

Integrating Generative AI and digital tools to Augment Student Creativity and productivity: A Case Study

Dr. Leena Thacker Kumar, Dr. Christina Hughes, Dr. Clayton Cleveland

Generative AI is changing education. Responses to this change in technology in the classroom include banning AI use, ignoring it, or integrating it. Current discussions emphasize faculty concerns of GAI, including hallucinations and plagiarism. Student surveys conducted during the Fall 2024 semester illustrate that students have many of the same concerns as faculty. Thus, given the exponential pace of AI development and potential use, it is imperative that we expose our students to Generative AI. The goal is to make students aware of how they can use generative AI tools to augment their work and increase their critical thinking while guarding against risks and downsides. We will showcase an assignment from our courses where we incorporated a prompt produced by ChatGPT to create a critical thinking assignment. Our findings support the notion that AI can be harnessed in support of student learning

Introduction

The large language model (LLM) ChatGPT was released in November 2022 by OpenAI. Within months the program demonstrated its ability to pass college level exams in Business School, Law School and even the U.S. Medical licensure Exam (Castillo, 2023a). Harvard Graduate student, Maya Bodnick (2023), demonstrated that ChatGPT could pass Harvard Freshman level liberal arts courses with an overall GPA of 3.57. By March of 2023, two of the country's largest school districts, New York City Public Schools and Los Angeles Unified School District had banned ChatGPT from all district devices. Two international universities had banned the program, as well. In a survey of U.S. college students conducted by *Best Colleges*, 1/3 of respondents reported that AI had been banned from use in at least one of their classes (Castillo, 2023b).

While many administrators see Generative Artificial Intelligence (GAI) as beneficial, most faculty fear the impact it will have on student learning (McMurtrie, 2024, 2025) and are apprehensive about its use to cheat. In a survey of 586 faculty conducted in March 2023, 37% of respondents stated they were concerned about student's using LLMs to cheat, and 26% stated they were concerned about the impact on student's writing and research skills (Ardoin and Hicks, 2024). In two surveys conducted by APSA in 2023 of their membership, political science faculty reported that AI would have an overall negative impact on their classroom and most respondents reported plans on banning AI use rather than including AI skills in their curriculum (Wu and Wu 2024). These trends extend beyond the borders of the United States. An additional survey about AI shows that US faculty are more skeptical toward AI than faculty in 27 other countries (McMurtrie 2025). Most faculty do not believe that their institution provides enough resources to promote AI literacy (McMurtrie 2025).

There is reason for their concern. ChatGPT and other LLMs do make it easy for students to cheat. These programs are designed to produce essays based on a prompt allowing the user to present work as their own that they did not write. As Bodnick (2023) demonstrated, these papers are good enough to receive A's and B's at Harvard. Because it is difficult to distinguish between human and AI generated essays the threat to academic integrity is real (Cotton and Cotton, 2023; Dehouche 2021). Since the text GAI produces is original, there is no cache of work that can be used to compare and identify plagiarized papers. AI has also been known to hallucinate, a term for producing false information (Alkaissi 2023, Walters and Wilder 2023, Wagner and Wagner 2024, Weis and Metz 2023, O'Brian 2023). Walters and Wilder asked ChatGPT to compose 42 papers on various topics. They found 55% of the citations produced by ChatGPT to support the theses of these papers were fabricated.

There are several difficulties with a policy of banning GAI. For one detection by instructors or even programs that look for plagiarism, such as Turnitin, is difficult if not impossible (Ardoin and Hicks 2024). New open-source developments and access to AI technology is accelerating as evidenced by the release DeepSeek by a Chinese company (Browne 2025). And the use of AI no longer even requires the extra step of going to a separate program.

As of January 2025, Copilot has been integrated into all Microsoft 350 programs, Word, Excel, PowerPoint, etc. Open a blank Word document to write a paper, and Copilot asks if you want help. Reminiscent of the paperclip that used to pop up and ask if you needed help with grammar and spelling. Only this paper clip will compose the paper. Copilot is also integrated into Microsoft's search engine, Bing. If a user types a question into Google's search engine, the web application returns a list of websites where one can find the answer. However, if a user types a question into Bing, Copilot will answer the question for the user. The answer may or may not be correct.

