



Review Article

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Leveraging Future Technology to Better Observe the Past: Examples of Generative Artificial Intelligence Use by Social Studies Teachers and Students

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Abstract

We present four vignettes about how high school social studies students, pre-service college students, university instructors of elementary social studies methods, and practicing public school social studies teachers use generative artificial intelligence (genAI). This paper provides evidence of genAI use in schools and reflects on teachers' and students' experiences to address issues presented by social studies teacher educators.

Keywords: Generative artificial intelligence; Artificial intelligence; Criticality

Introduction

Generative artificial intelligence (GenAI), like Chat Generative Pre-trained Transformer (ChatGPT) by OpenAI and Gemini by Google, has changed the education landscape. GenAI is identified as a subset of AI technology that creates new content that was learned from the data it was given or trained from [1]. The United States Department of Education [2] has even identified that more research needs to be conducted on genAI because of its possible positive and negative aspects to the education community. However, researchers have determined that these tools can be biased toward minority populations [3], create inaccurate information [4], and even develop inappropriate materials for students in the classroom [5]. Yet, we do not know how it is currently being used in social studies classrooms. This paper provides evidence of how teachers and students are using genAI so that we can cautiously consider what to do about it in the future.

We present four vignettes about how individuals use genAI, observations of high school social studies students, pre-service

college students, university instructors of social studies methods, and practicing public school social studies teachers. This paper provides evidence of what has been observed and reflects on the teachers' and students' experiences using these tools.

The data presented was collected during an IRB-approved investigation on observed genAI use in social studies classrooms by pre-service teachers and college instructors from 2023 to 2025. This paper gives a unique perspective by looking at both the student's point of view as well as the teacher's point of view to determine what should be considered when using genAI in our social studies classrooms.

Students' Point of View

As teacher candidates, we were able to observe high school students using genAI and experience using it as students in our history content courses. This provided us with a unique context, viewing high school students as a student ourselves and as a future teacher all at once. We, as pre-service teachers, are experiencing

and learning about genAI alongside the high school students in our practicum classes. As we spend time with students in the classroom, pre-service teachers are able to meet students where they are at while also recognizing the importance of keeping up with changing technologies. Our combined perspectives give us a unique view on genAI and allow us to experience the technology together, making our perspectives nuanced and critical.

Observations of High School Students

As a pre-service teacher, I had the opportunity to attend a mentoring session with four eighth-grade students. During these sessions, I get to know the students and appreciate that I can use some time to talk with them about their daily lives. There was one discussion we had surrounding genAI. They explained how they use it for homework, personal advice, shopping, and more. For example, one student asked ChatGPT to create a list of items she needed for her birthday party.

I was shocked and curious about how they were still able to use it as a tool despite the increasing restrictions that prevent cheating at their school. One student explained that by the time something becomes banned, there is already a new way for them to keep using it. For example, they were able to use Snapchat - My AI on their phones even when the school's computers blocked most AI tools. Even though the high school students used the AI regularly, they still shared a negative perspective on how it was affecting their own learning. One student stated that everybody uses it all the time and feared that no one would be able to figure out how to write or solve tasks on their own. During this conversation, the student explained that her classmates would go out of their way to find new AI resources to help them cheat on assignments and make them easier to complete rather than completing the work themselves. Spending time in the school environment as a pre-service teacher made clear to me the impact on school environments from the banning of AI, and also revealed the mixed opinions students hold about the place of AI in the classroom. From my conversation, I learned that my students viewed AI negatively despite using it in their everyday lives and considered the school's ban on AI tools justified.

These students described how they are on the cutting edge of the new technology. Educators in our current world have a duty to evolve and find ways to help students utilize technology as a resource, as opposed to punishing them for it. Students freely admit to using genAI, and this example proves how students are capable of finding an alternative resource when others become restricted. This puts pressure on educators to not only stay constantly aware of new technologies but also to ensure that students know how to be consciously aware of genAI's strengths and its limitations. Just as social studies educators would teach students how to examine a source for analysis, students must transfer this discernment to genAI technologies.

Observations of a University Student

Since this experience, I found myself looking back on my education and how much different it would have been if I had genAI as a resource for my learning. As a 2020 high school graduate, I saw the transition to online education firsthand, but I would have

never expected genAI to develop at the speed and complexity that it has since then. The first time I saw the benefits of genAI in the classroom was my sophomore year of college when a history professor introduced us to newly developed online tools that helped us formulate thesis statements and search for topics to do further research on.

