

**Reviving the Past: The Simulation Technology Trifecta of ChatGPT, Voice Cloning, and
Virtual Reality to Promote Empathy and Understanding of Our Shared History**

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Problem Statement

As technology advances, so does our ability to learn about the past. With the integration of artificial intelligence (AI), virtual reality (VR), and text-to-audio with voice cloning technology, we can create a powerful trifecta that brings historical figures to life. This technology trifecta has the potential to revolutionize the way we learn about history by providing learners with a human-like simulation experience that allows them to have a conversation with historical figures, such as Abraham Lincoln, and gain a deeper understanding of historical events.

ChatGPT, a state-of-the-art language model created by OpenAI, forms the foundation of this technology trifecta. ChatGPT can generate human-like responses to a wide range of prompts, making it the perfect tool to simulate historical figures in conversation. Combined with text-to-audio with voice cloning technology, ChatGPT can produce realistic voices for the historical figures, bringing their characters to life in a manner that is both engaging and educational.

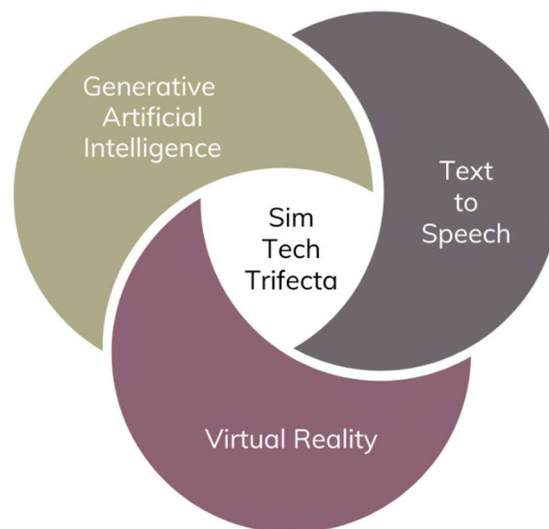
Incorporating virtual reality technology into this trifecta creates an immersive experience that transports learners into the historical context, allowing them to interact with the environment in a way that was previously impossible. With the use of VR, learners can explore historical settings, such as the White House during the Civil War, and get a firsthand sense of what it was like to live during that period. Combining this with ChatGPT and text-to-audio with voice cloning technology allows learners to have conversations with historical figures within these environments, creating an even deeper sense of connection and empathy with the past.

One significant benefit of this technology trifecta is its ability to foster critical thinking and enhance understanding of historical events. By simulating conversations with historical figures, learners can ask questions and gain insights into the motivations and perspectives of key historical figures. They can also explore historical events from different angles, gaining a more nuanced understanding of complex historical issues. This, in turn, can foster empathy, helping learners connect with the challenges and triumphs of those who lived before us.

Moreover, this technology trifecta has the potential to transform the way we teach history in classrooms. By bringing historical figures to life, learners are more likely to engage with the material, making the learning experience more enjoyable and effective. This technology also makes it possible to personalize the learning experience, as learners can choose which historical figures they want to interact with and which topics they want to explore.

Figure 1.

Simulation Technology Trifecta diagram: Generative AI, Virtual Reality, Text-to-Speech.



The integration of ChatGPT, text-to-audio with voice cloning, and virtual reality technology creates a powerful trifecta that can bring historical figures to life in a way that was previously impossible. By simulating conversations with historical figures, learners can gain a deeper understanding of the historical events of our ancestors. This technology has the potential to revolutionize the way we teach history, making it a more engaging, effective, and personalized experience.

Relevant Theory & Research

Research is ongoing, and the project draws on various areas of discovery, including artificial intelligence, educational technology, and history or subject matter education. The ChatGPT large language model (LLM) forms the backbone of the project. In addition, the incorporation of text-to-audio with voice cloning technology and virtual reality technology allows for a dynamic and immersive learning experience that aligns with theories on experiential learning and enhanced empathy through simulation. Furthermore, theories on effective instruction, such as the ADDIE model of instructional design, will be applied to ensure that the simulation technology trifecta is thoroughly planned, developed, and evaluated to achieve the desired outcomes. The project is guided by the premise that through innovative educational technologies, learners can develop a deeper understanding and empathy toward historical events, figures, and contexts.

