Proposal and Annotated Bibliography

Title: Compassionate Tech: Developing Non-Profit AI Chatbots and AI Mental Health Screenings to Support Students in Financial Need at UVA

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Topic Overview:

When people think of college, they think of a time of exploration and personal growth for students. However, what is often overlooked is the significant mental health challenges students face, especially those from financially disadvantaged backgrounds. According to *The Healthy Minds Survey*, "44% of students reported symptoms of depression; 37 percent said they experienced anxiety; and 15% said they were considering suicide," (Flannery Ellen, Mary 2023). These statistics reflect national trends, but they raise an important question: What do these challenges look like for the University of Virginia (UVA) students?

UVA is home to twelve highly competitive schools, ranging from the College of Arts and Sciences to the McIntire School of Commerce, and the School of Engineering and Applied Science. For students in financial need, the pressures of excelling in these demanding academic environments are often compounded by the challenges of navigating tuition costs, part-time work, and limited access to resources. The stress of balancing these responsibilities can lead to increased feelings of isolation, anxiety, and depression. Additionally, students from lower-income backgrounds may face barriers to accessing mental health care, further enhancing their struggles. Exploring how financial need intersects with mental health challenges at UVA is essential to identifying effective ways to support these students.

After conducting some research, I found that UVA offers two kinds of mental health care for their students. Counseling and Psychological Services (CAPS), and TimelyCare. CAPS offers in-person services like therapy and crisis intervention, which is extremely helpful, but often has long wait times, which can discourage students in financial need who may lack the means to seek care elsewhere. TimelyCare provides virtual 24/7 mental health support. This platform implemented by UVA is great, but if an appointment is scheduled and the student is late or does not show up, they are charged a fee of $200, which may discourage students from scheduling an appointment to seek the help they need. Also,

TimelyCare was implemented in 2021, which is fairly new to students. This raises the question: is it being used?

A potential solution to these challenges is leveraging AI-powered chatbots and free mental health screenings. AI chatbots can provide immediate, accessible, free, and anonymous support to students 24/7, reducing the barriers to seeking help. These tools can assist students in managing stress, providing coping strategies, and even guiding them toward additional mental health resources when needed. For students balancing tight schedules, chatbots offer a level of convenience and flexibility that traditional counseling methods, like in-person therapy, may lack. With good marketing, specifically by professors and students at UVA. This could be something that all students notice and try out since it would be free and easily accessible.

AI-driven mental health tools could greatly benefit UVA's School of Data Science, the School of Engineering and Applied Science, and Pre-Medical students, by providing students with hands-on opportunities to apply their knowledge to real-world challenges. Initiatives like free mental health screenings and chatbots would not only enhance students' academic experience but also offer significant support to students in financial need by providing free, accessible resources. These projects would help students develop practical skills in AI design and data analysis while addressing critical mental health issues. Ultimately, such initiatives would position UVA as a leader in using AI to create equitable solutions for the student community.

A great way to get this started is by publishing my writing in *The Cavalier Daily.* As a respected student newspaper, it provides an excellent opportunity to reach a diverse audience of UVA students, faculty, and staff. Given the urgent need for accessible mental health support and the growing role of technology, *The Cavalier Daily* is the ideal platform to spark discussion about how AI can improve mental health services for students. I hope my proposal will inspire readers to recognize the potential of AI-powered tools like chatbots and mental health screenings and encourage further contributions toward developing these solutions. Ultimately, I aim for my piece to serve as a starting point for creating meaningful, innovative changes in mental health care at UVA for students in financial need.

This proposal includes research questions, methods, context, and annotated bibliographies. The annotated bibliographies at the end of this proposal include a range of sources that provide insights into the intersection of AI and higher education. These sources include peer-reviewed journals, articles, and readings from professionals, UVA students, and professors. This demonstrates how AI is already transforming academic settings, from enhancing learning to improving efficiency. They also highlight AI's potential to address challenges like mental health support and accessibility. These sources form the basis of my proposal, emphasizing the importance of incorporating AI-driven tools, such as free chatbots and mental health screenings, into UVA's support systems.

