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2021 Spring Hack-A-Roo

1. Identify a real-world issue or problem

The real-world issue we have identified is a decrease in motivation, productivity, and mood in students during the COVID-19 pandemic. Isolation coupled with anxiety surrounding sickness and the switch to online schooling has put extreme stress on many students who have in turn lost the motivation to or ambition to keep up with school-related tasks. A survey from OneClass indicated that among 14,000 underclassmen in college, 85% reported that COVID-19 had a negative effect on their grades in the Fall of 2020 (St. Amour, 2021). The main reasons students cited for this were changes in academics and mental health (St. Amour, 2021).

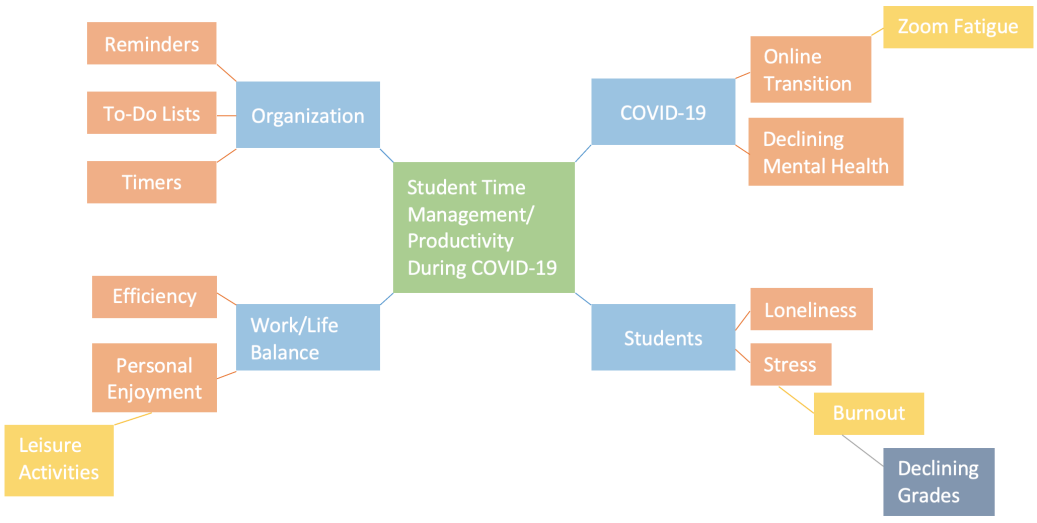
This phenomenon is important because students' performance in school and their mental health will have long-term effects on their lives long after the resolution of COVID-19. Students who have developed poor study and time-management habits will likely have a difficult time transitioning back to in-person classes or finding a job post-graduation. Additionally, isolation and subsequent mental health issues can persist long-term and affect students in every area of their lives. This issue affects all students who have had their classes and social lives disrupted in some way by the COVID-19 pandemic. Our solution is an AI-powered virtual pet/task assistant that will provide companionship to boost mood and motivation while keeping students on task.

2. Explain what kind of data (structured vs unstructured) you would need to gather to understand, analyze, and/or solve the real-world issue or problem?

Structured data is clearly defined and searchable by nature (quantitative). This data would be gathered directly from the user by asking for numerical data on a daily basis. One such question would ask the user "Do you feel prepared to tackle today's tasks?" prompting for a response on a scale from 1-5. The purpose of this structured data would be to understand the user's perception of their own mood and compare that to the unstructured data to detect patterns or relationships.

Unstructured data requires more effort to understand and is qualitative by nature. This data would also be gathered from the user's subjective interactions with their digital companion. The app will analyze key words and phrases that the user says when speaking with the companion and use machine learning to compare that to the structured dataset from the same day to construct a holistic understanding about the user's mood, the user's perception of their mood, and the relationship between the two.

Attribute Map



Identify at least 2 relevant datasets and explain what kind of analysis (regression, classification, or/and cluster) that you'd do to analyze the problem.

There are three relevant datasets to analyze the problem: First, the relationship between COVID-19 and grades. Second, the relationship between COVID-19 and mental health. Third, the relationship between mental health and gaming. While the first two datasets justify that there is a problem regarding productivity, which is linked to time management, the third dataset proposes a solution to the problem. As mentioned before, a majority of students reported that their grades and mental health declined after the start of COVID-19 (St. Amour, 2021). Meanwhile, there are psychological benefits to gaming. In National Literacy Trust's video game survey for students aged 11 to 16, they found that "many young people said playing video games helps them either deal with, or escape from, stress and difficult emotions" (2020). Because we are dealing with the relationships between independent (COVID-19, gaming) and dependent variables (grades, mental health), regression should be used to predict the state of the students' personal and professional success based on whether the data is before or after the start of COVID-19 and the amount of time they spend playing games.

3. Explain what kind of Machine Learning models (supervised vs unsupervised) that you'd recommend solving the issue or problem

To develop our app and determine its viability as a solution, we would need to use supervised machine learning to analyze the relationship between different variables such as grades and the COVID-19 pandemic, student's mental health and the COVID-19 pandemic, and gaming's relationship to mental health. We would use regression analysis to find relationships

between these variables that would justify creating an app that pairs gaming with real-world task completion.

In terms of the app, we would use unsupervised and supervised machine learning to gather data from the user and improve their in-app experience. Using unsupervised learning, our app would gather data on users' classes, lives, and mood in order to provide companionship, motivational phrases, and time management assistance. This would include data such as which classes the user is enrolled in, how they are feeling, and for how long they would like to set a task timer. Supervised learning would provide the AI with the conversational phrases that would make up the companionship aspect of the app.