Our work contributes to the literature on AI in education through examining the student perspective on AI. This yields an assessment missing from discussions about AI in education as the focus to date has been upon faculty perceptions rather than students' role. While many others have stressed that we need to have a better understanding of AI to integrate it into the classroom and to have nation-wide discussion about the impact of GAI on student learning, the missing component is the student's perception of GAI. To have this discussion, faculty also need to know what the students think about their needs and the role GAI will play at work and in the future.

Pilot Survey on Generative AI

During the fall 2024 semester, we asked students in an Introduction to Federal Government course at University of Houston Dnnton to participate in a pilot survey on AI use. Federal Government is a core course, and all students attending Texas public universities must complete the course, regardless of major. The course is offered in three modalities, face to face, asynchronous online, and hybrid. Hybrid courses at UHD are a combination of asynchronous online and once a week face to face meetings in the classroom. Students in all three modalities were offered a link to the survey in Qualtrics to take. Students were told participation was voluntary and responses would be kept anonymous. Table 1 shows response rate by modality.

Table 1

Modality	Responses
Online	35
Face to Face	14
Hybrid	4
Total	53

Other than gender and age we did not ask any demographic questions of the respondents. UHD is a minority and Hispanic serving institution located in downtown Houston. Fifty-seven percent of our students are Hispanic, 18% black, 8% Asian, and 11% White. Only 45% of our students are full time, and our students tend to be older than their counterparts of other public universities. The pilot survey questions were designed to receive a snapshot of student's experience and concerns with AI.

The survey question can be broken down into four categories: current familiarity and use of GAI; concerns; future importance; necessary skills and desire to learn more.

Current familiarity and use

We asked students about their current familiarity with GAI, which GAI tools they currently use, how they use it, and if they find it useful in their learning (Tables 2, 3, 4, & 5).

Table 2

How Familiar are you with the Concept of GAI?	
Extremely familiar	2
Very Familiar	12
Slightly Familiar	30
Not Familiar at all	8
Total	52

Table 3

Which AI tools have your used?	
Grammarly	26
ChatGPT	9
Microsoft Copilot	6
Other	5
ChatGPT, Grammarly	5
ChatGPT, Grammarly, other	1
Grammarly, Microsoft Copilot	1
Total	53

Table 4

For What Purpose do you use AI in your studies?	
Grammer and spell checking	28
Research and information gathering	10
Generating ideas	8
Summarizing documents	4
Other	2
Total	52

Table 5

How useful do you find AI tools in improving your learning experience?	
Extremely useful	3
Very useful	25
Slightly useful	23
Not useful at all	1
Total	52

The majority of respondents reported some level of familiarity with Generative AI. Only 8 respondents stated they are “not familiar at all.” We also asked students which AI tools they had used in their coursework and for what purpose. All but one student stated they had used at least one AI program in their coursework. The majority, 33, reported using Grammarly only or Grammarly and an additional GAI tool. Only 11 reported using Chat GPT and only 7 reported using Microsoft’s Copilot. This corresponds with how students reported using AI, with most students reporting using these tools for grammar and spell checking. Only 14 students reported using it to conduct research or summarizing documents. When students about the usefulness of GAI 98% reported it was useful, with 48 (92%) reporting slightly or very useful. Three students reported it was extremely useful.

