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To cite this article: Shantanu Tilak, Michael Glassman, Monica Lu, Ziye Wen, Logan Pelfrey, Irina Kuznetcova, Tzu-Jung Lin, Eric M. Anderman, Adriana Martinez Calvit, Kimiko Ching & Manisha Nagpal (2023) Investigating social studies teachers' implementation of an immersive history curricular unit as a cybernetic zone of proximal development, Cogent Education, 10:1, 2171183, DOI: [10.1080/2331186X.2023.2171183](https://doi.org/10.1080/2331186X.2023.2171183)

To link to this article: <https://doi.org/10.1080/2331186X.2023.2171183>



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Published online: 29 Jan 2023.



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Received: 31 October 2022  
Accepted: 15 January 2023

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## CURRICULUM & TEACHING STUDIES | RESEARCH ARTICLE

# Investigating social studies teachers' implementation of an immersive history curricular unit as a cybernetic zone of proximal development

Shantanu Tilak<sup>1\*</sup>, Michael Glassman<sup>1</sup>, Monica Lu<sup>1</sup>, Ziyi Wen<sup>1</sup>, Logan Pelfrey<sup>1</sup>, Irina Kuznetcova<sup>2</sup>, Tzu-Jung Lin<sup>1</sup>, Eric M. Anderman<sup>1</sup>, Adriana Martinez Calvit<sup>1</sup>, Kimiko Ching<sup>1</sup> and Manisha Nagpal<sup>1</sup>

**Abstract:** This qualitative study presents 27 students' insights about four teachers' implementation of an immersive Native American history curricular unit designed to equip students with digital skills to critically navigate complex, polarizing social issues. The Digital Civic Learning (DCL) curriculum used Google Suite and Google Classroom or Schoology to provide collaborative slides supporting immersive 2D-graphics, children's books/resources, immersive activities/artefact-creation, and multimodal tools (e.g., discussion posts, Flipgrid video-essays). Teachers regulated student thinking/behavior towards cohesive outcomes, and encouraged open-ended exploration, operationalizing the design framework as a zone of proximal development (ZPD). The history unit incorporates four cybernetic design features (DF) that enable teachers to steer student-centered collaboration within the curricular unit. The teacher serves four diverse roles (guide, facilitator, modeler, participant observer) mapping onto the DF. Results of focus group interviews with students, which were analyzed based on a theory-informed coding scheme and narrative inquiry, suggest ways for social studies teachers to operationalize the DCL immersive history unit as a cybernetic ZPD by adapting its basic structure to technologies accessible in their schools by adapting its basic structure to technologies accessible in their schools.

**Subjects:** Teaching & Learning - Education; Education Studies; Teaching & Learning

**Keywords:** technology; Native American history; Vygotsky; cybernetics

### 1. Introduction

As new information communication technologies (ICT) (re)create our social world (Tilak & Glassman, 2020), civic responsibilities and what it means to be an agentic citizen also morph. Online communication occurs through highly responsive tools, with algorithms rewiring behavior and interaction in unforeseen ways, sometimes producing polarization in sociotechnical systems. While grassroots #BlackLivesMatter protests organized through Twitter (Thelwall & Thelwall, 2021) exemplify transformative potentials of communication technologies, the emergence of conspiracy theories on Twitter, and also others like Telegram (Walther & McCoy, 2021) pose concerns. Kahne et al. (2016) suggest keeping abreast of hopes/dangers requires educational strategies to navigate complex, information-saturated realities. Classrooms can become safe, norm-driven spaces (Tilak & Glassman, 2020) that equip students with scientific/everyday skills to use technology to navigate

polarizing information streams and develop nuanced understandings of society (e.g., students engaging in citizen's journalism using personal devices to respond to localized incidents of racism; Gutiérrez et al., 2019).

We explore possibilities with these strategies through the example of the design/implementation of a technology-assisted immersive history curricular unit. Our approach may alleviate difficulties faced by educators with incorporating real-online informal experiences of children into socio-moral inquiry (Cohen et al., 2018) so they learn to navigate their own social realities. The cybernetic feedback loops of technology that change action/thinking influence this navigation (Tilak & Glassman, 2020). Cybernetics is a transdiscipline focusing on how complex systems (brains, organisms, societies, machines) evolve by reacting to dynamic social fields (school systems, classrooms, factories, organizations; Tilak et al., 2022). When applied to understanding technology usership, cybernetics may reveal how educators can operationalize responsive technologies to engender critical thinking in human-to-human collaboration/learning.

In this qualitative study, we rely on cybernetics and educational psychology (Tilak & Glassman, 2022) to provide practitioners with concrete techniques to design and implement immersive learning environments mirroring informal online experiences of students and provide them with an engaging narrative to interact with, to guide learning and encourage emotional and sensory submersion into stories/narratives to learn concepts (Enyedy & Yoon, 2021). While such environments are usually designed using high-tech tools requiring time/money investment (e.g., augmented and virtual reality), we utilize the idea that engaging stories and readily available tools can create equally productive knowledge-sharing behaviors (Cress et al., 2021). Current studies of immersive environments demonstrate how students engage in learning through collaborative navigation of simulations. An example is Lui and Slotta's (2014) EvoRoom, co-designed with high school biology students to understand mechanisms of rainforest evolution through construction of cladograms or diagrams used to decode relationships between local fauna facilitating ecological change. Moher et al.'s (2008) RoomQuake, which presents simulations of seismic waves through physical spaces, requires students to detect the waves' origin through collaboration. Other approaches include using moral simulations to design curricula on animal conservation, to heighten elementary students' knowledge of sustainability practices (Zhang et al., 2016).

Our study, derived from the federally funded Digital Civic Learning (DCL) Project extends studies of immersive learning into the social studies realm through a low-tech approach to learning Native American History. We suggest the history unit showcased in this study may be understood using Vygotsky's zone of proximal development (ZPD). In academic settings, the ZPD is usually regarded as the difference between academic work a child is not yet capable of doing independently and work the child can do with support from more experienced individuals (e.g., teachers, parents, more competent peers; Vygotsky, 1999). The teacher offers contingent support to groups/individuals to foster higher competence (Van de Pol et al., 2019). In student-centered, collaborative classrooms, the ZPD becomes a state and process allowing students to abstract scientific information provided by experts, and spontaneously collaborate to develop and recreate ideas based on their cultural histories. The ZPD can be understood as a mixture of integrated social/emotional/cognitive experiences of all agents in an environment (Glassman et al., 2022) that emerges in a field of mutual conversational feedback loops from a teacher, group(s) of trusted peers, or, today, even machines responding to users (e.g., algorithms/software producing online information streams). The important issue is the quality of conversations, and how affective, social and cognitive components interact in moving conversations towards higher-order thinking.

In the DCL history curricular unit, students' actions become enmeshed in conversations with each other, but the collaboration enters a dynamic conversation with the immersive story. The history unit becomes a cybernetic participant in learning; the teacher implements it as a dynamic experience. Individual students learn from each other, from the story presented by the unit, and adjust perspectives as the teacher narrates the story and steers interplay between students and

history unit. When collaborating, each individual learner may have their own understanding of formal scientific concepts, and spontaneously develop ideas based on individual and collective abstraction of content. Dilemmas may arise, creating a double bind (a concept popularized by cybernetician Gregory Bateson; Visser, 2003) that can be pathogenic when free exploration is discouraged/difficult; a common eventuality on the Internet; where illusions of the hyperbolic label of “post-truth” (a term originating from government subversion; not the Internet; Teisch, 1992) often leads to a depowering in the navigation of digital ecologies; adhering to a system of thought, or even escaping its boundaries can create punitive outcomes in this situation. However, when tools used in such contexts promote exploration/collaboration, critical thinking and emotional growth may emerge from negotiation of emotional/cultural differences and commonalities (e.g., creation of artefacts/projects, argumentation). Design prototypes afforded by immersive realities focused on social studies topics may help create contexts bringing groups of collaborating students into a ZPD encouraging such thinking/action through organic collaboration.

Our study focuses on whether students perceived the curricular unit as a ZPD that allowed cohesive multimodal learning products and open-ended collaboration to negotiate classroom concepts. We first outline the necessity for teaching/learning Native American history of tribes such as the Seminole and the Shawnee through a consideration of various moral standpoints, and describe the proposed mechanism through which technologies used in the immersive narrative offered in a ZPD. We map four curricular design features (DF) onto four features of educational psychologist Gordon Pask’s (1971) Cybernetic Theater, which could be used by actors and audiences to rewire play plotlines with an interpreter’s assistance. Pask’s approach, which relies on Vygotsky’s theory (see, Tilak & Glassman, 2022) can help understand how immersive realities act as cybernetic ZPDs, where teachers, students, and curricula interact to guide an ongoing story and engage in problem-solving. We describe how teachers played four roles in implementing the framework, akin to the interpreter in the Cybernetic Theater. We analyze student focus groups using a qualitative coding scheme developed from Pask’s DF, and examine whether students perceived teachers implemented the curricular unit within the design framework.