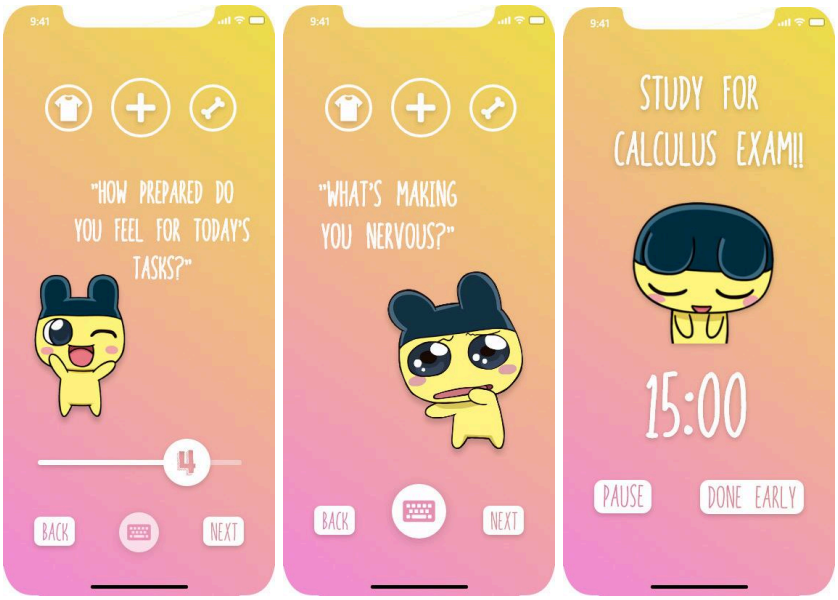
4. Fully explain your proposed solution

To help students with productivity issues, an AI pet assistant game provides a fun and engaging solution. There are four main features. The first is the conversation feature. When nothing is scheduled, students can tap the keyboard button to have personalized conversations with their pet based on user input, similar to a chat bot. The second feature is the "To-Do List" button. Students can insert their schedules and include a range of time to complete each task, which sets off a timer at the designated time. This then leads the user to the timer's "Lockdown Mode." Students may not log out of the app within the set range of time. The timer pauses when the user leaves the app, preventing students from getting distracted by their phones. After certain time intervals, the AI pet keeps users accountable by reminding them of tasks and encouraging them through motivational phrases that can be received on their phones. To account for early completion, the timer screen will have a "Done Early" function and a "Cancel" function that allows users to return to the main screen. Once a task is complete, users earn collectibles as

rewards for their AI pet. Collectibles range from backgrounds to new outfits. Next to the “To-Do List,” will be two buttons: “Treat” and “Collectibles.” The “Treat” feature allows users to feed their pets. The “Collectibles” feature on the other hand allows users to view collectibles earned from completed tasks and customize their virtual pet.

This AI virtual task assistant is unique in that it incorporates productivity with gaming. Games are usually associated with being distracting. However, this app makes finishing tasks fun and engaging. This solution motivates users — especially those who enjoy playing games — into becoming more productive. Students will find completing tasks more enjoyable when it is tied to winning rewards. The timer function also prevents users from phone distractions. The virtual pet can boost students’ mood, positively impacting students’ mental health. The AI pet assistant can also gather data from a user’s input to develop personalized phrases tailored to the person using the app, improving users’ in-app experience.

A visual representation of your project and the desired products/outcomes



5. Explain the social and cultural Implications of the solutions

The end-users for our solution are students who are struggling with time management and productivity habits. Our app is designed to boost productivity and improve time management through bettering the moods of our users through a reward-based game. From high school to post grad, our app is available to all who need a tool to help them want to complete the tasks they need to finish on time.

We developed this app due to an issue accentuated by the pandemic. The pandemic and quarantining has affected so many students mentally, emotionally, and physically; one of the biggest concerns being poor time management. A sudden and dramatic change in situation, as a society, has led to many struggling to live like they did prior to the pandemic. However, the pandemic has not halted school for students in the midst of these struggles. As a result, poor time management and lack of productivity has been a major issue brought to light as a common issue amongst students. If students continue to have poor time management and productivity habits, then it will most likely stick with them after the resolution of COVID-19. Meanwhile, isolation and subsequent mental health issues may also persist long-term. These lasting effects can hinder students' success in every aspect of their lives including work, family, etc.

With the AI virtual pet/task assistant, students can increase their productivity through an interactive game. Not only does the app improve time management skills and better users' moods, but it also prepares students for the workforce. Proper time management is a habit that is built through repetition and reinforcement. When done enough, students can become more productive on their own will- which, in the grand scheme of things, leads to hard working members of society due to improved work ethic. By teaching essential life skills through a reward-driven game, students can grow and prosper in an engaging and exciting way.

References

National Literacy Trust. (2020, August 12). Video game playing and LITERACY: A survey of young people aged 11 to 16. Retrieved April 05, 2021, from https://literacytrust.org.uk/research-services/research-reports/video-game-playing-and-literacy-survey-young-people-aged-11-16/

St. Amour, M. (2021, January 5). *Survey: Pandemic Negatively Affected Grades This Fall*. Inside Higher Ed. https://www.insidehighered.com/quicktakes/2021/01/05/survey-pandemic-negatively-affected-grades-fall.