The Democratization of AI and its Transformative Potential in Social Studies Education

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The COVID-19 pandemic, along with other disruptive events, has greatly accelerated the integration of artificial intelligence (AI) into the education system and shifted public perception of technology-assisted learning. As technology continues to advance at a rapid pace, the emergence of generative AI software has grabbed headlines around the world and become a hot topic in the education community. Generative AI, which includes computer-generated images, videos, and text, has sparked a range of reactions as it became freely available to the public and entered the mainstream.[1] While some educators view AI as a mysterious and magical realm, others have been quick to raise concerns about the potential threats to education and the risks to academic integrity through the use of AI-generated essays.

Rather than sounding bells of alarm over the demise of social studies education as we know it, we are curious about the ways next-generation AI applications like ChatGPT can revolutionize the way social studies is taught and learned. Although it may be challenging to predict how these innovations will develop and be used, it's crucial that we thoughtfully consider the potential of AI to address the challenges we face in social studies education and develop strategies for its effective integration into the classroom. This includes identifying the ethical implications of AI, its impact on assessment methods, and opportunities for collaboration between educators and technology experts. By embracing the potential of this digital innovation, we have the chance to showcase how social studies education can adapt and evolve to meet the needs of today's society.

What is ChatGPT

One such AI application that has the potential to revolutionize social studies teaching and learning is ChatGPT. This natural language processing (NLP) model uses machine learning techniques to generate responses to prompts in a conversational context. It is trained on a vast database of human conversations and can communicate in over 90 different languages.

Just a month after its release in November 2022, ChatGPT had already garnered one million users, mesmerizing them with its ability to understand and respond to a wide range of questions and prompts as well as generate responses that could fool even the most seasoned educator. Although ChatGPT can generate impressive output with its ability to contextualize and learn from the

information provided, the tool is not infallible. Frequent examples of fabricated responses and biased content have raised concerns about its use in academic settings.[2]

The Influence of Generative AI on Educational Practices

Throughout history, we have encountered transformative moments, such as the invention of the printing press, telephone, and integration of the Internet into education. Each one of these technological innovations was initially maligned for spurring social upheaval and yet each became a valued and ubiquitous resource for teaching and instruction. ChatGPT, like the telegram and telephone before it, is a disruptive technology that has the ability to change the way people learn, communicate, and conduct business.

Education has always experienced a lag between the introduction of new technology and its adoption, but with the rapid pace of AI developments, disruptions to traditional education approaches could lead the way to revolutionizing practices and speed up the pace of adaptation. For example, some teachers have started using ChatGPT to reduce their own workloads, trimming the time they spend on tasks like generating quiz questions, writing lesson plans, and designing rubrics.

ChatGPT is able to grade student essays using a rubric, saving educators time and providing objective and consistent grading. It also can be used to generate responses to student questions or prompts in real-time, offering additional support and guidance as students engage with course material. This can help students to better understand complex concepts and ideas and can also encourage them to think more critically about the material they are learning. Furthermore, ChatGPT can help identify patterns and areas where students are struggling, which can be used to provide targeted instruction and support. Additionally, ChatGPT can also be used to monitor student progress over time, which can inform decisions on how to adjust instruction to better meet student needs.

Primary grade teachers are using ChatGPT to identify common misunderstandings that children have regarding specific curriculum objectives. It

can provide information on how to address these misconceptions and can even suggest developmentally appropriate ways to introduce concepts and key vocabulary. Definitions of terms and child-friendly examples can help children understand discipline specific words. Guides for teachers have generated numerous strategies for optimizing ChatGPT to enhance teaching practices.[3]

ChatGPT and Academic Integrity

Academic integrity is a critical issue in education, and the rise of AI tools like ChatGPT has brought new challenges for educators. One of the major concerns is how to effectively assess students' knowledge and understanding, despite the use of advanced AI tools like ChatGPT.

Essay mills and other cheating services are already in use. ChatGPT is just another tool in the mix for those tempted to engage in academic misconduct.

Just a month after its release, school districts across the country had blocked ChatGPT from their school devices and networks, and some universities around the world shifted to in-class pen and paper exams to preserve academic integrity.[4] New apps and plagiarism-detection software have designed digital solutions to identify AI-generated material.[5] However, these are not foolproof, and users report mixed results. Banning the use of these tools may produce students who are better able to do more by hand; however, such students will be at a disadvantage in a workforce where peers are proficient in using AI. This creates a need for educators to adapt their assessment design to these new technologies.