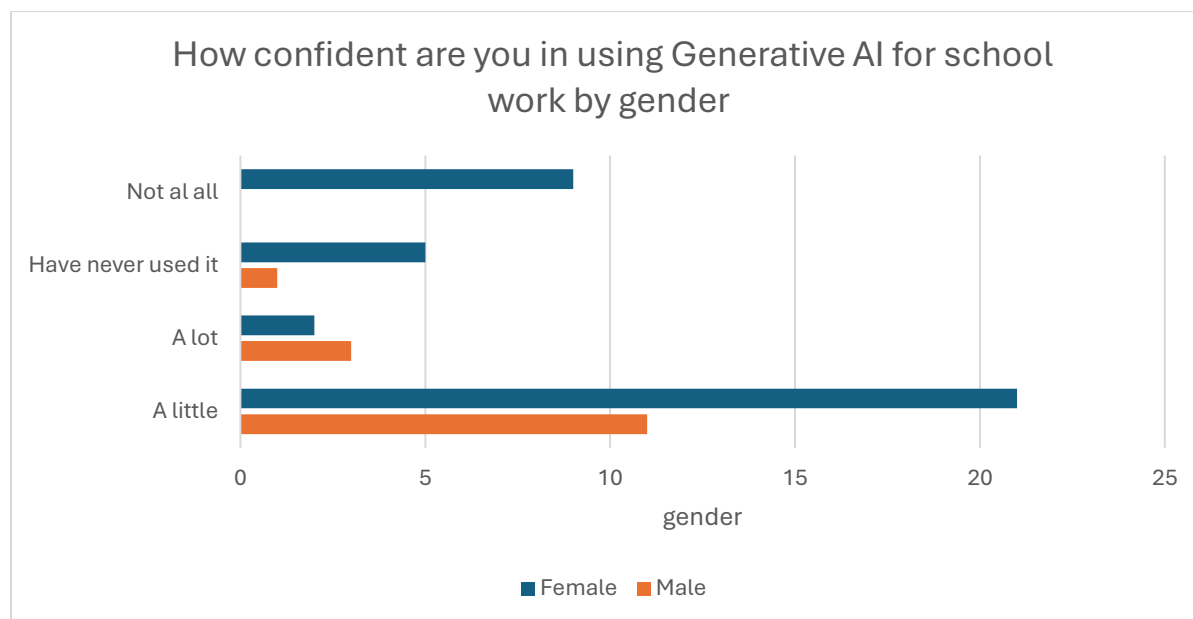
Students were also asked about their confidence level in using GAI. Despite their frequent use, only 1 student reported being very confident in its use. Thirty-two reported only have a little confidence in its use (Table 6). Cahill and McCabe had similar finding in their survey of 104 political science students at public universities (Cahill and McCabe, 2024).

Table 6

How confident are you in using Generative AI for schoolwork?	
A lot	1
A little	32
Not at all	9
Have never used it	6
Total	52

Cahill and McCabe asked students to assess their AI skill levels across several tasks including data analysis, quiz/exam preparation, and to improve writing. They found that male students had a higher assessment of their skills than female students (Cahill and McCabe, 2024). We also found differences between genders and confidence levels using GAI for schoolwork (Figure 1).

Figure 1



No male students reported no confidence and only one male student reported they had never used GAI. Our sample was 71% female, 9% above the UHD Fall 2023 enrollment of 62%. Female.

Concerns

Student's lack of confidence in using GAI may be a reflection of their concerns over its use. We found that many of the student's concerns mirror those of faculty (Ardoin and Hicks, 2024; Wu and Wu, 2024, McMurtrie, 2024). Accuracy of information and plagiarism received the most responses. Students also stated being concerned with privacy and data security (Table 7).

Table 7

What concerns do you have about using AI?	
Accuracy of Information	24
Plagiarism	18
Privacy and data security	10
Other	1
Total	53

We were curious if the concerns about using AI varied by age. Table 8 shows the percentage of distribution of age by given concern. Students below age of 20 were less likely to choose privacy and data security, student over 30 were more likely to choose this option. A higher percentage of students under the age of 30 chose accuracy of information.

Table 8

Concern	Age below 20 yrs	Age 20-30 yrs	31-50yrs
Accuracy of information	52%	47%	24%
Plagiarism	39%	29%	38%
Privacy and Data Security	9%	24%	38%
Total	100%	100%	100%

