CEO SLIDE DECK

EdTech Synergy Innovators (Team 53)

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Problem Statement

In 2020, the COVID-19 pandemic affected the education ecosystem, impacting students, teachers, and school districts. In order to continue melding young minds, school districts deployed online learning tools to facilitate classes during quarantine.

Objectives

1 To explore the data available to us: frequently used learning platforms, demographics and regions access to online learning.

2 To quantify differences in tech engagement across different populations via statistical models.

3 To provide educators with resources to inform them of tech engagement level in their district and top ed-tech products.

Project Goals

Goal 1 | Exploratory Data Analysis

Through EDA, our team hopes to implement visualizations to better understand the data and interactions between variables.

Goal 2 | Model Building

Through Modeling, our team hopes to quantify the relative digital engagement across different demographics.

Goal 3 | Deliverables

Through Deliverables, our team hopes to advise educators with a dashboard and chatbot.

Modeling

To quantify the impact of various demographic and geographical predictors, we constructed 3 models that predict tech engagement (table on right). The tuned random forest performed best with the lowest error rate.

METHOD
Glm, dtree, and randomForest in RStudio

PREDICTORS
locale, regions, pef2, sector2, Semester, pct_black.hispanic, pct_free.reduced, pp_total_raw

RESPONSE
Log_engagement_index |"Total page-load events per one thousand students of a given product and on a given day."

RANDOM FOREST
~190 trees, and 6 branch nodes yielded the best tuning for appropriate fitting and highest accuracy

MODEL	ROOT MEAN SQUARE ERROR
generalized linear model (AIC- stepwise)	2.735586
decision tree (pruned)	2.848849
random forest (tuned)	2.718192 (lowest error, highest accuracy)

The random forest model performed best, and informed us that **school districts with lower per pupil total expenditures and high rates of free/reduced lunch had lower rates of Engagement.**

Dashboard & Mobile App

Our team initiated a visualization dashboard development using Tableau to gain deeper insights into student profiles and their pandemic usage of digital products. Tableau, including Tableau Mobile, provides convenient access to data on the go.
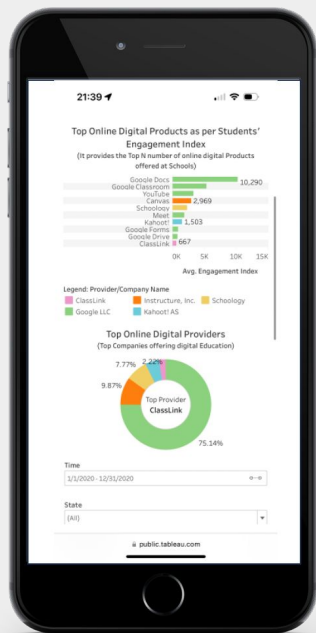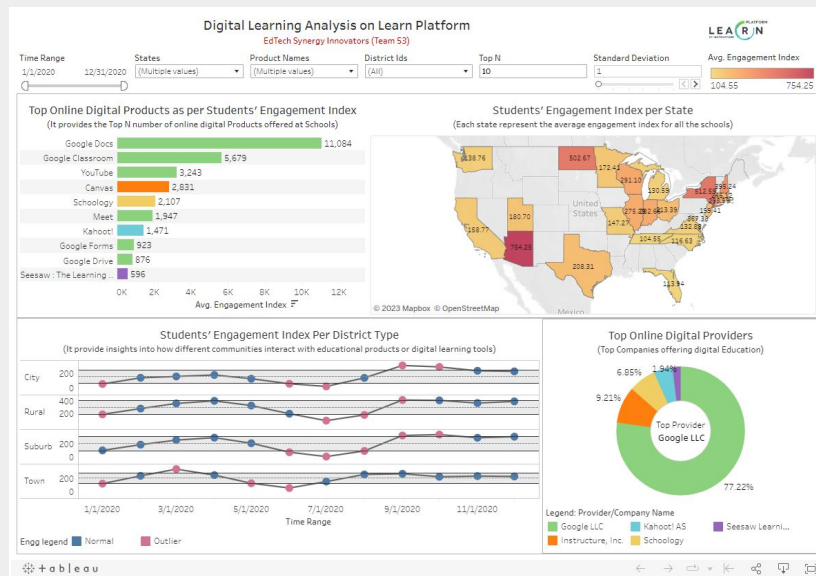