To do this, my professor familiarized us with an online "thesis generator" produced by the University of Arizona's writing centre. This website uses a series of prompts to bring together all of the most important components that make up a strong thesis statement. After responding to each prompt, the generator would merge them to make up what would be the overall idea of a thesis based on what has been prompted. Because the generator takes what you put in and arranges it into the format of a short paragraph or long sentence, what is produced is not always completely accurate or applicable to each individual assignment. Despite this, the generator works as a strong starting point to organize thoughts and make sure that all important components are included, whether it is for a paper, poster, podcast, or more.

As a student, I appreciated using this tool. I was able to try new resources without being fearful about how the professor would react, and I was excited about putting my ideas together in what seemed to be an easier way than I ever had before. Using this website helped me build my skills in writing thesis statements by ensuring each important part is included. By finding ways to use this growing technology in the classroom in a positive way, my professor was able to help us develop stronger personal thinking skills, support us in finding ways to organize our thoughts, thus furthering our writing skills, and demystify the misconception that genAI is only a tool being used for plagiarism and cheating.

Teachers' Point of View

As a university instructor of elementary social studies methods, I have the opportunity to support future pre-service teachers in their social studies instruction using best practices suggested by the National Council for the Social Studies (NCSS), and I introduced genAI in my course to provide the pre-service teachers an opportunity to be critical of the tool through such a lens. These pre-service teachers have real-world experience and perspectives that help teacher educators like myself better understand the context of how genAI is being employed not just by them but also by current practitioners in the field.

Observations of a University Instructor

I created an in-class activity to develop appropriate skills and dispositions for the use of genAI. The intended purpose of the lesson was for students to evaluate the generated lesson plan for common misconceptions, oversights, and false narratives often found in elementary social studies education. Such negative aspects can usually be accounted for by commonly repeated misconceptions, lack of varying historical perspectives, and commonly-avoided controversial truths often associated with United States history.

The level of criticality fostered by this course can also be seen when examining its design and intent. The course emphasized

the College, Career, and Civic Life (C3) Framework [6] for Social Studies State Standards: Guidance for Enhancing the Rigor of K-12 Civics, Economics, Geography, and History. The C3 framework was developed by the NCSS and served as a major component of the course and its associated materials. The NCSS Inquiry Design Model (IDM) was also a major component of instruction, research, and student assignments [7]. The means by which to create and facilitate personally relevant, compelling, factual, and critically engaging social studies experiences served as the larger conceptual goal of the course.

Additionally, the course was designed to align with the NCSS National Standards for the Preparation of Social Studies Teachers [8]. The five core components of these standards are: content knowledge, application of content knowledge through planning, design and implementation of instruction and assessment, social studies learners and learning, and professional responsibility and informed action. With each of these standards, criticality is an important skill.

Prior to this activity, the class spent several weeks learning about the nature of social studies education in the United States.

This included an understanding of the systematic de-emphasis of social studies over other subject areas, the frequent absence of counter narratives to give fuller and more accurate depictions of historical events and figures, the reliance on master narratives and its "heroification" of historical figures, teaching strategies to emphasize engagement and critical thinking, and practical knowledge of content strands composing elementary social studies education. Students also completed projects and assignments to develop the skills needed to determine the explicit, implied, and missing information provided by state standards. All of this is to say that students began this activity with a robust background in criticality towards social studies concepts and how it is often traditionally taught.

For the activity, the class selected a second-grade history standard from the Virginia Department of Education's (VDOE) History and Social Science Standards of Learning. Additionally, a department-developed standard lesson plan template was provided for the genAI to structure the lesson. The standard, prompt, and generated lessons are as follows in Figure 1.

PROMPT: Using the attached Lesson Plan template, create a social studies lesson plan about the standard: The student will apply history and social science skills to describe the revolutionaries who fought for America's freedom (1764–1781), including, but not limited to

1. John Adams;
2. Benjamin Franklin;
3. Alexander Hamilton;
4. Patrick Henry;
5. Thomas Jefferson;
6. James Madison (known as the "Father of the Constitution");
7. Paul Revere; and
8. George Washington (known as the "Father of our Country").

CHATGPT RESPONSE:

ELEMENTARY EDUCATION LESSON PLAN TEMPLATE

LESSON AUTHOR:

GRADE LEVEL:

SUBJECT AREA: Social Studies

LESSON DURATION: XX minutes

LESSON DATE & TIME (if applicable):

LESSON TITLE/TOPIC:

Revolutionary Heroes: The Leaders Who Fought for America's Freedom (1764–1781)

LESSON RATIONALE AND CONTEXT:

This lesson introduces students to key figures of the American Revolution, focusing on their contributions to the fight for independence. By exploring their roles, students will develop a deeper understanding of leadership, perseverance, and patriotism. This lesson aligns with child development theories by engaging students in interactive and inquiry-based learning. It also builds on prior knowledge of colonial America and prepares students for future lessons on the U.S. Constitution and early government formation.