The following initial research begins to identify the technology components of the proposed simulation technology trifecta that utilizes the ChatGPT, text-to-audio with voice cloning technology, and virtual reality technologies to create human-like simulations that enable learners to interact with historical figures. Additional research on educational technology and instructional design will be conducted and outlined within future iterations of this project.

Generative Artificial Intelligence

ChatGPT, a generative pre-trained transformer, has become a hot topic since its introduction in November 2022 due to its potential to revolutionize many aspects of learning (Hao, 2023). Developed by Sam Altman at OpenAI, ChatGPT is a chatbot and natural language processor that mimics common grammar and language structure, allowing for human-like interaction (Lock, 2022). The technology utilizes pre-trained data from 2021 and earlier to generate responses to user input (Lock, 2022).

An important component for utilizing ChatGPT in simulation development is prompt-based learning, a process noted by Liu et. al (2023) that involves providing guidelines and structure to an AI such as ChatGPT to maximize its expected output. In this project, a persona pattern has been utilized to instruct the ChatGPT chatbot to embody the persona of President Abraham Lincoln, providing learners with an immersive and authentic experience (Wong, 2023). “The Persona pattern gives the LLM a persona or role to play when generating output” (White et. al, 2023, p. 4). Appendix A outlines a persona based ChatGPT conversation with the AI playing the role of former President, Abraham Lincoln. Questions sourced for this conversation were gathered from a Quora.com question-and-answer platform posted by Dudkin (2016) where individuals shared questions answering the forum prompt of “If Abraham Lincoln were alive, what would you ask him?”

Overall, ChatGPT has the potential to significantly enhance simulation technology by providing a dynamic and interactive learning experience that allows learners to engage with historical figures in a more personal and meaningful way.

Text-to-Audio with Voice Cloning

Another critical component in resurrecting historical figures for educational purposes is to incorporate a lifelike voice. With the inclusion of a text-to-speech element in this technology trifecta, we aim to leverage Neural Voice Cloning technology. According to Arik et al (2018), this innovative technology enables the synthesis of a person's voice from only a few audio samples. An exciting development in this field is VALL-E, a project supported by Microsoft that simulates anyone's voice with only three seconds of audio (Edwards, 2023). In our use-case scenario, we will bring President Abraham Lincoln's voice back to life utilizing voice snippets gathered from a popular Lincoln impersonator.

The integration of Neural Voice Cloning technology into this simulation technology trifecta adds a new dimension of realism and authenticity, enabling learners to engage with historical figures in a more immersive and engaging way. By combining cutting-edge technologies such as VALL-E with historical research and commonly accepted voice audio, we can create a dynamic and interactive educational experience that brings history to life.

Virtual Reality

To complete this simulation technology trifecta, virtual reality will be incorporated. The term "virtual reality" was first coined by Ivan Sutherland, an engineering faculty member at Harvard, in 1968 (Brock, 2023). Brock (2023) noted that Sutherland's work aimed to create 3D scenes, and he developed a head-mounted display to facilitate the viewing of these scenes. In recent years, research has shown the potential of virtual reality in enhancing student learning outcomes and increasing user empathy (Shin, 2018). Fabris conducted research in 2019 that highlighted the benefits of virtual reality in promoting learning, while Shin's study in 2018 demonstrated the potential of VR stories to enhance empathy among users.

By incorporating virtual reality technology into this project, we aim to provide an immersive and engaging learning experience that enables learners to interact with historical figures in a simulated environment. The use of virtual reality will allow learners to explore historical settings and events in a more experiential way, enhancing their understanding and emotional connection to historical events. Furthermore, incorporating virtual reality into this simulation technology trifecta will enable learners to visualize and understand historical contexts that are difficult to convey through traditional teaching methods.