Future importance

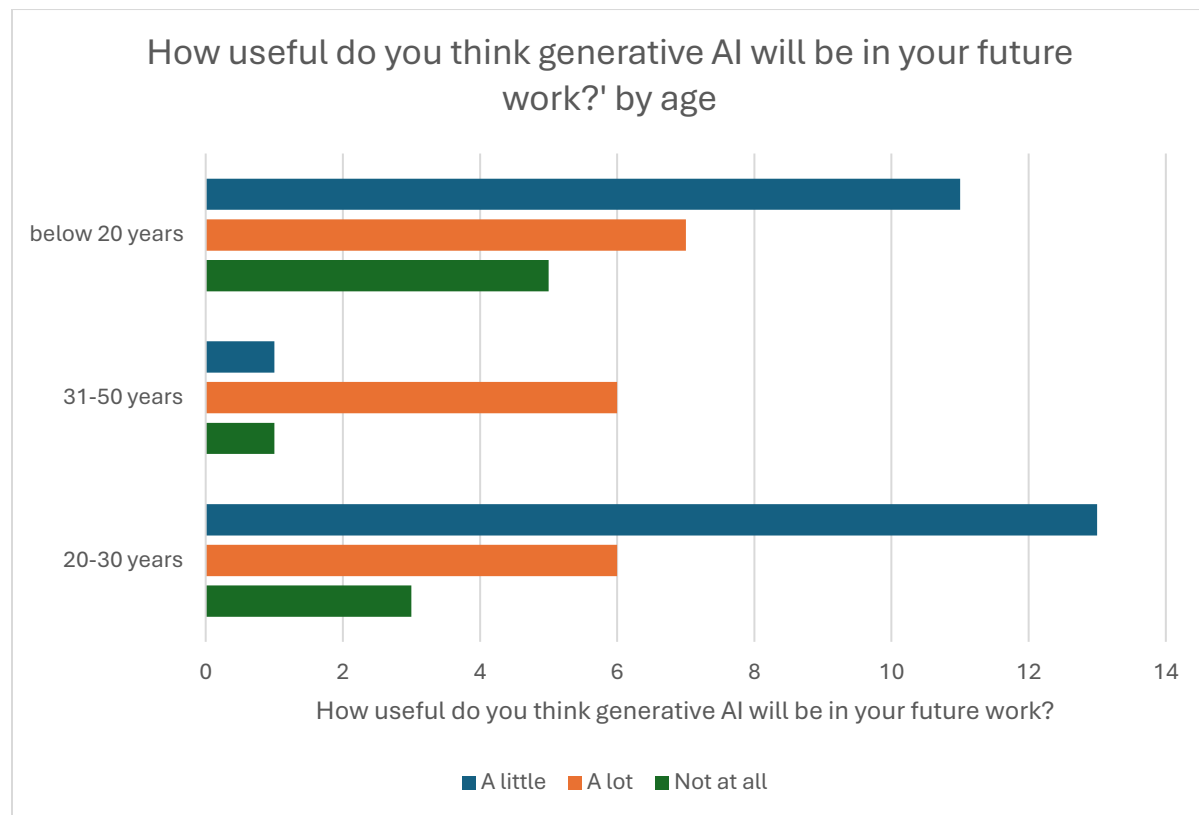
In as Slack Workforce Lab survey of 32,000 respondents, 96% of executives stated it was urgent to incorporate AI into their businesses, and 70% of leaders said they will not hire someone without AI skills (Smith.2024). Though our students recognize that AI will be useful at the future careers, they lack the ‘urgency’ of the executive in the Slack Workforce Lab survey (Table 9).

Table 9

How useful do you think GAI will be in your future work?	
A lot	19
A little	25
Not at all	9
Total	53

Only 19 students answered, “a lot”, the majority answered, “a little”. Nine students (17%) did not think it would be useful at all. We were curious if this distribution would still hold when controlling for age of student (Figure 2).

Figure 2



The age group with the highest percentage of no usefulness in their future work were the 20–30-year-olds. Students over the age of 30 had the highest percentage of belief in usefulness in future work.

Necessary skills and desire to learn more

We also asked students a series of questions about the necessary skill they needed to use GAI and if they were interested in seeing integration of GAI into their coursework. We first asked students to choose from a dropdown list the skills they thought were useful in using AI and then asked students how important critical thinking skills were for understanding AI output (Tables 10 and 11). Most students chose asking good questions and critical thinking for useful skills and an overwhelming majority said critical thinking skills was very important or important. Only one student stated critical thinking skills was not at all important.

Table 10

What skills do you think are useful in using AI?	
Asking good questions/prompt	22
Critical thinking	16
Ability to identify false information	11
Coding	3
Total	52

Table 11

How important are critical thinking skills for understanding what to do with AI output	
Very important	25
Important	22
Somewhat	5
Not at all	1
Total	53

We also asked student about interest in learning about GAI and if they would like to see it integrated into their coursework (Tables 12 and 13).

Table 12

How much interest do you have in learning about ChatGPT or other AI tools?	
Already know a lot	1
A lot	17
A little	28
Not at all	7
Total	53

Table 13

Would you like to see more integration of AI in your course work at UHD	
Yes	21
No	7
Not Sure	25
Total	53

The majority of students reported at least some interest in learning about GAI. Only 7 students stated having no interest and one stated they already knew a lot. The desire to see GAI integrated into their coursework was surprising. We thought students would be excited about being granted

permission to use GAI in their course work, however, less than half said yes. The majority stated not sure or no.