TAKEAWAYS
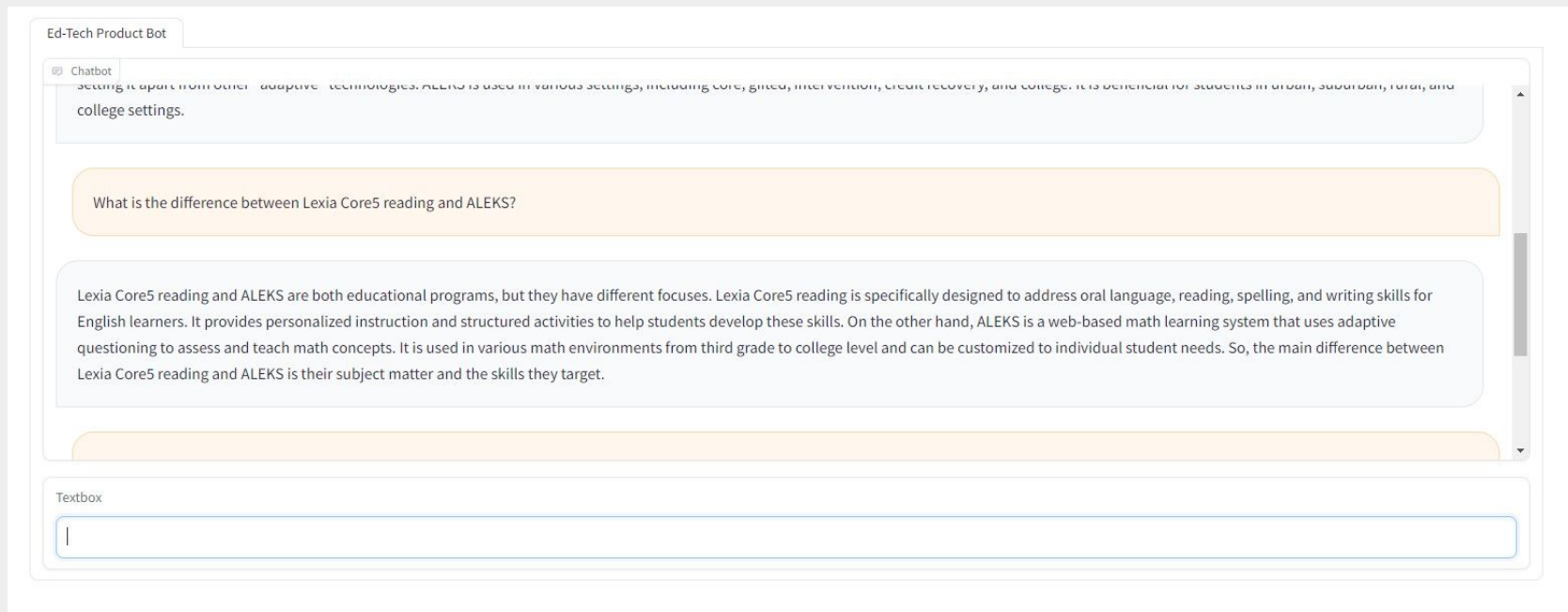
Google LLC was the top online digital provider.

Student engagement peaked in April and September. Usage decreased during summer and winter breaks.

TOP DIGITAL PROVIDER / STUDENT ENGAGEMENT DASHBOARD

Chatbot

An Ed-Tech Product Chatbot, powered by OpenAI's ChatGPT, has been developed to respond to inquiries about various online learning solutions. Integrated with a user-friendly web interface through Gradio, this chatbot can compare online learning solutions and assist educators in identifying products that best suit their requirements, especially in a landscape where there is an abundance of online offerings.

Conclusions

MODELING

From the models, we were able to quantify the impact of the following different demographics on student tech engagement.

School districts with lower per pupil total expenditures and high rates of free/reduced lunch had lower rates of Engagement.

DELIVERABLES

The Tableau Dashboard is a user-friendly tool for exploring student engagement and learning data. With a mobile app, it's easy to use on the go.

Our EdTech Chatbot uses artificial intelligence to help with edtech product questions, offering an efficient way for educators to pinpoint products that meet their requirements

Recommendations & Next Steps

✦ We recommend the continued research and collaboration of school districts with data scientists to **identify at-risk populations of low tech engagement** rates. Ensuring they have access to the resources is key to students' success.

✦ We recommend the continued improvement of the deliverables. In predictive modeling, we covered 3 different models, but would **recommend testing different models like XGBoost** which could provide higher predictive accuracy.

✦ In the dashboard, we recommend the **incorporation of data filters when consulting different geographical regions** and locales. Tuning the dashboards for personalized consulting sessions with school districts will make the data you present representative of the communities you interact with.

✦ In the chat bot, we recommend **making it accessible through different online portals to school administrators** who may have questions about digital learning resources. Having that type of assistance at their fingertips will help them make informed decisions about providing the resources and funding for their students' success.

Overall, there is still more work that can be done on the front of research, but we hope that our recommendations provide a solid launching point to advise school districts on the next steps they can follow to ensure the success of each and every student via digital learning resources.