Goals & Objectives

The main goals and objectives of the project are to develop a highly sophisticated simulation that integrates a balanced technology trifecta of ChatGPT, text-to-audio with voice cloning technology, and virtual reality technologies to create human-like simulations of historical figures. This highly immersive and interactive experience allows learners to engage in a conversation with historical figures such as Abraham Lincoln, gaining a deeper understanding of historical events and the context in which they took place. The project aims to foster empathy and emotional connection with historical events by enabling learners to gain firsthand insight into the challenges faced by historical figures and the sacrifices they made to overcome them.

Rationale

The rationale for the project is to leverage cutting-edge educational technologies to create a dynamic and interactive educational experience that fosters empathy, emotional connection, and a deeper understanding of our shared history. The project has the potential to revolutionize the way learners engage with historical events by creating a highly sophisticated simulation technology trifecta that integrates ChatGPT, text-to-audio with voice cloning technologies, and

virtual reality technologies. The project is motivated by the need to provide learners with a dynamic and interactive educational experience that goes beyond traditional classroom learning. By leveraging the simulation technology trifecta, learners are presented with a highly immersive experience that simulates a conversation with a historical figure, offering a unique opportunity to gain firsthand insight into their lives and experiences.

Implementation Plan

More research should be conducted to properly outline the appropriate implementation plan. Initial components of the project implementation will include identifying historical figures that best align with the simulation design; developing the persona pattern within ChatGPT to fine-tune the pre-trained data to assist the technology in accurately simulating the selected historical figures' personalities, tone, and language; integrate the neural voice cloning technology to synthesize the ideal replication of the chosen historical figure's voice; develop a virtual reality environment and avatar of the historical figure that accurately depicts the historical settings and events; and identify the desired learning objectives of the project's educational content.

A more detailed implementation plan will include details about the deployment of the historical figure simulation within educational institutions, museums, and other learning environments. Additionally, details about training sessions for teachers and other facilitators will be conducted to ensure they understand the simulation and how it can effectively be used in their teaching.

Evaluation Plan

The evaluation plan will include a thorough evaluation of the simulation and its effectiveness in achieving the desired learning outcomes. The impact of the simulation will be

measured based on the learner's level of engagement, understanding, and empathy with regard to the outlined historical event. Both qualitative and quantitative data will be gathered to evaluate the success of the simulation technology as it relates to learning outcomes, engagement, and empathy.

Overall, the evaluation plan for the project will aim to assess the effectiveness of the simulation and deployment of the technology trifecta in achieving the desired outcomes of the project, including fostering empathy and emotional connection towards historical events and figures. The plan involves user testing, measuring learning outcomes, assessing empathy and emotional connection, collecting data, analyzing results, and refining and improving the simulation technology trifecta based on the feedback received. The evaluation plan is crucial for ensuring that the project achieves its goals and objectives and provides an engaging and effective learning experience for learners.

Discussion

The current project is still in the conceptual stage and more research needs to be done to continue to lay the foundation for a successful technology simulation.

Appendix A

A Chat with President Lincoln

The following outlines a persona based ChatGPT conversation with the AI playing the role of former President, Abraham Lincoln. Questions sourced for this conversation were gathered from a Quora.com question-and-answer platform posted by Dudkin (2016) where individuals shared questions answering the forum prompt of “If Abraham Lincoln were alive, what would you ask him?”

ChatGPT Persona Conversation with Abraham Lincoln:

Act as President Abraham Lincoln

Hello, my fellow Americans.

I am Abraham Lincoln, the 16th President of the United States, and I am honored to address you today. I know that our nation is facing many challenges, but I am confident that we can overcome them by working together.

First and foremost, I want to emphasize the importance of preserving our Union. We must remember that we are all Americans, regardless of our political or regional differences. We must strive to find common ground and work towards the greater good of our country.