Research Questions:

1. How do mental health challenges, such as anxiety, depression, and isolation, specifically impact students from financially disadvantaged backgrounds at UVA?
2. How effective is UVA's implementation of TimelyCare in reaching and supporting students, particularly those with limited financial resources or access to technology?
3. How can AI-powered chatbots and free mental health screenings help mitigate the mental health challenges faced by UVA students in financial need?
4. How can students in UVA's Data Science, Engineering, and Pre-Medical programs contribute to the development and implementation of AI tools for mental health support?
5. What are the ethical implications of using AI for mental health support at UVA, and how can these concerns be addressed?

I began this project with a focus on AI and mental health, but as I dived deeper into my research, I decided to narrow my attention to UVA and its students who rely on financial aid. As a low-income student at UVA, I understand the challenges of transitioning into an environment where many peers openly display their higher social status. For some students, this stark contrast can contribute to a decline in mental health. This personal experience fueled my determination to find a viable solution, specifically, a free mental health resource to support those facing similar struggles.

Methods:

<u>What I've Done So Far</u>

From the beginning, I knew I wanted to focus on AI and mental health, but I didn't know exactly to whom and where. As I began my research on Virgo, a tool designed by the librarians at UVA, I noticed that thousands of journals, articles, and readings were free for me to use. As I looked through a few I noticed that UVA students have already begun writing about the impact of AI and mental health for students. This sparked my interest and I decided to move my focus on mental health resources at UVA. I didn't want to stop there. As a low-income student, I wanted to incorporate an idea that would be beneficial to those in financial need.

I collected many different peer-reviewed journals and articles and began my investigation of different types of AI, focusing on how it can benefit the mental health of college students and what can be created from AI.

Though I was familiar with *The Cavalier Daily* as a UVA student, I hadn't previously explored its full potential. Upon investigation, I learned that it is entirely student-run and operates as a non-profit. This made it the ideal platform for my story, as it reaches a diverse audience of UVA-affiliated individuals, and everyone regardless of social class can access it.

I also expanded my research to include external sources, I included perspectives from non-UVA authors to ensure my work reflected a range of viewpoints. Given the significant changes in mental health trends over the past few years, driven by factors like technology and the pandemic, it was crucial to include research from a professional level to ensure credibility and provide a comprehensive understanding of the issue.

What Will I Do Next?

To strengthen the credibility of my research, I plan to reach out to various professors, mental health experts, and specialists on Grounds for their insights and feedback on my story and research questions. By engaging with experts across disciplines, I can ensure that my approach is well-rounded and grounded in current academic and professional perspectives. This will include the ethical side of implementing AI and include how there are some downsides. For example, AI not understand human emotions and privacy.

Additionally, I intend to create a survey targeted at students, particularly those involved in organizations such as Hoos First and other low-income student groups, to gather their thoughts on the effectiveness of CAPS and TimelyCare. I will distribute this survey both in person and through social media platforms to ensure I reach a diverse range of students. Their feedback will provide a clearer picture of how these services are used. By collecting these statistics, I can better support my argument for why new, more accessible mental health resources, like AI-driven tools, should be implemented to better meet the needs of all students, particularly those from underrepresented and financially disadvantaged backgrounds.

Context:

The Cavalier Daily has published numerous articles on mental health and the use of new A I technologies by students, as well as stories related to financial aid, highlighting UVA as one of the top schools for financial support. All of these stories had to be found by doing deep research, they're not front-page articles. I have yet to see a story that covers all three topics at once. My story, *Compassionate Tech: Developing Non-Profit AI Chatbots and AI Mental Health Screenings to Support Students in Financial Need at UVA,* would fill this gap, offering something new and relevant for The Cavalier Daily audience.

When I first visited the page, the top story was about the upcoming increase in tuition for the 2025-2026 school year. This news is likely to trigger anxiety among low-income students. Providing a story that offers hope for improving mental health support, regardless of income, would offer a refreshing perspective. It would not only be of interest to students but could also inspire them to get involved in the process of creating these positive changes, making it a timely and engaging topic for *The Cavalier Daily.*

***All links to specific stories can be found in the acknowledgments section.**

Annotated Bibliographies:

1. R. Jeya, et al. "Artificial Intelligence and Mobile Apps Support Intelligent Healthcare Systems for Mental Health Services." *International Journal of Interactive Mobile Technologies (IJIM)*, vol. 18, no. 20, 17 Oct. 2024, pp. 157–168, https://doi.org/10.3991/ijim.v18i20.50743. Accessed 2 Nov. 2024.
   Summary: This research paper investigates the application of artificial intelligence (AI) and mobile apps to improve mental healthcare services. The authors explore the use of AI in diagnostics, treatment, and patient monitoring. Highlighting the potential benefits and challenges of AI-powered mental health solutions. The study emphasizes the use of mobile technology, including sensors and data analytics, to enhance early detection, personalized treatment, and efficient resource allocation in mental healthcare. The paper concludes by emphasizing the need for further research and ethical considerations in the development and implementation of AI in this field.
   Evaluation: The sources present an optimistic view of AI's potential to enhance mental healthcare, particularly through mobile apps and mental health technologies. They include examples like AI algorithms analyzing speech, text, and facial expressions showcasing AI's value in supporting limitations and providing basic mental health support through chatbots. While the sources acknowledge the need for responsible AI implementation, they could expand on challenges such as algorithmic bias, data privacy, and the limits of AI understanding human emotions.
   Reflection: This article is great for my story because it emphasizes the benefits of using AI for mental health. It includes the idea of using chatbots and technology and how it can be a good thing for people all around the world. Using this article I could use it to expand my ideas on how Covid-19 affected the public and their mental health. Additionally, I can use it as a source to explain how creating a chatbot could be beneficial and use the information provided to give clear ideas created by the authors that could also be used for my proposal. On the other hand, this article wouldn't be the best for explaining the ethical standards of using AI.

2. Nguyen, Binh An, "Evaluation of University Curriculum in Internship Preparation; Limits of Artificial Intelligence Treatment for Depression and Anxiety." *Virginia.edu*, 2022, libraetd.lib.virginia.edu/public_view/mw22v658v. Accessed 12 Dec. 2024.
   Summary: This 2022 University of Virginia undergraduate research paper investigates the potential of artificial intelligence to address shortcomings in America's mental healthcare system, particularly concerning depression and anxiety treatment. The paper analyzes the benefits of AI,

such as increased access and more accurate diagnoses, while critically examining potential drawbacks, including algorithmic bias reflecting societal inequities and the risk of misdiagnosis. Utilizing the "Technological Fix," framework, the author explores the complex interplay between technological solutions and the underlying social issues within the system.
Evaluation: Based on the article we know that AI has a great potential to improve mental health care by increasing accessibility, reducing bias, and personalizing treatment. However, concerns exist about biased data, privacy risks, and the potential impact of the doctor-patient relationship. Ethical considerations are also crucial to ensure fairness and equity. While AI can enhance care, more research is needed to address these challenges and understand its long-term effects before widespread use.
Reflection: The author of this article is also a UVA student, which helps reassure us that this topic has been a topic for discussion for a while, but not much has changed since 2022. This also helps build my argument on why I should publish this story in *The Cavalier Daily*, it will help other works by UVA students get noticed, and how it helped me with my research. Binh An Ngyuen emphasizes how AI can benefit the state of mental healthcare, and the author addresses the shortcomings of America's Healthcare, which I could use as a reference in my story. But, there is still a main concern, which is the ethical considerations of using this method in healthcare. This helped me realize that I should do more outside research on ethical considerations.

3. Syed, Ali. "Harnessing Artificial Intelligence; the Impact of the Marcus Chatbot on Mental Health Screening and Support in College Students." *Virginia.edu*, 2020, libraetd.lib.virginia.edu/public_view/9019s377v. Accessed 25 Nov. 2024.
Summary: This undergraduate research paper examines the Marcs chatbot, an AI-powered tool designed to screen for and support college students experiencing depression. The study uses a mixed-methods approach, combining quantitative data analysis with qualitative user feedback, informed by relevant literature on AI in mental health. The research framework is the Social Construction of Technology, exploring the interplay between technology, society, and the college environment. The paper investigates the chatbot's effectiveness, impact, and ethical considerations within the context of rising mental health concerns among students. The ultimate goal is to assess the potential of AI chatbots to improve mental healthcare accessibility and address the growing demand for services.
Evaluation: The Marcus chatbot is an AI tool designed to provide mental health support to college students, focusing on the early detection of depression. It offers personalized, accessible, and stigma-free assistance, engaging students in meaningful conversations. Developed with input from professionals and students, Marcus aims to normalize help-seeking behavior and provide valuable insights for improving campus mental health problems.
Reflection: This article was also created by a student from the University of Virginia, which furthers my point on the research that has already been done and how I can emphasize it in my story. The Marcus chatbot is almost identical to what I am arguing to create. Using this as a source and as a reference in my story will show readers that something like this has already been created. This is a perfect example of something I could reference in my story and make connections/changes so we can enhance its ability. The Marcus Chatbot could be the start of something extraordinary on not only the UVA grounds but also on campuses around the country.

