CSC110 Project Proposal
Educational Crisis - A Closer Examination on the Correlations Between Covid-19 and School Closures Around the Globe

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Problem Description and Research Question

COVID-19 profoundly impacted students', especially international students, learning environment and strategies. **Therefore, we are curious about how this global pandemic correlates with school closures all around the world as time passes, which is one of the main influencing factors that thoroughly changed our way of learning and living.**

As a group of common students, COVID-19 changed our way of learning from face-to-face education to online classes for some time intervals. However, after COVID-19 eased a little bit, some of our schools converted back to the traditional in-person learning classes. Frequently switching between different learning environments and methods is unhealthy for our personal development because we need time to get accustomed to new things, and it is hard for us to normally keep up with the pace of our teachers in this condition.

As a group of international students, we were energetic and excited about future university life. However, everything became harsh and unpredictable after the emergence of COVID-19. We need to take into consideration a lot of things than before like expensive flight tickets, personal safety, and potential school closures.

Therefore, we aim to get clearer insights into the relationship between some global pandemic events like COVID-19 and educational changes like school closures, so that we could be more prepared in countering the impacts from them.

Also, from a broader scope, our project could provide some intuitions to some institutions and schools about the real trend of school closures and COVID-19 cases, so they could identify if they made a correct choice of closing/opening schools, if they implement some practices on time, or if they need some improvements in handling the global pandemic. Lastly, we could treat our project as a reference for future possibilities like if another similar catastrophic event happened, what will the educational industry react, and how should the educational industry handle the situation.

Dataset Description

We have identified two main datasets that will be relevant for our project's implementation.

These are:

1. Global School Closures for COVID-19 – Obtained from Kaggle, compiled by Saleh Ahmed Rony, sourced from UNESCO
2. COVID-19 Data Repository by the Center for Systems Science and Engineering (CSSE) at Johns Hopkins University – Obtained from GitHub, compiled by JHU, sourced from WHO, ECDC, DXY, US CDC, etc.

Both datasets will be stored in a Comma Separated Value file, which will allow us to read from them easily through Python's csv library.

Furthermore, both datasets are very credible as they are sourced from multiple sites, including but not limited to WHO, ECDC, and US CDC. Furthermore, these datasets are also licensed under the Creative Commons Attribution 4.0 International (CC BY 4.0), which allows us to utilize these data for our own needs.

The datasets that we have downloaded and utilized in this project were chosen because they were compiled in a way that allows easy access and manipulation. By using datasets that are already organized could improve the efficiency and robustness of our program.

The Global COVID-19 Dataset (Time series) has the following structure:

Province/State	Country/Region	Lat	Long	1/22/20	1/23/20	1/24/20	...
	Afghanistan	33.93911	67.70995	0	0	0	...
	Albania	41.1533	20.1683	0	0	0	...
...	...	...	...	...	...	...	...

The headers extend up until today.

The US Data set for COVID-19 (Time series) will have a little bit of variation, but it is generally the same.

The School Closure Dataset has the following structure:

Date	ISO	Country	Status
17/02/2020	CHN	China	Partially open
17/02/2020	MNG	Mongolia	Closed due to COVID-19
...	...	...	...

The data is organized by entries of different country each day.

Computational Plan

Our project will be separated into 2 parts: data processing and Graphical User Interface (GUI) implementation.

Processing Data

To make those datasets that we have downloaded tidy and utilize them in our program, we will firstly read the data into Python with help of the Python *csv* library.

Then, we will convert raw data into many data classes so we could easily manipulate those data in practice.

GUI Implementation

Currently, we plan to use *PyQt5* to generate an interactive user interface, *Matplotlib* to plot graphs, and some other helper tools like Qt Designer and other libraries.

We will implement the following functionalities, or parts:

- Interactive COVID-19 cases and deaths and school closures visualizations supporting filtering, grouping, sorting functionalities, etc.

  We will implement most algorithms by ourselves.

- Interactive table view of the visualizations above.

With a GUI, users of our application could quickly scan the data that we have provided and create their own plots by filtering the data by their will. Also, they could check which point on the graph may correspond to which observation.

With the help of our program, people could view, compare, and even predict the trend of the COVID-19 pandemic. Furthermore, we can also answer our research question by quickly filtering countries around the world and attempt to generalize a relationship between the trend of COVID-19 and school closures.

With these technical implementations, we believe that the impacts brought by the COVID-19 Pandemic would be conspicuous and people could formulate solutions towards the impacts illustrated.

References

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