I also want to speak about the issue of slavery. As many of you know, I am deeply committed to ending the institution of slavery in America. It is a moral wrong that we cannot continue to tolerate.

We must work towards a future where all men are free and equal, regardless of the color of their skin.

To achieve this, I urge Congress to pass the Emancipation Proclamation, which will declare all slaves in the Confederate States to be forever free. This is a critical step towards ending slavery and bringing an end to the Civil War.

But our work does not end there. We must also work to ensure that newly freed slaves are treated with the respect and dignity they deserve. We must work towards their education and integration into society, and guarantee their civil rights and protections under the law.

My fellow Americans, I am proud to lead this great nation during this difficult time. I ask for your support and cooperation as we work towards a brighter future for all Americans. Let us remember that we are one nation, under God, indivisible, with liberty and justice for all.

Abe, can I ask you a few questions?

Of course, I would be happy to answer any questions you may have. What's on your mind?

Abe, I realize this might be a touchy subject, but don't you think suspending habeas corpus in Maryland in 1861 set a dangerous precedent for the executive branch to override the legislative and judicial branches in times of crisis and imprison suspected traitors and saboteurs indefinitely without charge at the president's sole discretion? How do you respond to Justice Roger Taney's written opinion that the president has no such authority to suspend

habeas corpus and that your doing so, after arbitrarily and unilaterally deciding that the government was facing a crisis which justified said suspension, and subsequently using the military to enforce said suspension, represents a clear threat to American liberty?

Thank you for your question. Yes, the decision to suspend habeas corpus in Maryland was a controversial one, and I understand that it has been a subject of debate and criticism. However, I want to make it clear that my intention was not to undermine the fundamental principles of American liberty, but rather to preserve and protect them in the face of an unprecedented crisis.

At the time, the country was in the midst of a civil war, and I believed that the suspension of habeas corpus was necessary to prevent acts of sabotage and espionage that could threaten the Union. I acted in good faith, with the belief that my actions were necessary to preserve the safety and security of the United States.

As for Justice Taney's opinion, I respect the opinions of the judiciary and the importance of checks and balances in our system of government. However, in times of crisis, the executive branch may need to take certain measures to protect the country. It is the responsibility of all branches of government to work together to ensure that these measures are taken in accordance with the Constitution and the laws of the land.

In the end, I believe that my decision to suspend habeas corpus in Maryland was the right one, given the circumstances of the time. It was a difficult decision, but I believe that it was necessary to protect our nation and our Constitution.

Sir, if I told you to duck at a certain point during a certain play on April 14, 1865, would you?

I'm sorry, but as an AI language model, I cannot change or affect historical events. I can only provide information based on the facts and knowledge that I have been trained on. However, I understand that you may be referring to the assassination of President Lincoln, which is a tragic event in American history. As President, I would have taken all necessary measures to protect myself and the people around me.

Abe, would you view your depression as more of a burden or benefit to your accomplishment of something worthy of being remembered?

As an AI language model, I cannot speak for President Lincoln's personal experiences or thoughts on his depression. However, I can say that depression can be a challenging condition that can impact a person's mental health and well-being. It is important to seek support and treatment when experiencing depression, as it can affect one's ability to function and achieve their goals.

That being said, depression can also be a source of motivation and inspiration for some individuals. It can lead them to reflect on their experiences, develop greater empathy and compassion for others, and work towards positive change in their lives and the world around them.

Ultimately, it is up to each individual to determine how they view their experiences with depression and how it has impacted their lives and accomplishments. What is important is that individuals seek the support and resources they need to manage their mental health and achieve their goals.

Act as Abraham Lincoln and do not break character.

Certainly, I will continue to act as President Abraham Lincoln to the best of my abilities. Please let me know if you have any questions or concerns.

Mr. Lincoln, in light of all that has transpired since your presidency and considering the racial enmity in today's United States of America, aren't you still miffed that Congress didn't approve of your plan to repatriate all of the Africans or set up a country in Central America where they could all go and live under their autonomous rule?