Using AI to augment critical thinking

Given the lack of confidence students have in their AI skills, we designed an assignment incorporating Chat GPT. The assignment had 2 goals: demonstrate to the students the limits of generative AI and have them use the AI generated response to hone their critical thinking skills. Three modalities, face to face, online, and hybrid, of Federal Government were given the assignment. The assignment was composed of three separate parts. First students were asked to participate in an online discussion with their classmates. In the face-to-face course, students did participation in class. They were asked to answer the following question: What are the necessary elements/requirements of an ideal democracy? To receive full credit, they also had to reply to a post left by at least one other student. The idea was to have the students think about the question before viewing the AI response.

Next, we asked ChatGPT to compose an essay using the assigned discussion question as a prompt. ChatGPT response to prompt can be found in appendix.

For part 2 of the assignment students asked to read the ChatGPT response and answer the following questions:

- 1) What grade would you give the response to the question, "What are the necessary requirements for democracy?"
- 2) Was there anything missing from the response?
- 3) What would you want explained further?

Most students gave the ChatGPT response a grade of an A or B. The most given response to "what's missing" was separation of power/check and balances. This response was most likely influenced by American students equating American democracy with the "ideal model". Almost as many students however, responded nothing. Several students responded, "peaceful transfer of power". That response, though generally included in any political scientist response to the question, may be due to the circumstances of January 6th, 2020. When asked what they wanted explained further, most students chose "accountability and transparency", though almost as many stated "everything". One student wanted examples for each component, and one asked what happens when a component is missing? Even the students who gave the essay a perfect score, found components they wanted explained further.

The third and final part of the assignment was designed specifically to focus on critical thinking skills. Students were asked to read the ChatGPT essay a second time and do the following:

- 1) List the components of a Democracy based on the answer generated by AI (Answer attached) and rate these elements in the context of American democracy today. Your rating should be between 1-5, where 1 indicates that American democracy does not meet this requirement, while 5 indicates that it fully meets the requirement.

- 2) Choose any element you gave a rating of 1 (does not meet the requirement) and explain in 300 words why you assigned the rating that you did. Give an example to illustrate your point. USE YOUR OWN WORDS TO WRITE THE ANSWER.

Most students selected “free and fair elections “accountability and transparency” and “the rule of law” as lacking in U.S. democracy. It is apparent from the written responses that student’s answers were influenced by current events. Below are excerpts from student responses:

“...while there is some degree of legal structure and enforcement, the rule of law is weak and is inconsistent. In our opinion, the legal rights and protections may exist on paper but are not fully respected or implemented in practice. Look at our politicians today who have broken the laws and are still elected or have faced no punishment or ramifications for their actions... Legal processes are inefficient, slow or lacking transparency; judicial independence has been compromised; and laws have been applied selectively, with certain individuals or groups such as politicians or individuals that are very wealthy receiving preferential treatment or facing discrimination.” (Student ranked rule of law a 2 out of 5)

“...voter suppression and gerrymandering remain ongoing issues that undermine transparency. In 2024, states like Georgia and Texas have seen controversial laws passed that impose restrictions on voting access, particularly affecting marginalized communities. These restrictions, such as strict voter ID requirements and limited early voting, disproportionately affect Black, Latino, and low-income voters. Such laws raise questions about whether the election process is genuinely transparent and accessible to all eligible voters...” (Student ranked free and fair elections 2 out of 5)

“...In terms of accountability and transparency, I rated the book two stars because while the United States has mechanisms intended to ensure transparency, actual implementation shows significant gaps. Transparency laws, such as the Freedom of Information Act (FOIA), are meant to foster accountability by giving the public access to government actions. Despite this, accessing information can be problematic, as agencies often delay responses or redact documents heavily...The influence of lobbying and corporate donations on government decisions has also raised concerns about who truly holds power. It is these issues that affect citizens' trust in government transparency and elected officials' accountability” (Student ranked accountability and transparency a 2 out of 5)

Limitations of current project

We began this project during mid semester. Due to time constraints, only the fully online section was able to complete a post survey of students after they completed the assignments. Therefore, we only have a measure of student attitudes toward AI before the assignment was completed. We hope being able to give both pre and post surveys this semester will allow us to demonstrate a boost in confidence in using AI among our students after completion of the assignment.