RELATED VIRGINIA STANDARDS OF LEARNING:

The student will apply history and social science skills to describe the revolutionaries who fought for America's freedom (1764–1781), including:

- John Adams
- Benjamin Franklin
- Alexander Hamilton
- Patrick Henry
- Thomas Jefferson
- James Madison
- Paul Revere

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OUTCOMES & ASSESSMENT

LEARNING OUTCOMES:

1. Identify key Revolutionary leaders and describe their contributions.
2. Analyze the impact of these figures on the American Revolution.
3. Compare and contrast the roles of different leaders.
4. Present findings on a selected revolutionary hero.

PLAN FOR ASSESSMENT:

- **Formative Assessments:**
 - Class discussions to gauge understanding.
 - Group activities analyzing primary source documents.
 - Exit ticket reflections (one key fact about each leader).
- **Summative Assessment:**
 - Student presentations on an assigned revolutionary figure.
 - Short quiz on key figures and their roles.

ASSESSMENT FEEDBACK AND REFLECTION:

Students will receive verbal feedback during discussions and group work. The teacher will provide written feedback on presentations and quizzes. Self-reflection activities will encourage students to evaluate their learning.

MATERIALS NEEDED:

- Biography handouts of each figure
- Timeline of the American Revolution
- Primary source excerpts (e.g., speeches, letters)
- Chart paper and markers
- Digital slides or videos (optional)

PREPARATION OF THE LEARNING ENVIRONMENT:

- Arrange seating to facilitate group discussions.
- Prepare visual aids (timeline, images of figures).
- Ensure access to technology for multimedia components.

LESSON PROCEDURE

Lesson Opening:

- Begin with a question: "What makes someone a hero?"

<ul style="list-style-type: none"> • Show images of the revolutionary leaders and ask students to predict their contributions. • Briefly introduce the American Revolution and why leadership was essential. <p>Learning Experiences:</p> <ol style="list-style-type: none"> 1. Mini-Lecture (10 min) – Provide an overview of the American Revolution's key figures. 2. Group Activity (20 min) – Assign each group a leader to research and present. 3. Primary Source Analysis (15 min) – Students examine and discuss excerpts from speeches or letters. 4. Timeline Construction (10 min) – Arrange leaders' contributions chronologically. 5. Exit Ticket (5 min) – Each student writes one key fact learned about a leader. <p>Lesson Closure:</p> <ul style="list-style-type: none"> • Recap contributions of each leader. • Discuss: "How might our country be different without these leaders?" • Preview the next lesson on the formation of the U.S. government.
<p>PLANNED SUPPORTS AND INCLUSIVE PEDAGOGY:</p> <ul style="list-style-type: none"> • Use visual aids and multimedia for diverse learners. • Provide scaffolded reading materials for varied reading levels. • Offer sentence starters for discussion and writing tasks. • Encourage peer collaboration for students needing additional support.
<p>WHAT COULD GO WRONG AND WHAT TO DO ABOUT IT:</p> <ul style="list-style-type: none"> • Students may struggle with primary sources – Provide simplified summaries. • Some students may not participate in discussions – Use think-pair-share to encourage engagement. • Time management issues – Have a timer to keep activities on track.
<p>This lesson provides an engaging, interactive approach to understanding the revolutionaries who shaped America's independence. Implication: one must have practical and detailed knowledge of a given subject or concept to have the level of criticality necessary to leverage gen AI as a meaningful tool</p>

Figure 1: Example of GenAI in University Social Studies Methods Classrooms.

presented to and considered by pre-service teachers during the course. Also, within each section of the lesson plan template, students had criticisms and suggestions for improving and legitimizing the materials for actual usage. The students observed that genAI did not provide the context and criticality they were capable of as pre-service educators.

Students noted the discrepancy between the best practices discussed during our course and what the genAI produced. For example, students noted the genAI only generated materials addressing the specific historical figures in the prompt. The standard for this activity leaves implicit space to include other relevant historical figures in addition to those specified in the standard. What's notable and relevant here is that all the mandatory historical figures are white males and indicative of the implicit reinforcement of master narratives with no consideration or inclusion of other voices and figures from the period. Preceding this activity, a common topic of our classroom discussions and research included master narratives, counter narratives, and the importance of providing voices other than the traditional, white male-only approach to United States history so commonly seen in state standards of learning. The genAI was oblivious to including counter-narratives to present a more factual, relatable, and relevant experience that we strive for in an inquiry-based classroom. Essentially, genAI can reinforce common shortcomings in social studies education and thus does not possess the knowledge, context, and criticality that a pre-service educator provides.