## 2. Theoretical framework

### 2.1. *Critical thinking and teaching Native American history*

Teachers often lament the problematic representation of cultural identity in education/society. Educators and researchers often suggest teachers adopt constructivist approaches to help students discuss these issues, to help students to consider new ways to solve problems that society has faced through history (Malott et al., 2009). Native American history is one such contentious topic. Racialization/politicization may trivialize experiences of marginalized communities. One-dimensional understandings of events like the Trail of Tears, and laws like the Indian Removal Act, that led to confiscation of lands inhabited by Indigenous nations, may present a partisan view. If a social studies teacher presents historical information without opportunity for conjecture, they may not encourage critical thinking. Present cultural markets also propagate imagery adopting biased interpretations of Native Americans. The Braves, Redskins, and automobile monikers like the Jeep Cherokee, are some examples.

With the Internet’s rapid evolution to serve cultural markets, technological information feedback loops may reorient information we are provided to match polarized, stereotyped ideologies, through product placements and ads, designed to reverse engineer human activity (Tilak & Glassman, 2020). We aim to help social studies educators and students navigate these feedback loops as active agents through opportunities for cyclical social experimentation (Gutiérrez et al., 2019) and development of solutions to social issues offered by the technology-assisted DCL history unit, which was constructed from insights about elementary schoolers’ online experiences.

### 2.2. *Conceptual basis for technology in the immersive history unit*

To spur higher-order argumentation related to issues of Native American land rights of the Sioux, Seminole and Shawnee, we considered an approach employing immersive graphics and multimodal

educational tools like discussion boards and video-essays to supplement small-group discussions. Traditional role-playing wherein students assume roles of Native Americans would risk trivialization/cultural appropriation of trauma faced by minority communities, outlined by scholars in social studies education as a problematic tendency of cultural motifs in the contemporary age (Krueger, 2019). Accordingly, we developed a time-traveling narrative based on the movie, *Bill and Ted's Excellent Adventure*, wherein students become agentic observers of history, allowing students to embody their own identities and participate in the immersive reality without assuming roles of communities facing hardship. The 10-day curricular unit involved students being warped to the past to gather insights about and discuss possible solutions to settler expansion into indigenous lands in the 1800s, related issues from the 1800s, and contemporary struggles like protests at Standing Rock in opposition to the construction of the Dakota Access Pipeline. The turn-based (taking turns agentially changing a narrative) and deductive (making decisions based on existing/unfolding information) nature of the immersive narrative was driven by students' reported interest in gaming titles like *Roblox*, and *Among Us*, and the team's experience with titles like *Dungeons & Dragons*.

We created an armature of tools readily accessible in schools that could allow the internalization of scientific concepts/curricular information, and their reappropriation through collective activity, where each student/group views ideas through the lens of their cultural experience. Google slides became our medium to provide information to students; immersive graphics, short stories focusing on important Native American heroes of the Shawnee and Seminole tribes, and articles were shared in audiovisual forms through the presentation software, embedded into the LMS (Learning Management Systems, like Schoology and Google Classroom). This allowed the teacher to provide readings, resources, and facilitate story narration, enriching the class with scientific concepts. Vygotsky 2017 suggests scientific concepts are imparted to students through schooling and education, while everyday concepts are created through the reappropriation of scientific knowledge in complex social fields.

While information uptake of scientific concepts from resources allows different levels of awareness of social studies, organic collaboration is needed to reappropriate ideas and create innovative solutions to social issues; to initiate learning within the ZPD. We designed the curricular unit such that students responded to the immersive narrative using text (discussion boards allowing free-form writing; Cox & Cox, 2008) and video posts (through Flipgrid to elicit visual, verbal, tonal, and affective cues; Miller et al., 2020), and used ideas discussed asynchronously to augment face-to-face small-group discussions (Gillies, 2019). The team designed interactive graphics and activities to tap into students' standpoints about Native American culture through tinkering (DiGiacomo & Gutiérrez, 2016) with artefacts (simulations of land, culinary practices, livelihoods, struggles initiated by colonial treaties), allowing agency as time-travelers to develop deeper emotional connections (Enyedy & Yoon, 2021) with curricular content. Collaborative opportunities presented by the history unit were designed to allow reappropriation of ideas in small groups and facilitate learning within the ZPD.

While multimodal tools we use are amenable to open-ended discourse, they provide students direction to create cohesive learning products and express thoughts and emotions, performing a self-regulatory mechanism by offering a fixed variety to students to externalize ideas (Järvelä & Hadwin, 2013). Moreover, discussions are contextualized, by the teacher and curricular resources in the DCL, to problems faced in Native American history; to guide organic collaborative problem-solving. The teacher who implements the history unit would need to regulate learning and model ongoing discourse as the history unit's narrative unfolds and provide input and support to small-group argumentation. We suggest this framework resembles a ZPD allowing negotiation of scientific/everyday concepts.

### **2.3. The immersive history curricular unit as a cybernetic ZPD**

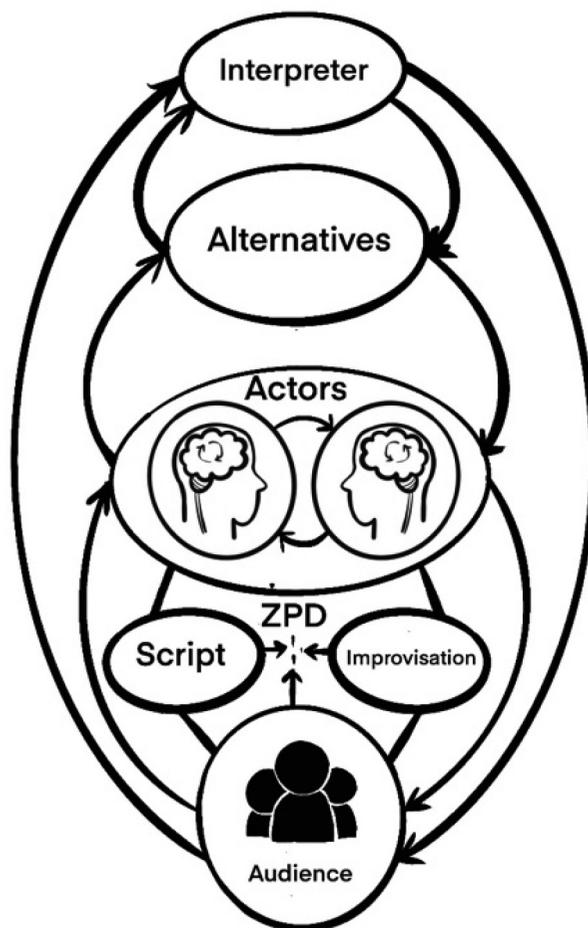
The design armature of the DCL can enable teachers to shepherd student behavior and interaction towards well-defined learning products, and open-ended collaboration. These qualities may help

foster student learning within a ZPD (Stahl & Hakkarainen, 2020). The narrated simulation of a time-traveling story implicitly rewires learning, with students' responses to the narrative providing cues to the teacher to model instruction and assist small-group collaboration. Rather than acting as a mediating tool, the history unit becomes a surrogate cybernetic participant in learning (Scott, 2021). The teacher streamlines the interplay between the students and immersive story. The Cybernetic Theater forms a metaphor to understand functionalities of the DCL history curricular unit.

Pask (1971) relies on Vygotsky's ideas about exteriorizing mental models through paired experiments. In the 60s, Pask worked with theatre director Joan Littlewood, to undercut power structures in performances, proposing to craft the Cybernetic Theater. Pask wanted to facilitate ongoing conversations between actors, audiences and backstage staff using responsive technology to co-construct artistic expression, and knowledge. He proposed a system with buttons on each audience member's seat, asking for preferences regarding the play's plot (Pask, 1971). Audience choices would be communicated to interpreters backstage, who relayed information to actors via earpieces. Actors could choose to imitate the script, or improvise to recreate the plot (Figure 1).

The choice presented to actors in the Cybernetic Theater aligns with Vygotsky's (1999) understanding of Diderot's Paradox, which suggests an actor's ZPD lies at the juncture of scientifically reproducing scripts and spontaneous improvisation resulting from accumulated sociohistorical experience or *perezhivanie* (Michell, 2016). Pask outlines four design features (integrating cognitive, social-cognitive, and constructivist psychological approaches commonly

Figure 1. Cybernetic Theater.