We discovered using generative AI to answer political science questions in an election year can be challenging. The prompt was first fed to Microsoft Copilot. Copilot stated that it

could not answer questions about the election. An interesting response since the prompt mentioned neither the United States nor the election. We simply asked: What are the necessary requirements of an ideal democracy? Chat GPT did give the response that was used for the assignment. However, since Copilot has been integrated into all Office 365 programs, including Word, that will most likely become the default LLM for our students.

Works cited

- Alkaissi, Hussam and Samy I. McFarlane 2023. "Artificial Hallucinations in ChatGPT: Implications in Scientific Writing." *Cureus* 15(2). Available from <https://www.cureus.com/articles/138667-artificial-hallucinations-in-chatgpt-implications-in-scientific-writing#!/>
- Ardoin, Phillip J., and William D. Hicks 2024. "Fear and Loathing: ChatGPT in the Political Science Classroom." *PS: Political Science & Politics*, 57 (4): 583-593. DOI: 10.1017/S1049096524000131.
- Bodnick, Maya 2023. "ChatGPT goes to Harvard" *Slow Boring*, July 18. Available from <https://www.slowboring.com/p/chatgpt-goes-to-harvard>
- Browne, Ryan 2025. "Deepseek's Breakthrough Emboldens Open-Source AI Models Like Meta's Llama." *CNBC*, February 4. Available from <https://www.cnbc.com/2025/02/04/deepseek-breakthrough-emboldens-open-source-ai-models-like-meta-llama.html>. Accessed: 2/5/2025.
- Cahill, Christine, and Katherine McCabe 2024. "Context Matters: Understanding Student Usage, Skills, and Attitudes toward AI to Inform Classroom Policies." *PS: Political Science & Politics*, 57 (4): 594-601. DOI: 10.1017/S1049096524000155.
- Castillo, Evan 2023a. "What Exams has ChatGPT Passed?" *Best Colleges*, March 23. Available from <https://www.bestcolleges.com/news/what-exams-has-chatgpt-passed/>
- Castillo, Evan 2023b. "These Schools and Colleges have Banned Chat GPT and Similar AI Tools" *Best Colleges*, March 27. Available from <https://www.bestcolleges.com/news/schools-colleges-banned-chat-gpt-similar-ai-tools/>
- Cotton, Debbie, et al 2024. "Chatting and cheating: Ensuring academic integrity in the era of ChatGPT." *Innovations in Education and Teaching International*, 61(2): 228-239. Available from <https://www.tandfonline.com/doi/full/10.1080/14703297.2023.2190148>
- Dehouche, Nassim 2021. "Plagiarism in the age of massive generative pre-trained transformers (GPT-3)." *Ethics in Science and Environmental Politics*, 2, 17-23. Available from <https://doi.org/10.3554/esepoo195>
- McMurtrie, Beth 2024. "Professors Ask: Are We Just Grading Robots?" *The Chronicle of Higher Education*, July 5. 70 (22). Accessed: 1/16/2025
- McMurtire, Beth 2025. "Teaching: Is Higher Ed Prepared for AI's Impact? It Doesn't Seem So." *The Chronicles of Higher Education Teaching Newsletter*, January 30. Available from <https://www.chronicle.com/newsletter/teaching/2025-01-30>.
- O'Brien, Matt 2023 (August 1st). "Chatbots sometimes make things up. Is AI's hallucination problem fixable?" *AP News*. Available from <https://apnews.com/article/artificial-intelligence-hallucination-chatbots-chatgpt-falsehoods-ac4672c5b06e6f91050aa46ee731bcf4>

Smith, Morgan 2024. AI skills can help you land a job or promotion. faster—especially for Gen Z, CNBC Make it, June 18.

The National. “Bogus Essays and fear cheaters have discovered the internet” CBC. 1996.

Wagner, Mathias W. and Brigit B. Ertl-Wagner 2023. “Accuracy of information and references using ChaptGPT-3 for retrieval of clinical radiological information” *Canadian Association of Radiologist Journal*. Available from <https://journals.sagepub.com/doi/10.1177/08465371231171125>.