However, I would like to research more on how exactly it was used and if it made a change on campus.

4. Chen, Jing, et al. “Artificial Intelligence Significantly Facilitates Development in the Mental Health of College Students: A Bibliometric Analysis.” *Frontiers in Psychology*, vol. 15, 7 Mar. 2024, https://doi.org/10.3389/fpsyg.2024.1375294.
   Summary: This research paper uses bibliometric analysis of the Web of Science database to examine the growing field of Artificial intelligence applications in college student mental health. The study analyzes publication trends from 2003-2023, identifying key journals, authors, countries, and research topics. It reveals a surge in publications, particularly focusing on AI’s role in predicting and diagnosing mental health issues like depression and anxiety, primarily using machine learning. The research highlights the need for increased international and interdisciplinary collaboration to advance this field and address ethical considerations surrounding AI’s use in mental healthcare. The authors ultimately conclude that AI significantly facilitates the development of the mental health of college students.
   Evaluation: The sources highlight a growing body of research on AI’s potential to address mental health challenges among college students, particularly depression and anxiety. Studies show a surge in publications from 2018-2023, focusing on AI technologies like machine learning for the prediction, diagnosis, treatment, and prognosis of mental health disorders. Key applications include using AI to predict mental health crises, personalize treatments, and monitor progress. The research also emphasizes the importance of ethical considerations, such as data privacy and bias. Overall, AI has the potential to revolutionize mental healthcare for college students, but ethical challenges must be addressed for responsible implementation.
   Reflection: With this information, I can enhance my story by highlighting the growing role of AI in addressing mental health issues like depression and anxiety among college students, as stated in the article. The focus on machine learning for predicting and diagnosing mental health challenges strengthens my argument for AI’s potential in improving student mental health at UVA. Additionally, the study’s emphasis on ethical considerations, such as data privacy and bias, adds depth, ensuring a responsible approach to implementing AI in mental health care. This research supports my proposal by showing AI’s promise in enhancing mental health services for students, particularly those in financial need.

5. Cai, Yinying, and Ling Tang. “Correlation Analysis between Higher Education Level and College Students’ Public Mental Health Driven by AI.” *Computational Intelligence and Neuroscience*, vol. 2022, 12 Sep. 2022, pp. 1–11, https://doi.org/10.1155/2022/4204500. Accessed 23 Oct. 2022.
   Summary: This research article investigates the correlation between higher education levels and college students’ mental health using artificial intelligence. Traditional methods like questionnaires are deemed insufficient, so the authors propose a model employing convolutional neural networks and random forest algorithms to analyze data from various sources, including heart rate and social media text. The resulting model achieves an 87.5% accuracy rate in determining the correlation surpassing other AI models tested. The study concludes that AI offers a more precise and efficient approach to analyzing this complex relationship.
   Evaluation: Cai and Tang’s research article uses AI to analyze the relationship between higher education levels and the mental health of college students, offering a novel approach compared to

traditional methods. By employing convolutional neural networks and random forest algorithms, the study achieves an impressive 87.5% accuracy in identifying correlations. The use of data from heart rate and social media text adds a multi-dimensional perspective, enhancing the analysis. The findings suggest AI can provide precise insights into mental health, with implications for early interventions, while addressing ethical concerns about data privacy.
Reflection: This research article adds valuable insight to my story by demonstrating the potential of AI in analyzing complex factors affecting college students' mental health. Their use of convolutional neural networks and random forest algorithms to study the relationship between education level and mental health supports my argument for AI's ability to provide precise, data-driven insights. The inclusion of heart create and social media data enhances the analysis, aligning with my focus on comprehensive approaches to mental health. Their findings emphasize AI's capacity for early interventions, which strengthens my proposal for accessible mental health resources at UVA.

Acknowledgments:

The Cavalier Daily*:* I used it as the platform I want to pitch my story. Additionally, I found specific articles that helped inspire the context section of this proposal.
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NotebookLM: I used this platform to help me with my annotated bibliographies, it helped me find and understand information much quicker.
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