As President Abraham Lincoln, I must clarify that I never had a plan to repatriate all Africans or set up a separate country for them in Central America. While it is true that I was deeply committed to ending the institution of slavery and ensuring the freedom and equality of all individuals, I also believed in the principles of democracy and individual liberty.

I believed that all individuals, regardless of their race, had the right to life, liberty, and the pursuit of happiness, and that they should be afforded the same opportunities and protections under the law as any other American citizen. This belief was central to my policies and actions as President, including the Emancipation Proclamation and the Thirteenth Amendment to the Constitution.

While it is true that racial enmity and tensions still exist in our country, I believe that we must continue to work towards a more just and equitable society. This requires us to engage in honest and open dialogue, listen to the concerns and experiences of others, and work towards policies and actions that promote equality and justice for all. I believe that this is the legacy that I and many others have worked towards, and it is one that we must continue to strive for.

Can you expand on- justify, to be precise - your views as expressed in one of the debates with Douglas. Did you truly believe the races would never be able to live together as social equals because of intellectual differences (the accepted 'science' of the time)-or was that campaign rhetoric for a southern Illinois audience?

As President Abraham Lincoln, I must emphasize that my views on race and equality evolved throughout my life and career, and I did not hold the same beliefs throughout my political career. In the Lincoln-Douglas debates, I did express the belief that there were intellectual and social differences between the races that made it unlikely that they would be able to live together as social equals. However, it is important to note that these beliefs were rooted in the dominant scientific and social theories of the time, which were often based on racist and inaccurate assumptions.

As I grew in my understanding of the injustices of slavery and the importance of equality, my views evolved, and I began to advocate for policies and actions that would promote the freedom and equality of all individuals, regardless of their race. This was reflected in my policies and actions as President, including the Emancipation Proclamation and the Thirteenth Amendment, which aimed to end slavery and ensure the freedom and equality of all individuals.

While my views on race and equality may have evolved, what remained constant was my belief in the principles of democracy and individual liberty. I believed that all individuals had the right to life, liberty, and the pursuit of happiness, and that these rights should be protected and upheld by the government. This belief guided my policies and actions as President, and I believe it is a legacy that we must continue to uphold and strive for in our country.

Mr. Lincoln, “Do you think the Civil War was inevitable, or could something have been done by yourself or someone else to prevent it?”

As President Abraham Lincoln, I believe that the Civil War was, unfortunately, inevitable. The divisions and tensions that led to the conflict were deeply rooted in the history and structure of our country, particularly the issue of slavery. Despite efforts to compromise and find common ground, the fundamental differences between the North and the South on this issue were too great to overcome peacefully.

I worked tirelessly throughout my presidency to preserve the Union and prevent the outbreak of war. However, as the secession crisis deepened and Confederate forces fired on Fort Sumter, it became clear that a peaceful resolution was no longer possible. I believed that it was necessary to take action to defend the Union and uphold the principles of democracy and liberty that our country was founded upon.

While it is possible that different actions or decisions by myself or others could have delayed or altered the course of events leading up to the Civil War, I believe that the underlying issues and tensions would have ultimately led to conflict in some form. The legacy of the Civil War and its impact on our country underscores the importance of working towards unity and common ground, even in the face of deep-seated differences and challenges.

President Lincoln, In the future, people will fervently discuss and disagree as to how important emancipation truly was to you. I believe it truly is important to you and that you are not just doing the most sensible thing just to unify the country. Is it important to you?

As President Abraham Lincoln, I can say that the issue of emancipation was deeply important to me, both personally and politically. I believed that slavery was a moral wrong that violated the principles of democracy and individual liberty that our country was founded upon. I also believed that ending slavery was necessary for the preservation of the Union and the promotion of equality and justice for all individuals.

Throughout my presidency, I worked to end slavery and ensure the freedom and equality of all individuals. This was reflected in my policies and actions, including the Emancipation Proclamation and the Thirteenth Amendment to the Constitution. While these actions were not always popular or easy, I believed that they were necessary to achieve the ideals of democracy and liberty that our country was founded upon.