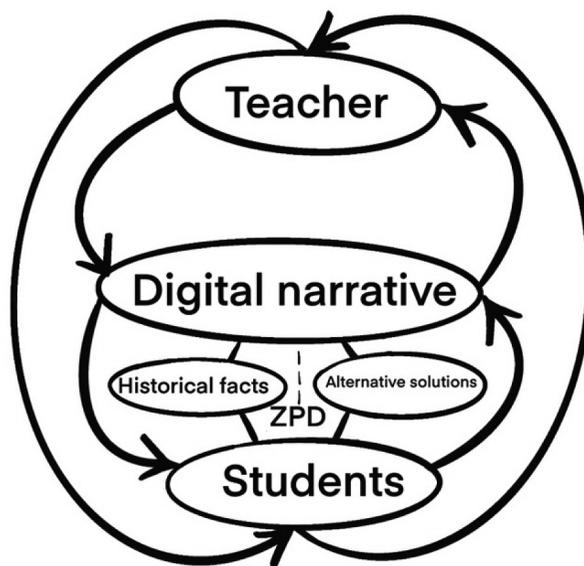
used to study technology-mediated collaboration; Stahl & Hakkarainen, 2020) that may enable technologies to elicit agentic collaboration lying within the ZPD (Tilak & Glassman, 2022). In Table 1, we describe four DF of the Cybernetic Theater, and parallel functionalities of the technology used to design the immersive history curricular unit.

Characters in the story functioned like actors, with students functioning as audience members toggling the story through artefact creation and argumentation. Teachers acted akin to interpreters of student activity, performing diverse roles to operationalize the four DF, and strengthen student-curriculum interactions when needed, to provide information and guide student knowledge, tell the story and facilitate agency through the immersive narrative, and model/observe collaborative projects and discussions (Figure 2). This configuration maps directly onto the Cybernetic Theater’s layout, offering possibility to apply Pask’s cybernetic approaches to theatre and educational psychology to classrooms. The interpreter in the Cybernetic Theater highlights the role of the cybernetic “steersperson” who aids in cohesive audience-actor navigation of the “river” of the performance.

**Table 1. Comparison between the Cybernetic Theater and the DCL history unit**

DF	Feature	Cybernetic Theater	Immersive History Curricular Unit
DF1 Controllable Variety	Based on Bandura’s self-regulation (Bandura, 1993, p. 131). Variety of technologies or features should match tendencies of users, to regulate behavior and interaction to meet certain standards.	The Cybernetic Theater offers audiences options to change play plotlines to match their thinking, maintain engagement, and allows actors to produce performances per an audience’s preferences.	Web tools (immersive artefacts on Google Slides, discussion boards, and Flipgrids) offer controllable variety to regulate behavior towards cohesive learning outcomes.
DF2 Information to Abstract	Technology should offer knowledge for uptake, supplementing existing schemas.	The Cybernetic Theater offers the audience narratives or content through plays rehearsed/improvised by actors, depending on cues relayed by interpreters and audience input.	Online resources and short stories shared using Google Slides and LMS provided scientific information to link to known concepts.
DF3- Tacit cues to derive agency	Technologies should offer cues to elicit action from users.	The Cybernetic Theater allows audiences to express thoughts about play plotlines and modify them. It provides actors with similar agency, enabling improvisational performances. The interpreter becomes a mediator between audience and actors.	Immersive activities and dramatic narration through audio and graphics on Google Slides facilitate student action as time-travelers.
DF4 Opportunities for collaboration	Critical discourse, with human-machine interaction spurring human-to-human collaboration.	Cybernetic Theater offers opportunities for ideological exchange between audience members regarding preferences and where they see the plot going, and between actors, in putting on an improvised show to resonate with audience input, relayed by the interpreter.	Small-group discussion questions, discussion board/video-essay prompts, and immersive narratives spur small-group discussions.

Figure 2. The DCL as Cybernetic Theater.



Just like the interpreter in the Cybernetic Theater, teachers implementing the DCL guide currents of student-curriculum inquiry towards cohesive learning outcomes by operationalizing four interconnected roles in the classroom.

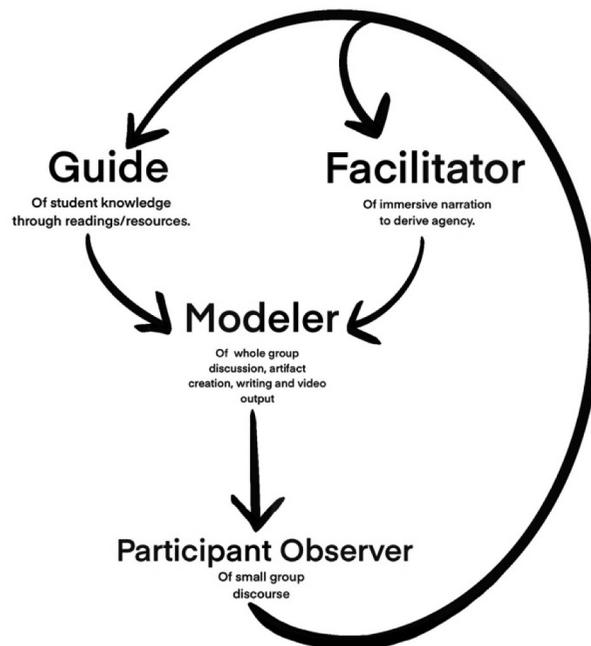
#### 2.4. Role(s) of the teacher

The design features of the immersive history curricular unit enabled teachers to serve four diverse instructional roles. The time-traveling story that offered tacit cues for agency (DF3) to students required teachers to become **facilitators** narrating the story of treaties and agreements presented to Native American tribes and sought students' opinions for resolution. As students engaged with the land simulation and artefact creation, the teacher could alter storytelling depending on responses. Teachers would begin each class in the whole group, spurring a discussion of articles and online resources that accompanied the curricular unit and tell the time-traveling story. This was done to allow each student to abstract information (DF2) and provide tacit cues (DF3) to help students establish connections with the story. The teacher first acted as a **guide** presenting information/readings and the **facilitator** of the immersive narrative to spur student agency. When students broke into small groups, they would create artefacts (posters, concept maps) to share ideas about issues being discussed in our slide decks. Asynchronous posts and recorded video-essays enabled students to have some autonomy (providing controllable variety) and choice in expressing ideas. Teachers gauged the variety of agency, matched by the curricular multimodal tools (DF1) to different degrees through allowance for expression via text and video. They accordingly **modeled**/shaped further decisions made in discussing the narrative/resources.

After viewing individual contributions/artefacts, teachers supported collaboration among students (DF4). Whole group discussions and artefact creation culminated in small-group Collaborative Social Reasoning (CSR; Lin et al., 2022) on day 3 and day 9, requiring teachers to become **participant observers** of small-group discourse and listen to standpoints about land rights issues and solutions to them, providing occasional support to expand ideas. Students would weigh diverse standpoints about treaties/land rights issues in small groups. CSR has been shown to increase elementary schoolers' socioemotional and academic learning. Teachers' roles are shown in Figure 3.

These four roles mapped onto the DF: the guide (DF2), facilitator (DF3), modeler (DF1), and participant observer (DF4). By implementing the curricular unit following the DF, teachers acted akin to the interpreter in the Cybernetic Theater, in creating a ZPD. To investigate potential for

Figure 3. Teachers' roles.



teachers to implement the DCL history unit by operationalizing these four roles within the outlined design framework, we analyze student perceptions of the curricular design framework, obtained from deductive coding of focus groups, and elaborate results using a narrative inquiry design approach. We ask two exploratory research questions:

**RQ1:** *What views do elementary students participating in The DCL history curricular unit express about learning social studies issues through an immersive approach?*

**RQ2:** *How can teachers' implementation of the DCL history curricular unit foster critical thinking within a ZPD?*

### 3. Methods

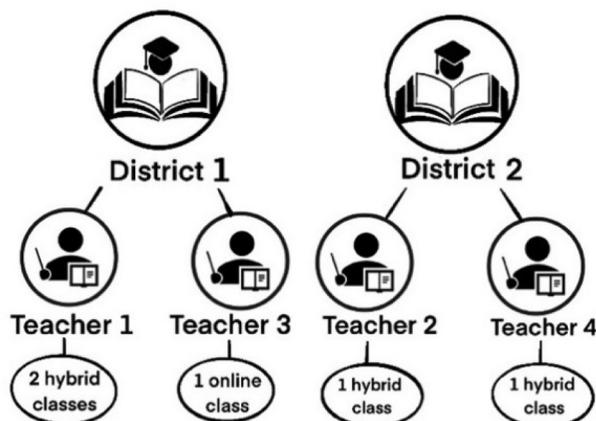
#### 3.1. Data

This study was part of a four-year research project aiming to improve elementary school students' thinking and reasoning about provocative social studies issues through technology-assisted collaboration. The project commenced during COVID-19, forcing K-12 learning settings to adopt hybrid and online instruction (Adedoyin & Soykan, 2020). After the DCL history curricular unit was administered over 2 weeks across 5 classrooms (taught by 4 teachers), focus groups were conducted with groups of students from each classroom 1–2 weeks after implementation. Focus groups allow collaborative, ongoing understanding of learning experiences (Vaughn et al., 1996). Each interview forms the unit of analysis. Data were transcribed using Otter.ai and fed into NVivo12 for coding.

