience, we are reinforcing learning by doing, in alignment with cognitive apprenticeship models that emphasize the progression from novice to expert thinking. By placing students in investigative rather than

performative roles, we ensure that XR simulations serve as powerful learning tools, supporting deep historical inquiry rather than reinforcing weak empathy exercises or simplistic historical narratives. Our work stresses the connection between the most meaningful learning that happens when students are engaged in the act of investigation, interpretation, and argumentation, not when they are asked to "perform" history.

Question #5

Teacher's Question:

Why is engaging with extended reality simulations as historical sources important? How does the analysis of simulations compare to the analysis of other primary and secondary sources like photographs, documents, or films?

David, Todd, and Stephanie's Response:

Through our research and practice, we have developed frameworks for engaging with XR simulations as historical sources. We know that all sources—whether documents, photographs, films, or immersive digital experiences—are representations of the past shaped by the perspectives of their creators. Sources do not speak for themselves; they must be questioned, contextualized, and interpreted within an inquiry to be used as evidence (van Hover et al., 2021), and XR simulations are no exception. Our design-based work underscores the importance of treating XR simulations as historical sources, just as we do with photographs, documents, films, and oral histories. We know that sources do not speak for themselves; they must be questioned, contextualized, and interpreted within an inquiry to be used as evidence. In our work, we emphasize that XR experiences, like traditional sources, serve as records, relics, and representations of the past. They provide unique opportunities for historical inquiry but also require scrutiny. They do not offer a direct window into history, but rather an interpretation that carries the burden of representation and the constraints of design choices. Historical sources, whether digital visual, textual or oral, all come with strengths and limitations (van Hover et al., 2021). In light of the question, we briefly outline some of basic understandings that ground our work with sources (see Table 4).

Table 4

Comparing Source Types

Source Type	Strengths	Limitations	Records, Relics, and Representational Considerations
XR immersive environments	Immersive, spatial learning; Allows users to interact with reconstructed historical spaces; Makes lost or inaccessible locations visible.	Subject to design bias; Digital reconstructions may contain inaccuracies; Risk of oversimplification or omission of perspectives.	XR serves as representation—a constructed version of history that reflects contemporary choices about what is included or excluded. The simulated environment is not a direct record of the past but an interpretation that must be examined critically. As a relic, it is a product of its time, revealing how history is understood and recreated today.
Photographs	Provide direct visual evidence of a moment in time; Can capture historical detail not present in written sources	Can be staged, manipulated, or selectively framed; Lack broader context; May not convey the full story.	A photograph is a record of a specific moment but does not provide full context. It is a relic of the time in which it was taken, shaped by the photographer's choices, perspective, and intent. As a representation, it can be used to support different narratives depending on interpretation.
Documents (writ large)	Offer firsthand accounts, official records, and contemporaneous perspectives; Provide textual evidence that can be closely analyzed.	Require interpretation and corroboration; Often reflect the perspectives of the author or institution that produced them; may reflect the perspective of those in power rather than diverse voices	Documents serve as records of specific events, laws, and perspectives, but they are also representations of power, authority, and intention. They may function as relics when analyzed for their materiality, language, and historical usage.

Films	Engaging and narrative-driven; Can provide powerful visual and emotional connections to historical topics.	Often dramatized or fictionalized; Subject to directorial interpretation and political/cultural influences.	Films are representations of history, often shaped by storytelling techniques that prioritize narrative over accuracy. As records, they may capture cultural attitudes, political propaganda, or social concerns at the time of production. They can also be relics when studied as historical artifacts of media and memory.
Oral Histories	Provide personal perspectives and lived experiences; Can reveal voices and narratives often missing from official records.	Subject to the fragility of memory; Require corroboration with other sources; Limited by individual perspective.	Oral histories are records of personal experiences, but they are shaped by the act of remembering and retelling. As relics, they offer insight into memory, identity, and cultural transmission. As representations, they reflect both the individual's perspective and the historian's framing of the story.

As researchers, educators, and instructional designers, we assert that the classification of historical sources is not fixed, but shaped by the questions we ask—an essential distinction that must be explicitly taught to students as they engage in historical inquiry. Without this understanding, historical inquiry too often devolves into mere comprehension exercises, where students passively read texts and search for answers to teacher-given questions rather than engaging in the disciplined ways of thinking that define historical literacy as a *way of knowing and making sense of the past*. Too often, teachers rely on rigid definitions of "primary" and "secondary" sources provided in standards documents and frameworks, overlooking the crucial role of inquiry in making this determination. It is the nature of our questions—not an inherent characteristic of the source itself—that dictates classification.