Walters, William H. and Esther Isabelle Wilder 2023. “Fabrication and error in the bibliographic citations generated by ChatGPT” *Scientific Reports*, September. Available from <https://www.nature.com/articles/s41598-023-41032-5#:~:text=Although%20chatbots%20such%20as%20ChatGPT%20can%20facilitate>

Weise, Karen and Cade Metz 2023. “When A.I. chatbots hallucinate. *The New York Times*.

Wu, Nicole, and Patrick Y. Wu 2024. "Surveying the Impact of Generative Artificial Intelligence on Political Science Education." *PS: Political Science & Politics*, 57 (4): 602-609. DOI: 10.1017/S1049096524000167.

Appendix

ChatGPT Response to prompt: What are the necessary requirements of an ideal democracy?

The Necessary Components of Democracy

Democracy, often heralded as the ideal form of governance, is characterized by the participation of citizens in the decision-making process. While the specific manifestations of democracy can vary from one country to another, certain core components are universally necessary for a democracy to function effectively. These components include free and fair elections, political pluralism, the rule of law, civil liberties, accountability and transparency, and an active citizenry. Together, they create a framework that supports democratic governance and ensures that the voices of the people are heard and respected.

Free and Fair Elections

At the heart of any democracy lies the principle of free and fair elections. This means that citizens have the right to vote for their representatives without coercion or manipulation. Elections must be conducted transparently, allowing for the impartial monitoring of the electoral process. The integrity of elections is essential, as it establishes the legitimacy of the government and reflects the will of the people. When elections are compromised by fraud or intimidation, the foundation of democracy weakens, leading to disillusionment among the electorate.

Political Pluralism

Political pluralism refers to the existence of multiple political parties and diverse political viewpoints within a democratic system. A healthy democracy encourages competition among parties, allowing voters to choose from a range of options that best represent their interests and values. This plurality not only enhances democratic engagement but also prevents the concentration of power in the hands of a single party, which can lead to authoritarianism. By fostering a vibrant political landscape, pluralism ensures that various voices, including those of marginalized groups, have the opportunity to participate in the political process.

The Rule of Law

The rule of law is a cornerstone of democracy, emphasizing that laws apply equally to all individuals, including government officials. This principle safeguards citizens against arbitrary actions and abuses of power. An independent judiciary plays a crucial role in upholding the rule of law by interpreting and enforcing laws impartially. When citizens have faith in a just legal system, they are more likely to engage in the democratic process and hold their leaders accountable. Conversely, a lack of adherence to the rule of law can erode public trust and lead to social unrest.

Civil Liberties

Civil liberties, such as freedom of speech, assembly, and the press, are fundamental rights that protect individual expression and dissent. In a democracy, citizens must be free to voice their opinions and advocate for change without fear of retribution. These freedoms are essential for fostering public debate and ensuring that diverse perspectives are considered in policy-making. When civil liberties are curtailed, the democratic process is stifled, and citizens may become apathetic or disengaged from politics.

Accountability and Transparency

For a democracy to thrive, government officials must be held accountable for their actions, and the decision-making process must be transparent. Mechanisms such as regular audits, public access to information, and independent oversight bodies help ensure that officials act in the public interest. Transparency fosters trust between the government and its citizens, encouraging active participation in governance. When citizens believe that their leaders are acting in good faith and are accountable for their actions, they are more likely to engage with the political system.

Active Citizenship

Finally, an active and informed citizenry is essential for a functioning democracy. Citizens must not only have the right to vote but also the knowledge and willingness to engage in civic activities, such as attending town hall meetings, participating in advocacy, and holding elected officials accountable. Education plays a vital role in fostering an engaged citizenry, as it equips individuals with the tools to understand complex political issues and make informed choices. A vibrant democracy relies on citizens who are aware of their rights and responsibilities and who actively participate in the democratic process.

Conclusion

In conclusion, the necessary components of democracy—free and fair elections, political pluralism, the rule of law, civil liberties, accountability and transparency, and active citizenship—are interdependent and essential for creating a robust democratic society. Each component reinforces the others, contributing to a political environment where the voices of the people can be heard, respected, and acted upon. As societies continue to evolve, it is crucial to safeguard these components to ensure that democracy remains vibrant and effective in meeting the needs of its citizens.