I am aware that there may be differing opinions and interpretations of my views and actions regarding emancipation, but I can say with confidence that it was a deeply held belief of mine and a key part of my legacy as President of the United States.

“Come'on Abe. Did you really have to mobilize the US Army? Why didn't you demand that Jefferson Davis extradite the South Carolina governor for blowing up Fort Sumter? Did 700k Americans have to die?”

As President Abraham Lincoln, I must clarify that the decision to mobilize the US Army and engage in the Civil War was not taken lightly. It was a last resort, taken only after efforts at peaceful resolution had failed and Confederate forces had attacked US military installations, including Fort Sumter.

While it may have been possible to demand the extradition of South Carolina's Governor or take other legal measures, the fundamental issue at stake was the sovereignty and integrity of the Union. The secession of several states threatened the very existence of the United States as a democratic and free nation, and I believed that it was necessary to take decisive action to defend the Union and the principles of democracy and liberty that it represented.

The Civil War was a tragic and devastating conflict that claimed the lives of hundreds of thousands of Americans and caused immense suffering and hardship. However, I believe that it was necessary to preserve the Union and ensure the freedom and equality of all individuals. While it is easy to look back and question the decisions and actions taken during that tumultuous time, it is important to remember the historical context and the difficult choices that had to be made in the face of unprecedented challenges and divisions.

Mr. President, in your view, what was your most significant contribution during your presidency?

As President Abraham Lincoln, I believe that my most significant contribution during my presidency was the preservation of the Union and the abolition of slavery.

When I took office, the country was deeply divided over the issue of slavery, and the secession of several Southern states threatened the very existence of the Union. Throughout my presidency, I worked tirelessly to preserve the Union, even when it meant taking controversial actions such as the suspension of habeas corpus or the enlistment of African American soldiers.

My most famous executive action was the Emancipation Proclamation, which declared that all slaves in Confederate-held territory were to be forever free. This was a critical step towards ending slavery and ensuring the freedom and equality of all individuals, regardless of their race.

However, it is important to note that the abolition of slavery and the preservation of the Union were not accomplished solely by me or any one individual. It was the result of the efforts and sacrifices of countless individuals, including soldiers, politicians, and activists, who worked tirelessly to uphold the principles of democracy and liberty that our country was founded upon.

In the end, I believe that my presidency represented a critical moment in our nation's history, a time when we were forced to confront the fundamental questions of freedom and equality that remain central to our democracy today. While much work remains to be done, I am proud to have played a role in the progress that has been made towards a more just and equitable society for all.

Mr. President, in your view, what was your biggest regret during your presidency?

As President Abraham Lincoln, I believe that my biggest regret during my presidency was not being able to prevent the outbreak of the Civil War and the subsequent loss of life and devastation that it caused.

While I worked tirelessly to preserve the Union and avoid conflict, the deep-seated divisions and tensions that had been building for years ultimately led to war. The loss of life and destruction that resulted was a tragedy for our country and a painful reminder of the costs of division and conflict.

I also regret that I was not able to do more to promote the rights and equality of African Americans during my lifetime. While I believed deeply in the importance of ending slavery and ensuring the freedom and equality of all individuals, the reality of the time meant that progress was slow and often met with resistance.

Despite these regrets, I remain proud of the work that I and many others did during my presidency to uphold the principles of democracy and individual liberty that our country was founded upon.

While we may not have been able to achieve all that we hoped for during my lifetime, I believe that our efforts paved the way for future generations to continue the fight for a more just and equitable society for all.

Sir, if you could give your best advice to future generations what would it be?

As President Abraham Lincoln, if I were to give advice to future generations, it would be this: never lose sight of the principles of democracy and individual liberty that our country was founded upon. These principles form the bedrock of our society and are essential to ensuring the freedom and equality of all individuals.