After a bit of reflection, school bans are being modified; instead of prohibiting the use of digital tools, educators and students are being empowered to utilize these tools to enhance their learning experience. This requires a re-envisioning of the assessment process to accommodate AI and a shift in focus to authentic and process-focused assessment.

It is important for students to learn how to use these tools critically and responsibly, and this can only be accomplished through hands-on experience. As part of a lesson or assignment, ChatGPT can be used to generate responses to teachers' prompts, helping students practice their research

and writing skills as they assess the generated content for inaccuracies, identify biases in the representation of ideas, and check the sourcing of information.

While ChatGPT can assist students in the writing process by providing suggestions for grammar, style, and content, it is not a replacement for the critical thinking and analysis that is integral to the essay writing process. In order for students to effectively write essays in social studies, they need to analyze and interpret source material, form and defend their own arguments, and communicate their ideas effectively.

By engaging in a process of questioning and evaluating the responses generated by AI, students can hone their critical thinking abilities. It is important to encourage them to critically review ChatGPT's answers and provide rationales for why they believe the responses to be accurate or flawed. Through this process, students learn to evaluate the credibility and accuracy of the information they encounter, which includes identifying and analyzing sources, assessing the evidence and arguments presented, and evaluating the reasoning and logic used. This equips them with the ability to differentiate between credible and unreliable sources, and to identify and reject misinformation. This is particularly important in today's society, where access to information is abundant, but the quality and reliability of that information is questionable.

The five big ideas of AI in the AI4K12 guidelines.

Students may also learn how to enhance an AI-generated essay by providing more specific prompts to improve the output. Since ChatGPT is a highly adaptable language model, the quality of its responses is closely tied to the quality of the questions posed and the parameters set for the task. By reframing ChatGPT as a writing assistant and a tool to quickly design more personalized and interactive instruction, educators can optimize the learning experience for a constantly evolving world. Therefore, the question is not whether to use these tools, but how to adapt to their presence in the most effective way possible.

Societal Impact of AI
The societal impact of artificial intelligence is a crucial area of instruction for social studies education. The Artificial Intelligence for K-12 initiative (AI4K12) developed guidelines for teaching AI literacy in

K-12 classrooms, with a focus on the five "big ideas" of AI: perception; representation and reasoning; learning; natural interaction; and societal impact.[6] These guidelines serve as a framework for curriculum developers and educators, outlining the concepts, essential knowledge, and skills that students should learn at different grade levels.

AI technologies are rapidly changing the way we live, from revolutionizing how we work and communicate to shaping our travel and healthcare. However, we cannot ignore the potential harms that come with these advancements. For example, biases in data used to train AI systems can lead to unequal treatment of groups of people. That's why it's important to have open and honest conversations with students about the impact of AI on society and establish ethical guidelines for the development and implementation of AI systems.[7]

Several organizations have begun introducing lesson plans that engage students in considering the ethical implications of generative AI. For example, in the Bill of Rights Institute lesson "ChatGPT and How We Learn," students discuss the positive and negative effects of using AI-generated content in education. The *New York Times* Lesson Plan "Teaching and Learning in the Era of ChatGPT" invites students to freely access recent *New York Times* articles and reflect on the use of chatbots on education, as they create ethical guidelines for their use and explore AI-generated content in educational projects.[8] Social studies educators are also innovating practices and materials with the benefit of AI tools. For example, AI may improve the audio quality of historical primary sources, minimizing background noise and enhancing speech for easier student analysis.[9] Other ways that generative AI may be used with primary source material include:

- Text generation: AI models can be used to generate text that mimics the writing style of historical figures, allowing students to better understand the perspectives of people from the past.

- Transcription: AI can help transcribe historical documents and make them more accessible to students.

- Summarization: AI can be used to summarize historical texts, making it easier for students to understand the main ideas and events.

- Translation: AI can be used to translate historical primary sources from one language to another, making them more accessible to students who don't speak the original language.