Some students drew connections between prompt engineering and how it could improve the genAI responses. However, one student noted that creating specific lesson plan components themselves would be faster since the genAI could not be critical enough to do so. During the activity, I overheard a student remark that genAI is like Wikipedia, and their tablemate added Pinterest. They noted that these resources could not be taken at face value. I found this observation interesting; Wikipedia and Pinterest have received controversy and criticism for their use among students. Yet, if we understand their limitations, they can serve a useful purpose. While we can draw parallels between how we easily aggregate and access information with these resources, many may not yet be aware of the limitations of genAI in helping them generate rich, accurate, factual course materials. The students observed that these resources all share the same limitations of true criticality. GenAI can only present, not critically curate.

Observations of a Practicing Teacher

As a pre-service teacher, I was able to observe a practicing teacher using genAI to highlight how this criticality was used in a high school social studies class, providing evidence as to how it could be seen in different levels of education. During one of my practicum placements in a seventh-grade social studies classroom, I was lucky enough to be paired with a teacher who had a spark for teaching history in new, creative, and inviting ways, which included

the use of genAI. I was excited to see this, as many students, including myself, had associated learning history with memorizing names, dates, and events for many years. Rather than focusing on these, my teacher was able to find a way to use genAI to simulate the lives of others, educating students not only on events but also on how people felt and handled different situations. My teacher was able to tie the events they were discussing to more prominent themes and concepts, deepening the students' learning and productively incorporating genAI.

The teacher I was working with was able to do this especially well during her lesson related to the Great Depression. While preparing, she used a genAI chatbot and prompted it to create a set of letters that would have been written during the Great Depression. She used the prompt "Write a letter from 1931, where a [person] that would write to [another person] about how life was like in [specific situation during Great Depression]." In doing so, she was able to generate many letters that resemble what would have been written between friends, family members, neighbours, school peers, and more. Prior to using them, the teacher reviewed and altered the letters to make them applicable to her learning goals and then used the letters to drive her lesson surrounding day-to-day life in the early 1930s. In class, students were grouped together and each given a set of letters to evaluate and respond to. The students in each group were visibly and instantly engaged with what they were reading and seemed to empathize with the people in their letters as many of them were people similar to them or like people they knew. While using direct primary sources can also achieve a similar goal, it is often very difficult for teachers to gain access to the records that would actually benefit their students. The use of AI in this situation aided the teacher in producing historically accurate fiction of secondary sources that directly applied to what the students were learning about.

General Observations Across the Data

As these are just examples of how genAI has been observed in schools, we know the data is not generalizable. However, it provides evidence of the existence of these tools in schools. Thus, they should not be ignored.

Speaking metaphorically, we could look at the discussion around sex education as a sort of analog for genAI. We choose this example not because it is also a controversial topic in education but because it is also one that has explicit implications for what teachers teach and what knowledge we facilitate for our students. Generally speaking, we can divide the argument into abstinence-only education or responsible use that addresses practical considerations. When looking at genAI, there are voices in upper education saying such technology has no place in institutions of knowledge, as it takes fundamental skills and seemingly automates them. On the other hand, we could view genAI as a rapidly evolving new form of digital literacy that needs to be contextualized to be used to support the intended education outcomes of our institutions.

All of this is to say that when we back ourselves into binary choices with certain often controversial topics, we lose sight of a very basic consideration: our students are already using genAI. As pre-service educators, we cannot allow ourselves to be facetious about the reality of the situation. GenAI is here right now, and we need our next generations of educators to know the dangers,

limitations, and practical uses of this technology.

To look at how one might consider a genAI's response to a prompt, let's think about it this way: You are a teacher, and you need to grade a pile of student responses. How does one do that? Do you start off with an answer key that is based on your knowledge and understanding of the subject? Do you know the areas in which you might grade differently based upon the context of your understanding? When someone takes a genAI-generated response and assumes that it is correct, it would be like the same teacher picking a random test out of the pile and then saying, "This is my key, and it is 100% correct." It is easy to see such a massive assumption made with this example. However, it does address the fundamental nature of how we should approach the use of genAI. Users must be able to position themselves as the expert when engaging with genAI. If you do not have the knowledge to grade it, then you should not be using it.

Many students are effective in using genAI to aggregate information, using the interface as a sounding board for ideas and as a general research tool to be used with other common online resources. While it must be recognized that genAI in the classroom has often been associated with academic dishonesty and environmental concerns since its release in 2022, those in the field of education have an opportunity to inspire students to learn in more thoughtful ways using the technology that is growing every day [9-11].

Acknowledgment

None.

Conflict of Interest

No conflict of interest.

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