

Capstone Project

Leah Pope

Learning During COVID-19 Sentiment Classifier

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Hello!

I'm Leah Pope

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This project explores the question...

"What is the public sentiment in the United States on K-12 learning during the COVID-19 pandemic?"

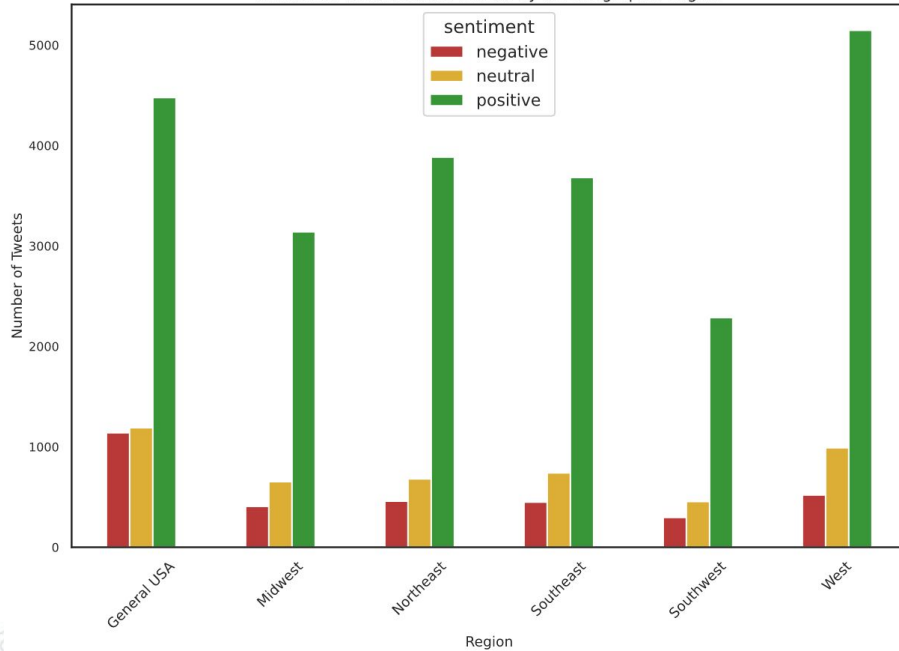
Methodology

1. Tweets from Users across the US
2. Label sentiment - Positive, Negative, Neutral
3. Discover trends through EDA & Topic Modeling
4. Create text classifier to detect sentiment in new Tweets using Natural Language Processing & Supervised Machine Learning



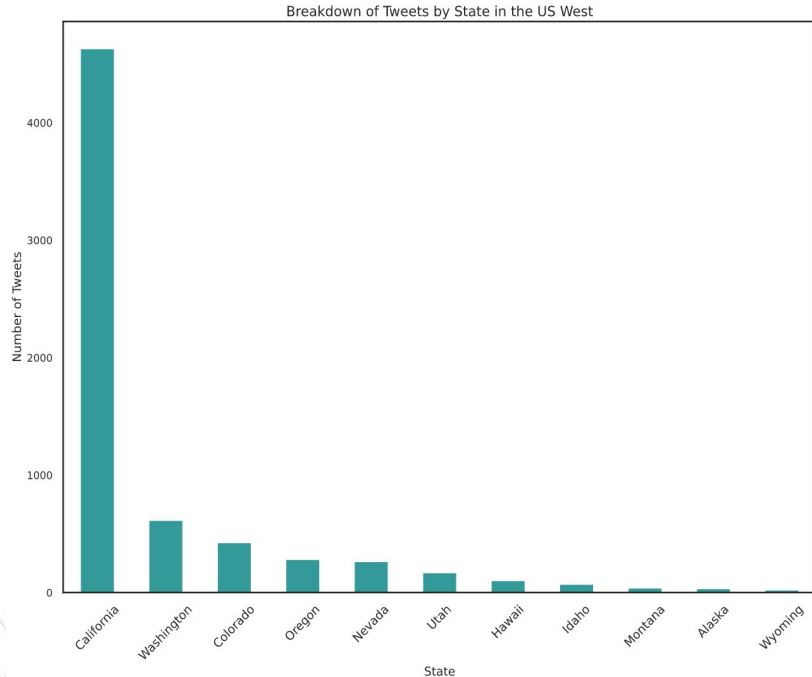
Exploratory Data Analysis

Sentiment Breakdown of Tweets by US Geographic Region



- ⊙ Vast majority of Tweets have Positive sentiment
- ⊙ True for every Region and every State in every Region
- ⊙ Suggests that Twitter is being used to communicate positive statements on Education during the COVID-19 pandemic