#### 3.2. Participants

The history unit was conducted across five classrooms (led by two 4<sup>th</sup> and two 5<sup>th</sup> grade teachers) comprising 87 students (58% 4<sup>th</sup> grade; 48% girls; 59% White, 22% Black, 14% Asian, 5% Multiracial) from two Midwestern districts (School Districts 1 and 2). Three 4<sup>th</sup> grade classrooms and two 5<sup>th</sup> grade classrooms participated. Sixty-one percent of students from District B and only 4% in District 1 qualified for free/reduced lunch. Teachers 1 (who had 25 years teaching

Figure 4. Sample.



experience, and taught two hybrid 4<sup>th</sup> grade classes), and 3 (who had 18 years teaching experience, and taught one 5<sup>th</sup> grade class online) belonged to District 1. Teachers 2 (who had 15 years teaching experience and taught one hybrid 4<sup>th</sup> grade class) and 4 (who had seven years teaching experience and taught one hybrid 5<sup>th</sup> grade class) belonged to District 2 (Figure 4). Focus groups were conducted with four to six students per class (total of 27), representative of gender, achievement, and race/ethnicity.

### 3.3. Curriculum

We designed three curricular units iteratively throughout an academic year. The first focused on immigration issues and used a traditional approach to collaboration involving children's books, discussion boards, video-essays, and online resources, not supplemented by immersion. The second and third were immersive, focused on Native American history and food security, guided by moving stories to help students develop deeper connections to content. These units were designed after seeing lower engagement with our first non-immersive, argumentation-based unit, and asking students about the online cultural tools they used, with gaming communities like *Roblox*, and social deduction games like *Among Us* being the most popular. We partnered with teachers to redesign each unit based on teacher and student feedback. Our study focuses on student reports of functionalities of the first immersive unit, to understand whether the initial design prototype of this new approach offered a ZPD. The 10-day curricular unit employed multi-modal technologies to spur collective ideation about Native American history.

#### 3.3.1. Technology toolkit

The history unit was adapted to fit within the learning management systems (LMS) used by the school districts, making technologies readily accessible. District 1 used Schoology, while District 2 used Google Classroom. Google Slides was used to create slide decks (with readings, stories, immersive activities) offering scientific concepts to students to grapple with and remix in their small groups. Flipgrid allowed video-based responses to discussion questions, and discussion boards (the in-house Schoology blog for District 1, and Fanschool for District 2) let students express views in writing, regulating behavior and expression. District A used Microsoft Teams for video-conferencing, while District B used Zoom/Google Meet (see, Figure 5).

Activities/resources were supplemented by audio, interactive graphics (made using Procreate® for the iPad), and immersive activities allowing students to assist with farming on Native American Land, learn traditional recipes, and pick habitable dwellings during time-travelling expeditions. These activities (Figure 6) enabled students to embed their thinking/action into the bounds of a simulated reality, where issues about Native American history were collaboratively exchanged to create new perspectives. We suggest cyclical reappropriation of concepts spurred by course organization software (Google Slides, Schoology, Google Classroom), and collaborative

Figure 5. Technologies.

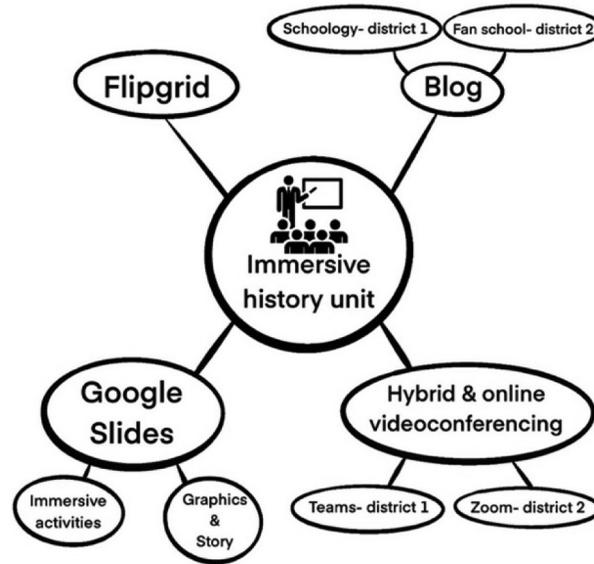
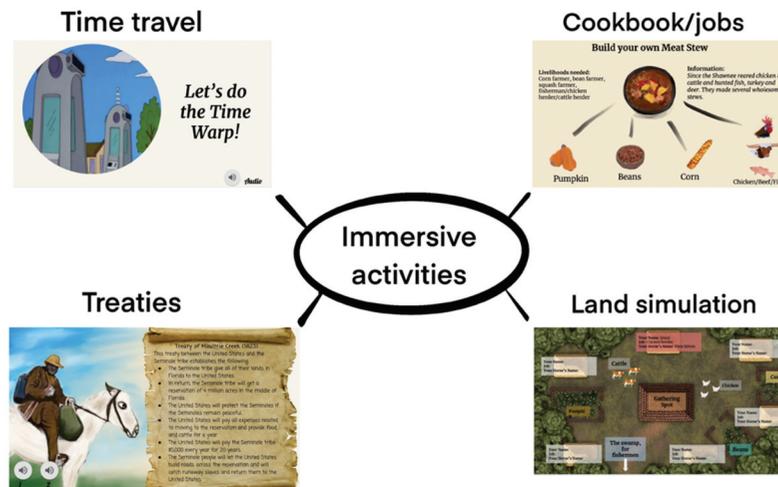


Figure 6. Immersive activities.



technologies/activities (discussion boards, Flipgrids, immersive activities and CSR) can facilitate learning within the ZPD.

In the **Appendix**, we provide a detailed guide of step-by-step activities implemented by teachers to operationalize this design framework.

### 3.4. Analytic approach

Focus group interviews were conducted one to two weeks after implementation. Questions focused on design of the history unit and students' experiences learning content and engaging in collaboration. We used a deductive coding scheme based on Pask's design features to understand whether students reported teachers' use of webtools in the design framework cybernetically guided learning and fostered spontaneous, open-ended collaboration within a ZPD. Two raters coded the five interviews in NVivo12 to compute utterance coverage of students discussing teachers' implementation of each DF. We used narrative-inquiry design (Connelly & Clandinin, 1990), to construct chronological explanations of how students perceived learning in the DCL from coded interviews.

### 3.5. Coding scheme

We used a deductive (Bingham & Witkowsky, 2021) coding scheme derived from the Cybernetic Theater's constraints to define our framework:

- (1) **Controllable variety**- This dimension identified features of curricular tools used; ability to write discussion posts, record video-essays, work in groups, create idea maps, which provided requisite variety to learners produce well-defined responses; and for teachers to **model** classroom activity.
- (2) **Information to abstract**- This category was used to identify student uptake of reading materials and videos provided through teacher guidance and information provision.
- (3) **Tacit cues to derive agency**- This dimension was used to identify engagement with the teacher's facilitation immersive activities designed to spur emotional responses and experiential learning.
- (4) **Opportunities for collaboration**- This category was used to identify instances of student discourse during small-group CSR, which teachers **observed and supported**.

Two raters used selected excerpts from four interviews to create a codebook. They coded the remaining interviews (20% of the dataset) simultaneously to test interrater reliability. Kappa values ranged between 0.70–0.99 (Table 2), indicating substantial to almost perfect agreement (O'Connor & Joffe, 2020).

Below, we provide coding results, accompanied by a narrative inquiry to examine whether students perceived the history curricular unit could be implemented as a ZPD.