AI4K12.org	Draft Big Idea 5 - Progression Chart		www.AI4K12.org

Big Idea #5: Societal Impact	AI can impact society in both positive and negative ways.	LO = Learning Objective: What students should be able to do. EU = Enduring Understanding: What students should know. Unpacked descriptions are included when necessary to illustrate the LO or EU	
Concept	**K-2**	**3-5**	**6-8**	**9-12**
AI & The Economy (*Effects on Employment*) 5-C-ii	**LO:** Describe some jobs that no longer exist due to advances in technology. **EU:** New technology changes the types of jobs that are available for people. **Unpacked:** The automobile reduced our reliance on horses, which eliminated jobs for farriers and horse trainers but created jobs for auto mechanics. Factory automation enabled mass production, which reduced the need for blacksmiths, yarn spinners, and weavers but created jobs for people who build and maintain the factories.	**LO:** Describe how a job will change due to the introduction of AI or robotic technologies. **EU:** As AI and robotic technologies are adopted in the workplace, the ways people perform their jobs will change. **Activity:** Students can read grade-appropriate articles that describe jobs being upated with the use of AI technologies and robots, e.g., warehouse workers working alongside robots.	**LO:** Predict a new type of job that might arise, or how an existing type of job might change or go away, as a result of the adoption of AI technologies. **EU:** Cultures change as new technologies are adopted, and as a result some types of jobs are reduced and new types of jobs appear. **Activity:** Develop a "job description" of the future for a given profession - what will working with AI and robotic systems look like? What skills will be required?	**LO:** Investigate the skills needed for AI-enabled careers. **EU:** AI-aligned skills will be relevant throughout the workforce, not just for programmers. Most types of work will involve some interaction with AI technologies. **Unpacked:** As new technologies are adopted, the nature of work will change over a person's lifetime. People can expect to learn continually throughout their careers. AI-aligned skills that are becoming important include: collecting and curating datasets for machine learning; interacting with intelligent agents that help people do their jobs; training robots to complete specific tasks; use of AI-powered creative tools for image creation and manipulation; and knowledge engineering for AI systems.
AI for Social Good (*Democratization of AI Technology*) 5-D-i	N/A	**LO:** Describe and use some of the AI extensions or plugins available in a programming framework familiar to you. **EU:** AI is becoming part of everyone's toolbox through extensions or plugins that support development of AI applications serving the needs of many different communities. **Unpacked:** Examples for Scratch include speech to text, text to speech, face recognition, sentiment analysis, question answering, and visual classifier extensions.	**LO:** Create a novel application using some of the AI extensions or plugins available in the programming framework of your choice. **EU:** AI is becoming part of everyone's toolbox through extensions or plugins that support development of AI applications serving the needs of many different communities. **Unpacked:** Examples for Scratch include speech to text, text to speech, face recognition, sentiment analysis, question answering, and visual classifier extensions. There is a similar list for MIT App Inventor. Calypso has many of these features built in.	**LO:** Create a novel application using some of the AI tools available in the programming framework of your choice. **EU:** AI tools are becoming commonplace and freely available, and can be used by people without advanced degrees or expensive equipment.
AI for Social Good (*Using AI to Solve Societal Problems*) 5-D-ii	**LO:** Describe how AI can be used to solve a societal problem **EU:** AI can be used to create a classifier that solves a problem important to society. **Unpacked:** Classifiers can be trained to distinguish wildlife from manufactured items, recyclables from non-recyclables, or healthy from diseased plants. **Activity:** Use an AI for Social Good application to contribute to a solution to a societal problem. **Resource:** Code.org's AI For Oceans - https://studio.code.org/s/oceans/	**LO:** Design a solution to a societal problem that makes use of AI technology **EU:** AI is being used to solve societal problems such as environmental protection, energy conservation, and improved public health.	**LO:** Research a societal problem and describe how AI technologies can be used to address that problem. **EU:** AI technologies for perception, reasoning, and machine learning can be applied to many types of societal problems. **Resources:** UN's 16 Sustainable Development Goals - https://sdgs.un.org/goals Google's AI for Social Good page https://ai.google/social-good	**LO:** Evaluate an AI for Social Good project in terms of the problem it is addressing and the project's actual or potential impact. **EU:** "AI for social good" is the use of AI technologies to solve societal problems. **Unpacked:** "Social good" or common good seeks to provide the greatest benefit to the greatest number of people, to make the world a better place. This includes goals such as energy conservation, environmental protection, protection of endangered species, better public health, and prevention of human trafficking. **Resources:** Google blog post on social good projects: https://blog.google/technology/ai/30-new-ai-for-social-good-projects/ Nature article on AI for social good: https://www.nature.com/articles/s41467-020-15871-z

Big Idea #5 (Societal Impact) in the AI4K12 guidelines.