Exploratory Data Analysis

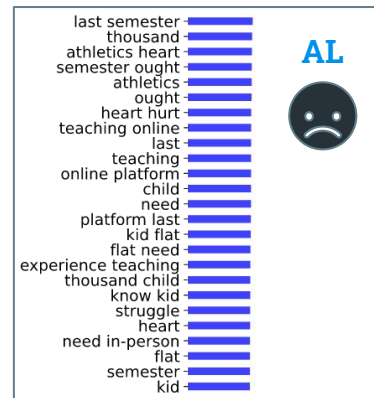
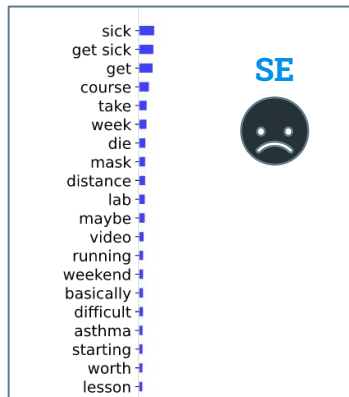
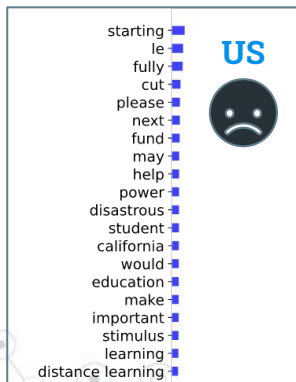
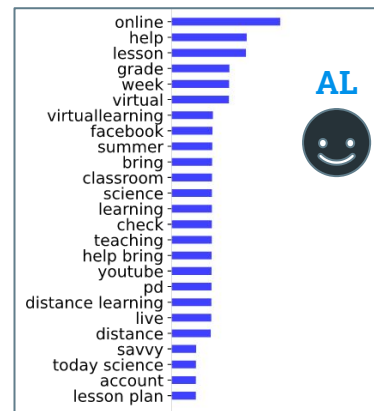
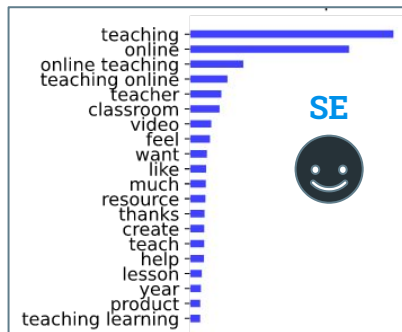
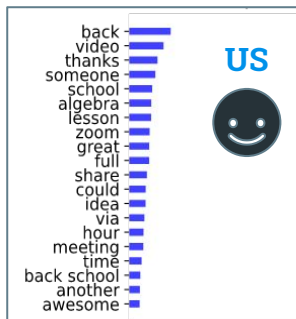


2 Regions have a 'leading' State with more than 2 x the # of Tweets than the next closest State

West - 69.6% of Regional Tweets from California followed by 9.3% of Tweets from Washington

Southwest (*not shown*) - 71.50% of Regional Tweets from Texas, then 18.40% of Tweets from Arizona