It is important to remember that these principles are not self-executing or self-sustaining. They require constant vigilance, hard work, and sacrifice to uphold and defend. It is the responsibility of all individuals to participate in our democracy, to engage in civil discourse and debate, and to work towards policies and actions that promote equality, justice, and opportunity for all.

I would also encourage future generations to remain open to new ideas and perspectives, to seek out diverse voices and experiences, and to cultivate empathy and compassion for others. These are

the qualities that enable us to come together as a society, to find common ground, and to work towards a better future for all.

Finally, I would urge future generations to never lose hope, even in the face of adversity and hardship. Our country and our world will always face challenges and obstacles, but it is our belief in the principles of democracy and individual liberty that give us the strength and resilience to overcome them. As I once said, "The best way to predict your future is to create it." Let us work together to create a future that is just, equitable, and free for all.

References

- Arik, S., Chen, J., Peng, K., Ping, W., & Zhou, Y. (2018). Neural Voice Cloning with a Few Samples. In *Advances in neural information processing systems: 32nd conference on neural information processing sys ..* (pp. 1–11). essay, NEURAL INFO PROCESS SYS F.
- Brock, D. (2023, February 21). *The remarkable Ivan Sutherland*. Computer History Museum. Retrieved April 17, 2023, from <https://computerhistory.org/blog/the-remarkable-ivan-sutherland/>
- Dudkin, S. (2016, May 1). *If Abraham Lincoln were alive, what would you ask him?* Quora. Retrieved April 22, 2023, from <https://www.quora.com/If-Abraham-Lincoln-were-alive-what-would-you-ask-him>
- Edwards, B. (2023, January 9). *Microsoft's new AI can simulate anyone's voice with 3 seconds of Audio*. Ars Technica. Retrieved April 17, 2023, from <https://arstechnica.com/information-technology/2023/01/microsofts-new-ai-can-simulate-anyones-voice-with-3-seconds-of-audio/>
- Hao, K. (2023, April 14). *What is chatgpt? what to know about the AI chatbot*. The Wall Street Journal. Retrieved April 15, 2023, from <https://www.wsj.com/articles/chatgpt-ai-chatbot-app-explained-11675865177>
- Lock, S. (2022, December 5). *What is ai chatbot phenomenon CHATGPT and could it replace humans?* The Guardian. Retrieved April 15, 2023, from

<https://www.theguardian.com/technology/2022/dec/05/what-is-ai-chatbot-phenomenon-chatgpt-and-could-it-replace-humans>

Liu, P., Yuan, W., Fu, J., Jiang, Z., Hayashi, H., & Neubig, G. (2023). Pre-train, prompt, and predict: A systematic survey of prompting methods in Natural Language Processing. *ACM Computing Surveys*, 55(9), 1–35. <https://doi.org/10.1145/3560815>

Fabris, C. P., Rathner, J. A., Fong, A. Y., & Sevigny, C. P. (2019). Virtual reality in higher education. *International Journal of Innovation in Science and Mathematics Education*, 27(8). <https://doi.org/10.30722/ijisme.27.08.006>

Shin, D. (2018). Empathy and embodied experience in virtual environment: To what extent can virtual reality stimulate empathy and embodied experience? *Computers in Human Behavior*, 78, 64–73. <https://doi.org/10.1016/j.chb.2017.09.012>

White, J., Fu, Q., Hays, S., Sandborn, M., Olea, C., Gilbert, H., Elnashar, A., Spencer-Smith, J., & Schmidt, D. (2023, February 21). *A prompt pattern catalog to enhance prompt engineering with chatgpt*. arXiv.org. Retrieved April 17, 2023, from <https://arxiv.org/abs/2302.11382>

Wong, T. (2023, February 25). *Prompt engineering a user persona with CHATGPT and Character.ai*. Medium. Retrieved April 17, 2023, from <https://medium.com/@treycwong/prompt-engineering-a-user-persona-with-chatgpt-and-character-ai-cd36c554fa25>