- Image captioning: AI can be used to automatically generate captions for historical images and photographs, providing context and background information for students.

- Interactive visualizations: AI can be used to create interactive visualizations of historical events, allowing students to explore and understand complex historical phenomena in a more engaging and interactive way.

It is important to note that AI technology, while advanced, is not yet able to fully understand and interpret the context and meaning of historical primary sources on its own. Humans with content knowledge must bring their understanding and expertise of the historical context, culture, and events of the era, which is necessary for an accurate interpretation of the primary sources. Social studies educators play a critical role in fostering critical analysis and interpretation of the information provided by AI enhancements, which is essential to ensure that the historical primary sources are presented accurately and in context.

ChatGPT's ability to generate text raises important questions related to the future of education, particularly within the field of social studies. While the potential for cheating and academic dishonesty is real, educators must also consider the benefits of using AI in the classroom, such as the ability to provide instant feedback and improve students' critical thinking skills. The challenge lies in finding the right balance, embracing the potential of technology while preserving the integrity of the education system. As we move forward, let us use ChatGPT and other AI tools as a catalyst for change, pushing us to re-imagine the possibilities of education in the digital age. ◢

Notes

1. DALL-E, another next-generation artificial intelligence tool, was developed by OpenAI and has the ability to generate original images based on a given text prompt. It can be accessed at **https://openai.com/dall-e-2**.

2. Vitomir Kovanovic, "The Dawn of AI has Come, and Its Implications for Education Couldn't be More Significant," *The Conversation* (Dec. 14, 2022).

3. A number of resources are emerging that provide guidance on writing better prompts for ChatGPT and inspire ideas for implementation in the classroom, such as *A Teacher's Prompt Guide to ChatGPT: Aligned with 'What Works Best'* (**bit.ly/WWBChatGPT**) and **https://github.com/f/awesome-chatgpt-prompts**.

4. See Caitlin Cassidy, "Australian Universities to Return to 'Pen and Paper' Exams after Students Caught Using AI to Write Essays," *The Guardian* (Jan. 9, 2023) and Michael Elsen-Rooney, "NYC Education Department Blocks ChatGPT on School Devices, Networks," Chalkbeat New York (Jan. 3, 2023).

5. See Emma Bowman, "A College Student Created an App that Can Tell Whether AI Wrote an Essay," NPR (Jan. 9, 2023); Ann-Marie Alcántara, "Is it Human or AI? New Tools Help You Spot the Bots," *Wall Street Journal* (Jan. 10, 2023); and "Academic Integrity in the Age of AI," Turnitin, **www.turnitin.com/resources/academic-integrity-in-the-age-of-AI**.

6. AI4K12.org, "Five Big Ideas in Artificial Intelligence" (2019). Poster available at **https://ai4k12.org/resources/big-ideas-poster**.

7. AI4K12.org, "Big Idea 5: Societal Impact" (2022). Grade band progression chart available at **https://ai4k12.org/big-idea-5-societal-impact**. Draft version dated December 22, 2022.

8. Access the Bill of Rights Institute lesson at **https://billofrightsinstitute.org/e-lessons/chat-gpt-and-how-we-learn** and *The New York Times* Lesson Plan on Teaching and Learning in the Era of ChatGPT at www.nytimes.com/2023/01/24/learning/lesson-plans/lesson-plan-teaching-and-learning-in-the-era-of-chatgpt.html.

9. Keith Patterson, "Using Artificial Intelligence to Improve Audio Quality of Primary Sources (and Other Things as Well)," TPS Teachers Network (Oct. 14, 2022), **https://tpsteachersnetwork.org/tps-tech-talk/using-artificial-intelligence-to-improve-audio-quality-of-primary-sources-and-other-things-as-well**

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