## 4. Results

In our focus groups, students expressed that narration of the immersive unit focusing on Native American land rights enabled them to embody active agents in a new reality. They suggested immersivity engendered deeper understandings of provocative sociohistorical issues by allowing active observation and critique of historical events. Students in Teacher 1's classroom suggested:

S1: *I thought it was very realistic. It felt like we were in it.*

S2: *Yeah, it felt like you were there."*

Students had varied opinions about design features that guided teachers to serve four diverse roles to guide activity towards productive collaboration. We construct a narrative inquiry of interviews, and provide utterance coverage for each DF of a ZPD.

### 4.1. DF1-controllable variety

Varied curricular components, like discussion boards, stories/narratives, small-group discussions, and video-essays were perceived by students as matching their needs and guiding their behavior, thinking and affect/expressiveness towards adaptive outcomes to different degrees. Operationalizing the variety of the multimodal tools required teachers to carefully understand how to model classroom behavior and student expression based on ongoing preferences (Table 3 displays utterance coverage).

Table 2. Kappa values

DF	Kappa
Controllable Variety (DF1)	0.88
Information to abstract (DF2)	0.90
Tacit cues to derive agency (DF3)	0.99
Opportunities for collaboration (DF4)	0.70

**Table 3. Utterance coverages- DF1**

Classroom	DF1
T1-ClassA	27.4%
T1-ClassB	28.34%
T2	14.18%
T3	10.71%
T4	18.71%

In Teacher 1's two hybrid classrooms, a considerable proportion of utterances discussed a variety of provided technologies (27.4% in Classroom A, and 28.34% in Classroom B). While some students in these classrooms suggested they enjoyed expressing ideas in writing on the discussion forum, others suggested that teachers may need to provide students' clear instructions to respond to others. The lack of this compulsory response made them enjoy the ongoing, in-class small-group discussions more. One student expressed this:

*"I liked the online talking more than the discussion boards. It's an actual conversation that we can't really have if we're just in the classroom, and in online conversations, we're not really getting ideas across, because most of the time we're not reading other people's discussion posts. That's not something that Teacher 1 assigned."*

Preferences seen for technologies varied across and within classrooms. Students from Teacher 3's fully online classroom (whose focus group showed an utterance coverage of 10.71%) expressed limitations with recording Flipgrid video-essays, owing to others watching in the videoconferencing call and difficulty in preparing time-sensitive scripts to record videos:

*S1: I wasn't a big fan of Flipgrid.*

*Interviewer: The Flipgrid? Can you tell me more about that?*

*S1: For some reason I got nervous when I had to do it in the call.*

*Interviewer: Oh okay, that's understandable. Do others have similar feelings?*

*S2: I don't know. I like Flipgrid. And I feel when I'm in the lesson, I know what I'm going to say. But when I end up doing it, I forget everything. I guess it's kind of my fault. I should just write down what I want to say. But, I mean, I don't have a problem with the Flipgrids. I always wrote down my ideas for Flipgrid. But I don't like the time limit, I get nervous when I'm timed."*

In the focus group with students from Teacher 4's classroom (showing 18.71% coverage), run in a hybrid format, participants reported issues with home and school Internet connectivity, which limited their use of both the discussion board and the video essay software. Students discussed these technical issues that limited variety offered by the history curricular unit as follows:

*S1: Sometimes Fanschool didn't work at all. You couldn't post anything. You couldn't look at this thing. As a medium I prefer Fanschool but it didn't work.*

After hearing limitations students reported with the discussion forum, the interviewer delved deeper to ask about connectivity issues, which prompted the same student to outline limitations faced:

*Interviewer: I was curious if you all had technology issues? Could you tell me a little more about that?*

*Student: Only one or two times, my computer just froze. But one of the times, just for a couple seconds. And other times it froze for a long time, 10 minutes.”*

While some students preferred typing over recording videos to express ideas, others were more familiar with talking to online audiences, using gaming platforms like Twitch (a popular live-streaming website). An example from the focus group conducted with students from Teacher 2’s hybrid classroom (showing 14.18% coverage) reflecting the role played by activity in larger online sociotechnical systems in recalibrating behavior:

*Interviewer: So many of you didn’t like the Flipgrid. Why not?*

*S1: Because we had to-*

*S2: I don’t like recording. Sometimes I stumbled on the words.*

*S1: I think you could just hit delete too.*

*S3: Um, the Flipgrid didn’t bother me. Because I’m using Twitch almost every day, so it’s nothing new to me.”*

Students in online and hybrid classrooms reported varying opinions about the curricular webtools’ capacity to guide individual/group activity towards adaptive learning outcomes. While some preferred to record videos, others preferred writing on the discussion board, and engaging in small-group discussions. While the variety offered by the curricular unit matched students’ preferences to varying degrees, it was seen they appreciated teachers offering them autonomy to express ideas and create products of learning in ways they were most comfortable with by **modeling/** regulating classroom interactions and carefully gauging students’ responses.

#### **4.2. DF2-information to abstract**

Teachers reviewed content with the class, and then conducted whole group discussions debriefing texts before students began small-group argumentation. The students reported that teacher-provided resources enabled them to gain basic awareness of issues faced by Native Americans and form conceptual links with other cultural phenomena they were aware of (Table 4 displays utterance coverage). These can be considered as scientific concepts in the ZPD.

Students exhibited various levels of understanding and abstraction related to teacher-provided content. Focus group participants from Teacher 1’s classrooms (with the interviews showing 10.28% and 7.58% coverage) suggested they were able to understand broader ideas and values about racism and the equal treatment of individuals of varied cultural origin through embracing differences. When asked about they learnt from the unit, students said:

*S1: Um one thing is to not treat people by their skin color, treat ‘em badly, and hurt them just because of their skin color.*

*S2: Yeah, I feel we learned a lot about equality during the two units. Yeah, I agree. It’s just better to respect everybody.*

**Table 4. Utterance coverages-DF2**

<b>Classroom</b>	<b>DF2</b>
T1-ClassA	10.28%
T1-ClassB	7.58%
T2	8.63%
T3	11.58%
T4	3.6%

Participants from Teacher 4’s classroom (whose interview displayed 3.6% coverage) reported more direct, simple interpretations of content, saying that they were able to learn about issues, rather than explaining links they made to their own ideas about race:

S1: *I like the Native American unit. It was more interesting. We learnt how they had to give up their land and all that different stuff.”*

Descriptions of student experiences with readings and video resources suggest they interpreted knowledge provided by teachers to different degrees of abstraction (from simple knowledge uptake to making connections to abstract cultural phenomena). Most were able to gain basic awareness of provocative sociohistorical issues related to Native American land rights, meeting standards mandated by state-level educational policies.

#### 4.3. DF3-tacit cues to derive agency

The history unit comprised an ongoing narrative revolving around time-travel to enable students to become active observers of history. We created immersive activities (a cookbook simulation, a farming simulation, and sequences outlining colonial invasions, in line with the online gaming experiences several students reported enjoying) to derive agentic interactions that prompted students to engage with the curricular unit and produce viable solutions to Native American land rights issues. Students reported that teachers facilitated narration of the immersive story to spur agency for artefact creation in an ongoing manner (Table 5 displays utterance coverage).

Participants from Teacher 1’s second classroom appreciated the immersive narrative (33.34% coverage). They suggested the story of time-travel narrated by the teacher treated them as part of the historical period (the 1800s, and 2016), dynamically observing issues faced by Native Americans firsthand and developing empathy with their experiences and hardships. On day six, we provided a scenario wherein indigenous lands where students “lived” as visiting time-travelers are occupied by settlers/military agents. These cues produced emotional responses from students:

S2: *... we got to pick out our pets, the food, our jobs. That was super cool, that made it more meaningful because half of that got taken away.*

S3: *I would also choose the Native American unit, because I thought it was so fun, because we got to choose our jobs and all that, like what Student 2 said. It was fun to travel back in time and to speak up, tell people how we feel about these things.*

S2: *I also think it became more meaningful, because it was more fun. And when it got, like, taken, one half of it got taken away, we kind of got to feel how it felt for the Native Americans.*

In the interview conducted with participants from Teacher 2’ s classroom, students displayed lower utterance coverage (8.12%) and spoke more about information offered by the curricular unit, but suggested immersive activities (e.g., picking which houses to live in, and which farming and hunting/gathering jobs to help the tribes with) enabled them to become motivated to engage in agreement/disagreement with one another and establish social norms:

Table 5. Utterance coverages-DF3	
Classroom	DF3
T1-ClassA	15.85%
T1-ClassB	33.34%
T2	8.12%
T3	21.21%
T4	6.77%

S1: *I like where we had the houses and jobs. That was a fun activity.*

Interviewer: *Nice. I'm glad.*

S2: *I like that part, too. We had to disagree or agree on who would get what, I wanted to be a fisher."*

Participants from Teacher 3's online class (who displayed 21.21% coverage) had not had the opportunity to meet one another in the physical classroom. They suggested engaging in immersive activities with peers, like the 2D-land simulation, which offered students more autonomy to create shared languages and projects not only enabled enjoyment in learning, but also enabled deeper bond formation with classmates:

S1: *Well, I loved doing the um breakout rooms and I also enjoyed doing the concept map and the villages. I felt that was a lot of fun. I love social studies a lot more!*

S2: *Yeah, I agree with you, S1. It was fun. I liked the roleplaying because I liked how we got to know our classmates better from it.*

From our explanation of student experiences engaging in agentic activity spurred by cues of the immersive narrative, we infer students appreciated teachers' dynamic narration of an ongoing story and **facilitation** of artefact creation, as it allowed them to develop the agency to discuss their ideologies within a controlled educational space. Higher-order thinking within the ZPD originates from externalized social agency (Tilak & Glassman, 2022) within the sociohistorical approach.