Take, for example, a Virginia high school history textbook from the 1950s. If we ask, "What historical narrative were Virginia students taught about the Civil War and Reconstruction in the 1950s?", the textbook is a primary source, offering direct evidence of how history was framed at the time. However, if we ask, "What actually happened during the Civil War and Reconstruction?", the textbook functions as a secondary source, synthesizing and interpreting past events. And as a secondary

source, it would not be the most reliable or preferred source for answering that question—historians would instead turn to firsthand accounts, official documents, and contemporary records from the 19th century.

This same principle applies to XR experiences. If a simulation is used to understand a historical event, it may function as a secondary source, providing an interpretation of the past. However, if students analyze how an XR experience constructs historical meaning—what is included, what is omitted, and whose perspectives are represented—it becomes a primary source for studying historical memory and digital storytelling. To support this critical engagement, we have developed a framework for treating XR as a historical source within an inquiry. This includes examining:

- Production and Purpose—Who created the XR experience? What were their goals? What historical sources did they use?
- Plausibility and Place Illusion—To what extent does the experience create a sense of historical authenticity? What feels real, and why? What historical choices are being made to construct that realism?
- Reflections and Reactions—How does the experience shape historical understanding? What perspectives are missing? How does it compare to other sources? (Fitzpatrick et al. 2021).

Through structured inquiry, students can learn to analyze XR in the same way they examine documents, photographs, and films, recognizing that all sources carry perspectives, omissions, and interpretive choices. Our work underscores that XR, like all historical sources, requires critical analysis. While it provides new opportunities for spatial and immersive learning, it is not a neutral or transparent view of the past. It must be examined in terms of who created it, how it constructs historical meaning, and what questions it helps answer, or leaves unanswered. By integrating XR into historical inquiry, we help students move beyond passive consumption of digital experiences and engage in active interrogation of historical narratives. This approach ensures that XR, like other sources, is used not as a substitute for evidence, but as part of a broader, corroborated inquiry into the past. However, just as we scaffold students' ability to analyze traditional sources, we must explicitly teach them how to question XR, ensuring they develop the critical habits of mind necessary for disciplined historical inquiry.

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I am a Professor of History and Social Science Education in the School of Education, College of Liberal Arts and Human Sciences at Virginia Tech. My ultimate goal is to prepare teachers who are teachers of children first and history and social science second. I am interested in way too many things but currently gravitate toward research that is practically orientated in terms of how to scaffold inquiry-based learning using Gen AI (see https://genaiinhistoryeducation.com/), and also extended reality technologies to help young people visualize the past and make visible local hidden histories. My own professional development efforts have been focused on learning how to work in transdisciplinary teams and workflow practices–typically this begins with drinking beer (Body by Boddingtons).Outside of my professional pursuits, I enjoy swimming (I am a member of FAT–faculty aquatic team), kayaking (floating next to the kayak), and mountain biking (laying on the ground next to my bike)., I taught middle and high school history and social studies in England and then in upstate New York (Newfield and Oxford). I also taught in Job Corp (Oneonta) and later worked as a museum curator and educator.

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My research and publications focus on the use of virtual and augmented reality to enhance learning performance in several contexts, but primarily to expose learners to experiences that are otherwise inaccessible due to time, place, scale or other constraints. I am an associate professor in the University Libraries at Virginia Tech and the Executive Director of the Applied Research in Immersive Experiences and Simulations (ARIES) Program. ARIES supports applied research that brings together industry partners, faculty, and students interested in the cognitive and affective aspects of learning in immersive environments, games, simulations for training and performance support, and more. Through it, students discover, create and share their own work in the form of games, simulations, virtual and augmented reality experiences for learning and entertainment while having the informal interactions with interested peers, faculty, industry partners, and external researchers that are so valuable for student development

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Key Works:
How do we know what they know? A case study of classroom-based assessment with multilingual learners Link
A DBQ in a multiple-choice world: A tale of two assessments in a unit on the Byzantine Empire. Link