Topic Modeling



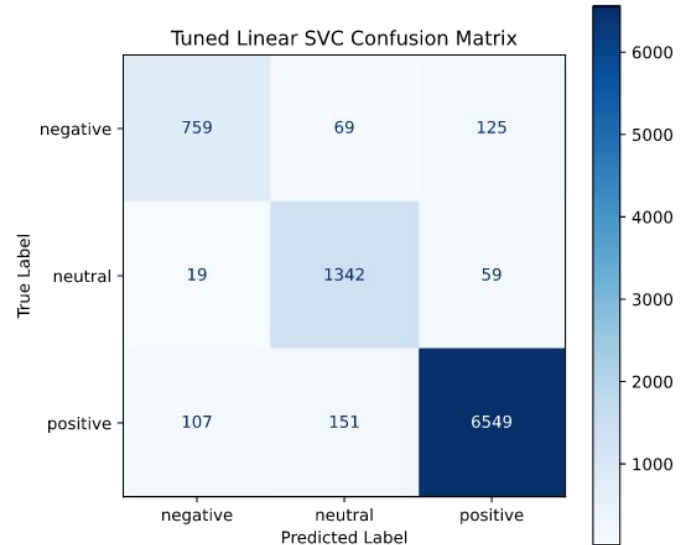
Sentiment Classifier

- Final model had Weighted F1 Score of **94%**
 - Balances Precision and Recall
 - Addresses class imbalance (73.9% of Tweets are Positive)





Training Accuracy:0.9827			Testing Accuracy: 0.9423	
Training Weighted F1:0.9828			Testing Weighted F1: 0.9423	

	precision	recall	f1-score	support
negative	0.86	0.80	0.83	953
neutral	0.86	0.95	0.90	1420
positive	0.97	0.96	0.97	6807

accuracy			0.94	9180
macro avg	0.90	0.90	0.90	9180
weighted avg	0.94	0.94	0.94	9180

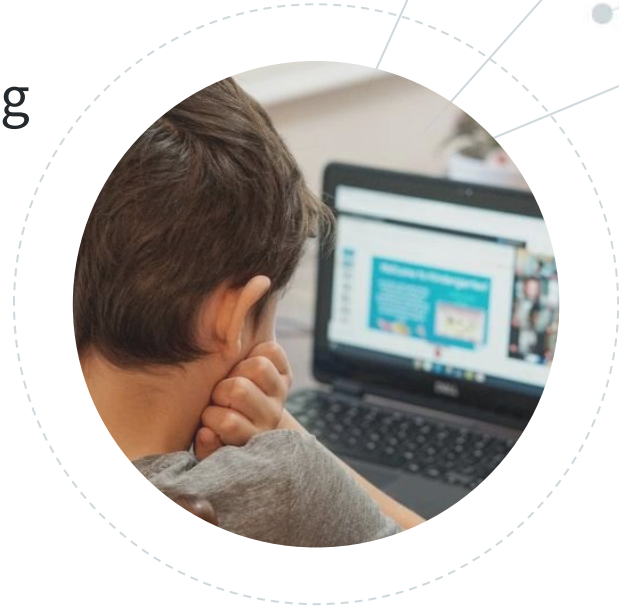


Sentiment Classifier Predictions

@jac___13 Sorry Jackie! I've kept our kids fully remote, even opting out of the hybrid model. I just can't trust other outside of my bubble right now. At least you guys in K-12 are in the earlier phases to get vaccinated. My wife in higher-Ed is not. I truly feel for educators right now.	
Parents! 🗣️ @DaytonLive365 is offering a free "virtual field trip" for local K-12 students from Feb. 1 to March 14. Register here for access to stream Grammy-nominated duo, Black Violin: https://t.co/XR29EKm2TT https://t.co/mCb6W2vUZp	
Screw the open schools COVID movement for damaging the term open schools. An Open School is a K-12 self-directed democratic school. JCOS in Denver Colorado is the last Open School in USA. Here's an EP we released w/ a former student & teacher. https://t.co/3hJ2sGwMLD https://t.co/jblfpO80UP	
There are two parts to the bill; the second would require districts to offer a 5 day per week, in-person option for all students, but only *after* the completion of vaccination phase 1b. K-12 teachers and staff are included in SDMAC's 1b plan.	

Future Work

- ◎ Dashboard Apps
 - Customizable Topic Modeling
 - Classify streaming Tweets
- ◎ More Data Collection



Thanks!

Questions?

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Credits:

Additional Data: Kaggle [Tweets about Distance Learning](#)

Presentation template: [SlidesCarnival](#)

Photographs: [Unsplash](#)