#### 4.4. DF4- Opportunities for collaboration

The underlying goal of the immersive history curriculum, through provided resources, immersive activity, and different platforms to guide student behavior, was to prompt students to engage in free-flowing discussions or CSR, exchanging ideologies related to provocative sociohistorical issues through small-group talk and asynchronous posting (Table 6 contains utterance coverage). During these discussions, teachers supervised as **participant observers**, and interjected to prompt further questioning, or to clarify students' doubts.

Focus group participants from Teacher 1's second classroom (1.63% coverage) only had a few insights into the creation of social norms through small-group discussions adhering to the rules developed at the start of the unit by the whole class:

S1: *If there were three alternatives, everyone will say, do this and not that. The others would then say yes or no, or I will go next, and then others say what they think. If I want to say something first, I can say so.*

In the focus group conducted with participants from Teacher 2's classroom (5.76% coverage), students suggested writing on the discussion board allowed both agreements and disagreements in a structured manner, while the synchronous small-group discussions that were observed by teachers allowed them to speak from their hearts and express their ideas:

**Table 6. Utterance coverages-DF4**

Classroom	DF4
T1-ClassA	13.5%
T1-ClassB	1.63%
T2	5.76%
T3	15.81%
T4	5%

S1: *I liked the Fanschool most because, unlike the Flipgrid you didn't have to record yourself saying stuff. You could just type it out. And you could agree with people.*

S2: *My favorite part was (that I was able) ... to speak from my heart, because most of the people in my small group were my friends.*

Participants from Teacher 3's online class (15.81%) expressed appreciation to be able to interact and exchange ideas, owing to lack of in-person interaction, and targeted teacher modelling in the online class owing to group discussions being conducted one by one in the presence of the teacher on the videoconferencing software. Those preferring to mull over ideas chose to use the discussion forum or post video-essays:

*Interviewer: Our face-to-face discussions on teams, either in our small groups or as a whole class for our discussions on the Schoology. What do you all feel about that for this unit?*

S1: *I don't really mind it. I don't feel nervous to have my camera on or to discuss different things with other people. I don't really mind that. I really enjoy meeting new people and learning about them. Especially from the past learning about that, because everything that we learned about in Immigration and Native Americans, mostly, I didn't even know. This was all very new, and I really liked it.*

*Interviewer: Does anyone have any other thoughts?*

S1: *I liked the blog where we typed it because I never really got the turn to talk in our meetings.*

*Interviewer: Oh okay. I see.*

S2: *The whole group meetings, sometimes it's hard to get everyone's opinion.*

*Interviewer: Do other people feel that way?*

S4: *Yeah, I feel some people couldn't talk because other people are talking by then. I feel like that, but my small group did good on choosing who to talk with.*

S2: *Yeah, when we're in smaller groups, we have different things to talk about. And it's just that we're more engaged than the same person talking over and over.*

In the focus group with students from Teacher 4's classroom (5% coverage), students had limited insights regarding the potential of the curriculum to engender civic discourse. We suggest this may have been owing to network issues reported that may have limited student-centered discussion the use of technologies, and teacher involvement. While students did say they appreciated abilities to expressively interact with classmates, they did not elaborate upon how they created social norms or how whole-group and small-group discourse differed:

S3: *I like the Native American one because we got to work together. It was fun, disagreeing and agreeing with my classmates.*

Insights from interviews suggest students (sometimes to a limited extent owing to connectivity issues) perceived the curriculum allowed opportunities for collaboration, with the teacher's supervision as a participant observer, to produce well-defined learning outcomes within the design constraints of the web-driven immersive reality we created using interactive graphics, PowerPoint presentations, time-travel-based activities, video essay software and discussion boards.

## 5. Discussion

Our results suggest that students were able to follow the immersive narrative of the history curricular unit, and collaboratively develop nuanced solutions to social issues using multimodal online tools. Regarding elementary students' views about participating in the history unit, while some students (e.g., those in Teacher 4's classroom) had more surface-level understandings of content provided by teachers as **guides**, others linked content to popular culture and sociomoral issues. Our findings extend research in immersive learning (Lui & Slotta, 2014; Moher et al., 2008) by focusing on sociomoral issues and fostering students' critical thinking to negotiate these ideas from varied and nuanced standpoints. By participating in a simulated environment where teachers

acted as **facilitators** narrating an ongoing story, students felt empathy for the Seminole/Shawnee upon passage of the Indian Removal Act, the Trail of Tears, and the construction of the Dakota Access Pipeline, and even understood these perspectives from the standpoint of economic development. Tacit cues provided by the narrative gave students ways to share ideas, emotionally connect to the narrative (a salient part of immersive learning; Enyedy & Yoon, 2021) and build knowledge to prepare for CSR. Students expressed how they formed deeper connections with stories read and through discussions. Learners found synchronous discussions and immersive activities helpful in bond formation with peers.

The autonomy for multimodal expression (in synchronous conversation, through asynchronous discussion posts, video-essays) helped students organize learning behaviors and interactions into varied but cohesive trajectories matching their preferences/variety (Ashby, 1956) for synchronous and asynchronous interaction (Gillies, 2019; Miller et al., 2020), allowing teachers to **model** ways they presented information so students would remain engaged. While students in hybrid classrooms (Teachers 1, 2, and 4's classes) expressed different preferences for Flipgrid and discussion forum modalities, students in the online classroom preferred talking about their ideas and posting to the discussion board due to affordances of videoconferencing limiting Flipgrid use. Students suggested there was scope for collaborative argumentation arising from the design framework, wherein teachers served as **participant observers** offering occasional support.

Teachers' implementation of the design framework operationalized the four constraints of a cybernetic ZPD for students. The contingent support of the teacher was provided by observing the interaction between the small groups and the narrative as a homeostatic whole (Pask, 1971), rather than solely guiding immediate activity of a single group at a given time (Van de Pol et al., 2019). Our findings, based on utterance coverage and narrative elaboration of affordances of a designed ZPD conceptualized by Gordon Pask, addressed how teachers implemented the immersive history curricular unit to foster critical thinking within a ZPD. By providing important texts/resources, teachers offered students information to abstract and **guide** their ideas by connecting it to different facets of their lives or understanding scientific concepts more directly. By **modeling** students' activity and expression based on previous responses, teachers met variety needed by students to navigate the curricular unit. By **facilitating** narration of ongoing struggles of Native American land rights to impassion students, teachers provided tacit cues for agency and empathy to solve problems observed in the story and spur artefact creation. By acting as **participant observers** of small group-discussions and using insights produced from observation to inform further narration/modeling, teachers enabled students to iteratively recreate their ideas.

## 6. Limitations

Our study, conducted during COVID-19, was implemented in four hybrid classes and one online classroom. The heightened competence students displayed with technologies may arise from adaptation to an online format with time owing to COVID-19. Two different Learning Management Systems (LMS) (Google Classroom and Schoology) were used by teachers. While students did not express explicit opinions about LMS, more specific questions may provide insights into user experiences across different tools. Students' limited insights about features of the curricular unit and its immersive/collaborative capacities in Teacher 4's class may relate to connectivity issues in student reports rather than nature of teacher implementation. However, results may also be related to Teacher 4 having less teaching experience than other participants.

The history curricular unit was implemented across two diverse districts by four teachers. Differing degrees of expression for each DF outline how the ZPD might be highly context-specific at the group and individual level. However, since the design features found considerable expression across interviews there is potential for the curricular unit to be tailored to local settings (e.g., fitting the curricular unit within an existing toolkit of technologies used by schools) to serve as a ZPD.

## 7. Future directions

The design framework in this study is part of an ongoing development project wherein our research team creates partnerships with students and teachers in designing curricula. Each unit, including the history unit presented in this study were redesigned based on student and teacher insights. Some future changes to the history unit include incorporating choice of modality for expression (a Flipgrid or discussion board response following CSR), and alterations in the content across fourth/fifth grade curricula. Further quantitative research from the developmental phase of our project can help teachers understand whether classroom and district-level differences in socioeconomic status and achievement might explain variations in students' learning. Quality of group activity may be assessed through social network analysis (which visualizes interactions between interacting agents), to provide practitioners insights about efficacy of the history unit to heighten collaborative agency in the social studies classroom. Ensuing research activities involve a quasi-experimental trial accompanied by a business-as-usual condition to ascertain whether the curricula developed foster critical thinking about social studies.

## 8. Conclusion

Our qualitative study aims to inform practitioners/researchers about designing and implementing an immersive history curricular unit designed to teach Native American history to function as a ZPD. We provide four suggestions for practice. The first would be to understand popular culture/online recreation students engage with, and design curricula to resemble these experiences, so students learn to navigate real-life information landscapes mindfully. The research team accounted for this by adding turn-based /deductive elements based on games like *Roblox*, and *Among Us*. The second suggestion is creating organic connections between online resources, children's books, and popular culture. The team relied on the time-travel simulation, a trope used in popular science-fiction films like *Bill and Ted's Excellent Adventure*, and weaved together articles, videos, and storybooks that could be mapped onto time-travel sequences. The third is taking an immersive narrative and providing students with multiple opportunities for expression (through video, text, artefact creation), using readily accessible technologies. Our team employed tools like Google Slides, Flipgrid, and educational blogs, readily accessible in participating school districts, and crafted immersive graphics using iPads. The fourth is giving students agency in small-group argumentation, and supporting discussions dynamically, understanding previous contributions/artefacts, and how the whole class responds to readings/texts. Our study illustrates how social studies educators can supplement technological toolkits and information-based learning about social issues with immersive environments to spur new solutions to social issues that society has faced in the past.

### Acknowledgements

This research was supported by an Innovation and Development grant (R305A200364) from the Institute of Education Sciences (IES). We are grateful to our project team members, our district partners, and the students and teachers who contributed data to this study. Correspondence concerning this article should be addressed to Shantanu Tilak (tilak.6@osu.edu).

### Funding

This work was supported by the Institute of Education Sciences (IES) [R305A200364].

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### Disclosure statement

No potential conflict of interest was reported by the author(s).

### Citation information

Cite this article as: Investigating social studies teachers' implementation of an immersive history curricular unit as a cybernetic zone of proximal development, Shantanu Tilak, Michael Glassman, Monica Lu, Ziye Wen, Logan Pelfrey, Irina Kuznetcova, Tzu-Jung Lin, Eric M. Anderman, Adriana Martinez Calvit, Kimiko Ching & Manisha Nagpal, *Cogent Education* (2023), 10: 2171183.

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## **Appendix Curriculum Guide**

A guide was created for every teacher with detailed instructions in chronological order and shared via Google Slides and Google Docs, highlighting where they would need to model whole group sessions, provide readings and resources, observe small group interactions, and gauge student writing and video-essays to model further discussions. Over 10 days, the immersive simulation progressed iteratively. Students were “warped” back to the 1800s, and began to observe the livelihoods and culture of the Shawnee and Seminole tribes. Content was crafted based on Ohio’s standards for 4<sup>th</sup> and 5<sup>th</sup> grade history. Letters from colonists marked the passage of varied treaties that led to compromising agreements affecting Native land rights. On Days 3 and 9, students consolidated their ideas and engaged in small group discussions, followed by posting to the discussion board or to the Flipgrid platform. After Day 6, students were warped to the future to observe phenomena related to the construction of the Dakota Access Pipeline on lands of the Sioux. On Day 10, students compiled their ideas and possible solutions related to Native American land rights issues through an argumentative writing task. A detailed curricular guide recounting day-by-day activities is provided in this appendix, in [Table A1](#).

Table A1. Curriculum guide	
Day	Grade 5 (Seminole)
Day 1	<p style="text-align: center;"><b>Grade 4 (Shawnee)</b></p> <p><b>Guide &amp; Discuss Class Norms</b> Provide ground rules and social norms for our class.</p> <p><b>Provide &amp; Discuss Read Aloud as Guide</b> Tecumseh Chapter 1</p> <p><b>Facilitate narration of Time Warp</b> We're in the Ohio of the 1800s</p> <p><b>Observe &amp; Participate in Small Group Activity</b> Narrate: The Shawnee welcome you. Welcome to the Guild house! Ask the students to work in their groups and pick their livelihoods and homes on the land simulation.</p> <p>The Elders have found a litter of Puppies. We get to pick a pet and choose their names.</p> <p><b>Day 1 Activity</b> Record a Flipgrid, introducing yourself, your job, and your dog's name. Also, describe the village you are in. (Show Group join code in Flipgrid)</p> <p>(View students' artefacts, and <b>model</b> further discussions)</p>
	<p><b>Guide &amp; Discuss Class Norms</b> Provide ground rules and social norms for our class.</p> <p><b>Provide &amp; Discuss Read Aloud as Guide</b> Osceola Chapter 1–2</p> <p><b>Facilitate narration of Time Warp</b> We're in the Ohio of the 1800s</p> <p><b>Observe &amp; Participate in Small Group Activity</b> Narrate: The Seminole welcome you. Welcome to the Guild house! Ask the students to work in their groups and pick their livelihoods and homes on the land simulation.</p> <p>The Elders would like you to have a horse to ride out through the swamps. Pick your pet.</p> <p><b>Day 1 Activity</b> Record a Flipgrid, introducing yourself, your job, and your horse's name. Also, describe the village you are in. (Show Group join code in Flipgrid)</p> <p>(View students' artifacts, and <b>model</b> further discussions)</p>

(Continued)

Table A1. (Continued)	
Day	Grade 5 (Seminole)
Day 2	<p style="text-align: center;"><b>Grade 4 (Shawnee)</b></p> <p><b>Provide &amp; Discuss Read Aloud as Guide</b>                      Tecumseh Chapter 2–4</p> <p><b>Prompt &amp; Observe Small Group Activity</b>                      Narrate the Cookbook activity                      Tell student small groups to pick a recipe that they can cook based on the jobs they chose last time.                      (View students’ artefacts, and model further discussions)</p> <p><b>Facilitate narration of Treaty of Fort Wayne, 1809</b>                      Narrate the treaty using audio functionality/reading aloud.</p> <p><b>Challenge yourself (Optional Activity)</b>                      How do you feel about the Treaty signed at Fort Wayne? Post your thoughts to the discussion board.</p>
Day 3	<p><b>Provide &amp; Discuss Read Aloud as Guide</b>                      Osceola Chapter 3</p> <p><b>Prompt &amp; Observe Small Group Activity</b>                      Narrate the Cookbook activity                      Tell student small groups to pick a recipe that they can cook based on the jobs they chose last time.                      (View students’ artefacts, and model further discussions)</p> <p><b>Facilitate narration of Treaty of Moultrie Creek, 1823</b>                      Narrate the treaty using audio functionality/reading aloud.</p> <p><b>Challenge yourself (Optional Activity)</b>                      How do you feel about the Treaty of Moultrie Creek? Post your thoughts to the discussion board.</p> <p><b>Provide Small Group Discussion (CSR)</b>  <b>Prompt &amp; Observe Discussion</b>                      Some Seminole and other Tribal Nations cooperated with the government to end further conflict, and some did not because they did not want to leave what they cared about, their homes, culture and land.                      Would you be willing to give away something that you care about to end conflict?</p> <p><b>Observe Concept Mapping</b>                      Ask students to break into small groups and do the concept mapping activity with group members.                      (View students’ artefacts, and model further discussions)</p>

(Continued)

Table A1. (Continued)	
Day	Grade 5 (Seminole)
Day 4	<p style="text-align: center;"><b>Grade 4 (Shawnee)</b></p> <p><b>Provide &amp; Discuss Read Aloud as Guide</b> Tecumseh Chapter 5–6</p> <p><b>Provide &amp; Discuss Video Material as Guide</b> War of 1812 video</p> <p><b>Facilitate narration of the War of 1812</b> Narrate the messenger's news to students using audio functionality/reading aloud.</p> <p><b>Provide Discussion Post Writing Prompt</b> Would you be willing to give away something that you care about to end conflict? How would you react if your home (dog, pets) was taken away by someone who you were unfamiliar with?</p> <p><b>Sentence Starters</b></p> <ul style="list-style-type: none"> <li>• I would be/would not be willing to _____ because _____</li> <li>• I think/don't think that _____</li> <li>• I am confused because _____</li> <li>• I would feel _____, because _____</li> </ul> <p style="text-align: center;">(Read students' posts, and <b>model</b> further discussions)</p>
	<p style="text-align: center;"><b>Grade 5 (Seminole)</b></p> <p><b>Provide &amp; Discuss Read Aloud as Guide</b> Osceola Chapter 5–6</p> <p><b>Provide &amp; Discuss Reading as Guide</b> The timeline of the wars inflicted upon the Seminole nations</p> <p><b>Facilitate narration of Treaty of Payne's Landing, 1832</b> Narrate the treaty using audio functionality/reading aloud.</p> <p><b>Provide Discussion Post Writing Prompt</b> Would you be willing to give away something that you care about to end conflict? How would you react if your home (horse, pets) was taken away by someone who you were unfamiliar with?</p> <p><b>Sentence Starters</b></p> <ul style="list-style-type: none"> <li>• I would be/would not be willing to _____ because _____</li> <li>• I think/don't think that _____</li> <li>• I am confused because _____</li> <li>• I would feel _____, because _____</li> </ul> <p style="text-align: center;">(Read students' posts, and <b>model</b> further discussions)</p>

(Continued)

<b>Table A1. (Continued)</b>	
<b>Day</b>	<b>Grade 5 (Seminole)</b>
Day 5	<p style="text-align: center;"><b>Grade 4 (Shawnee)</b></p> <p><b>Provide &amp; Discuss Read Aloud as guide</b> Tecumseh Chapter 7</p> <p><b>Provide &amp; Discuss Video Material as guide</b> American Indian Removal</p> <p><b>Prompt &amp; Observe in Small Group Activities</b> Narrate to students that Tecumseh's death has led to some homes being forcefully taken. Choose 1 type of crop/animal to keep and who is going to be roommates.  (View students' artefacts, and <b>model</b> further discussions)</p>
	<p><b>Provide &amp; Discuss Read Aloud as guide</b> Osceola Chapter 7–8</p> <p><b>Provide &amp; Discuss Video Material as guide</b> American Indian Removal</p> <p><b>Prompt &amp; Observe in Small Group Activities</b> Narrate to students that Osceola's imprisonment and death has led to some homes being forcefully taken. Choose 1 type of crop/animal to keep and who is going to be roommates.  (View students' artefacts, and <b>model</b> further discussions)</p> <p><b>Provide Challenge yourself (Optional Reading) as guide</b> Osceola Chapter 9</p>

(Continued)

Table A1. (Continued)	
Day	Grade 5 (Seminole)
Day 6	<p style="text-align: center;"><b>Grade 4 (Shawnee)</b></p> <p><b>Provide &amp; Discuss Video Material as guide</b> How Catahecassa Fought Removal</p> <p><b>Facilitate narration of the Indian Removal Act</b> Narrate the treaty using audio functionality/reading aloud and inform the students that they are being forcibly removed from their land.</p> <p><b>Observe &amp; Participate in Small Group Activity</b> Ask students to work on the updated land simulation to choose which resources and homes to keep.</p> <p><b>Provide Discussion Post Writing Prompt</b> Is it okay for the government to take away what you care about for what they think is greater good?</p> <p><b>Sentence Starters:</b></p> <ul style="list-style-type: none"> <li>• I think it's okay/not okay, because _____</li> <li>• I agree/disagree because _____</li> <li>• What if _____</li> <li>• I wonder _____</li> </ul> <p>(Read students' posts, and <b>model</b> further discussions)</p> <p><b>Facilitate narration of Time Warp</b> We are being warped back to the future!</p>
	<p style="text-align: center;"><b>Grade 5 (Seminole)</b></p> <p><b>Provide &amp; Discuss Video Material as guide</b> How the Seminole Fought Removal</p> <p><b>Facilitate narration of the Indian Removal Act</b> Narrate the treaty using audio functionality/reading aloud and inform the students that they are being forcibly removed from their land.</p> <p><b>Observe &amp; Participate in Small Group Activity</b> Ask students to work on the updated land simulation to choose which resources and homes to keep.</p> <p><b>Provide Discussion Post Writing Prompt</b> Is it okay for the government to take away what you care about for what they think is greater good?</p> <p><b>Sentence Starters</b></p> <ul style="list-style-type: none"> <li>• I think it's okay/not okay, because _____</li> <li>• I agree/disagree because _____</li> <li>• What if _____</li> <li>• I wonder _____</li> </ul> <p>(Read students' posts, and <b>model</b> further discussions)</p> <p><b>Facilitate narration of Time Warp</b> We are being warped back to the future!</p>

(Continued)

Table A1. (Continued)	
Day	Grade 5 (Seminole)
Day 7	<p style="text-align: center;"><b>Grade 4 (Shawnee)</b></p> <p><b>Provide &amp; Discuss Video/Read-Aloud as Guide</b>  <b>Video:</b> Standing Rock  <b>Article:</b> Pros and Cons of the Pipeline</p> <p><b>Provide Flipgrid Prompt</b>            What similarities do you see between 2016 and the 1800s? Post your responses to Flipgrid (Show Group join code in Flipgrid) (View students' videos, and <b>model</b> further discussions)</p> <p><b>Provide Challenge Yourself (Optional Reading) as Guide</b>  <b>Article:</b> NEWSELA- Native Americans at Standing Rock want more fair treatment</p>
Day 8	<p style="text-align: center;"><b>Grade 5 (Seminole)</b></p> <p><b>Provide &amp; Discuss Video/Read-aloud as Guide</b>  <b>Video:</b> Standing Rock  <b>Article:</b> Pros and Cons of the Pipeline</p> <p><b>Provide Flipgrid Prompt</b>            What similarities do you see between 2016 and the 1800s? Post your responses to Flipgrid (Show Group join code in Flipgrid) (View students' videos, and <b>model</b> further discussions)</p> <p><b>Provide Challenge Yourself (Optional Reading) as Guide</b>  <b>Article:</b> NEWSELA- Native Americans at Standing Rock want more fair treatment</p> <p><b>Provide &amp; Discuss Read Aloud as Guide</b>            Young Water Protectors</p> <p><b>Provide Discussion Post</b>  <b>Writing Prompt</b>            Some government officials agreed to stop the pipeline, and some did not. What suggestions would you give the government to help them decide?</p> <p><b>Sentence Starters</b></p> <ul style="list-style-type: none"> <li>• I would suggest _____</li> <li>• The government should _____ because _____</li> <li>• They should _____</li> <li>• I need more information on _____</li> </ul> <p>(Read students' posts, and <b>model</b> further discussions)</p>

(Continued)

Table A1. (Continued)	
Day	Grade 5 (Seminole)
Day 9	<p style="text-align: center;"><b>Grade 4 (Shawnee)</b></p> <p><b>Provide Small Group Discussion (CSR)</b>  <b>Prompt &amp; Observe Discussion Discussion Prompt</b>                      How would you advocate for yourself if something you care about was forcibly taken away from you?</p> <p><b>Prompt &amp; Observe Concept Mapping</b>                      Ask students to break into small groups and do the concept mapping activity with group members.</p> <p>(View students' artefacts, and <b>model</b> further discussions)</p>
Day 10	<p><b>Provide Small Group Discussion (CSR)</b>  <b>Prompt &amp; Observe Discussion Discussion Prompt</b>                      How would you advocate for yourself if something you care about was forcibly taken away from you?</p> <p><b>Prompt &amp; Observe Concept Mapping</b>                      Ask students to break into small groups and do the concept mapping activity with group members.</p> <p>(View students' artefacts, and <b>model</b> further discussions)</p> <p><b>Time Warp</b>                      Where are we? We're back in class!</p> <p><b>Provide &amp; Discuss Video Material as Guide</b>                      Misconceptions video from Teen Vogue</p> <p><b>Argumentative Essay Prompt</b>                      The US government did not consult the Sioux before approving the Dakota Access Pipeline; however, the treaty required that the government consult the Sioux tribe about projects in their land. Then the Sioux legally opposed the Dakota Access Pipeline. They said it goes against their treaty. Is it ever okay to break any treaty? If so, when would it be okay and why?</p> <p><b>Tell Hint:</b> Use your old ideas from the concept journal to write your final report.</p> <p><b>Optional:</b> Students' essays can be graded.</p>



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