LearnPlatform-CarR^2 Consultancy Project

Distance Learning and Effects from the COVID-19 Pandemic

Introduction – Project Personnel

Large project group working collaboratively:

- CarR^2 Data Science Team (A. Carr, lead)
- LearnPlatform lead contacts
  - Maggie Smith, Dir. of Research
  - John Watson, Dir. of Engineering
- Customer knowledge
  - Gail Strong, Dir. of Market Research
  - Wendy Lite, Dir. of Marketing Outreach
- Other key project team members
  - Research
  - Programming
  - Accounting & Finance

Digital Learning Market Trends

Figure 1

From "E-Learning Market in the US to Grow by $ 21.64 Billion During 2020-2024 | Evolved Learning and Education Landscape to Boost Growth | Technavio," by Business Wire, n.d. Copyright 2022 by Business Wire.

Project Background & Goals

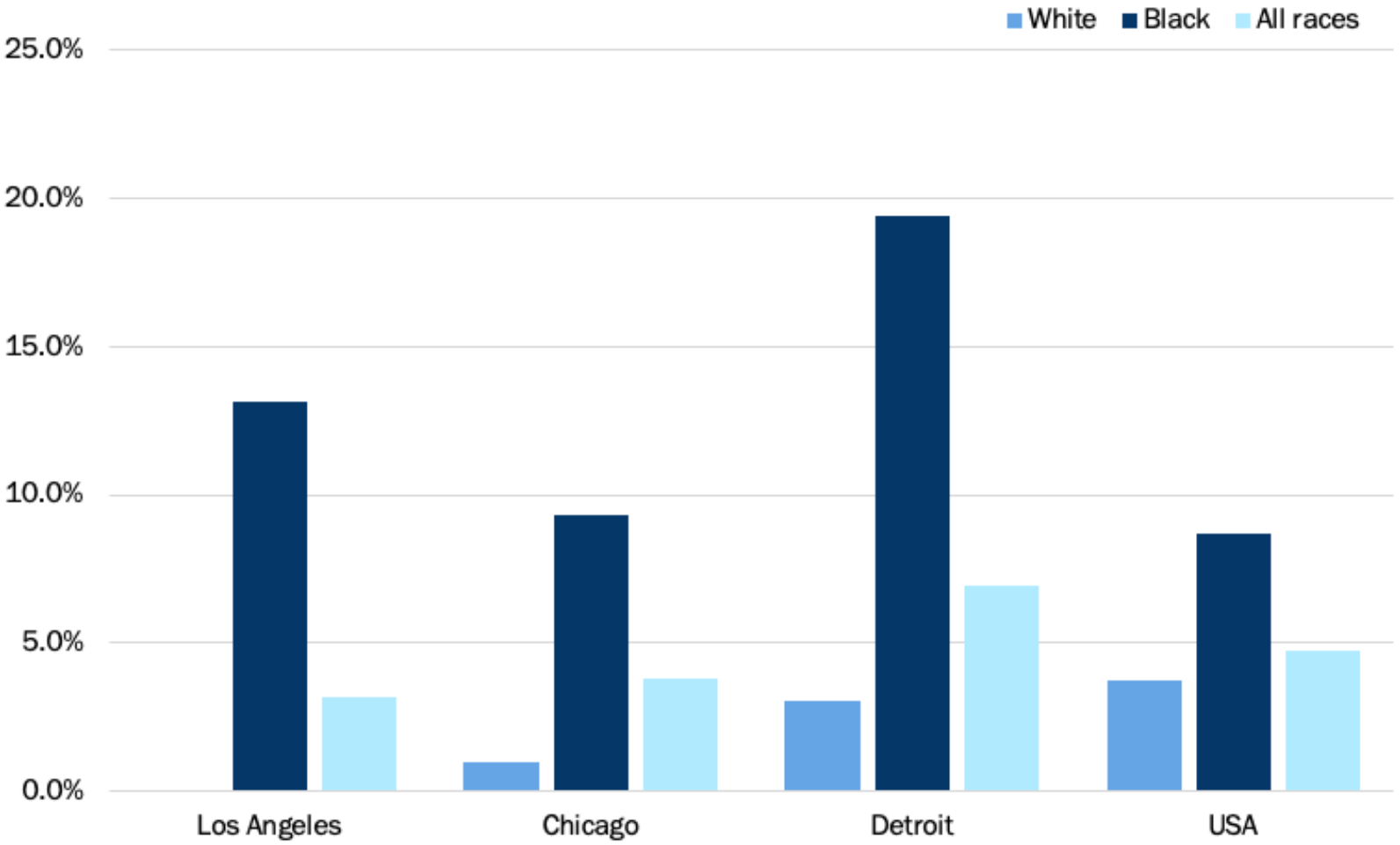
- 49.4 M K-12 school age children
- COVID-19 effects
- Rapid growth of digital learning opportunities (93%)
- Widening gaps in access
- Work toward all children having sufficient access to digital education resources

(NCES, n.d.; US Census Bureau, 2020)

Disparities in Access

Figure 2

Device is rarely or never available for learning, by race for three selected metro areas and US

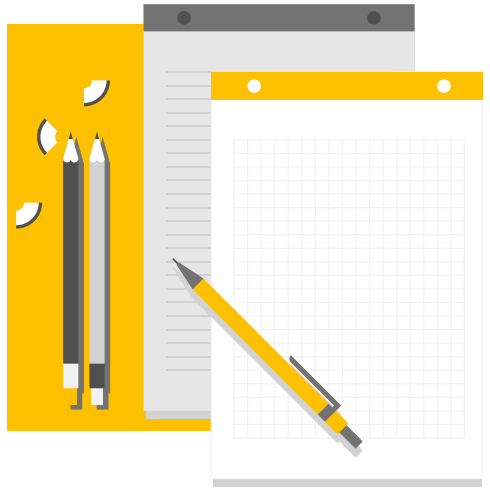


Source: US Census Bureau Household Pulse Survey

From "Unequally Disconnected: Access to Online Learning in the US," by V. Collis and E. Vegas, 2020, *Education Plus Development*. Copyright 2022 by The Brookings Institution.

Business Questions Identified

- Current state of online engagement? Are there influencing factors?



- Pandemic effects on engagement? Some groups impacted more?

- Can certain measures improve online engagement for groups facing access challenges? For all students?

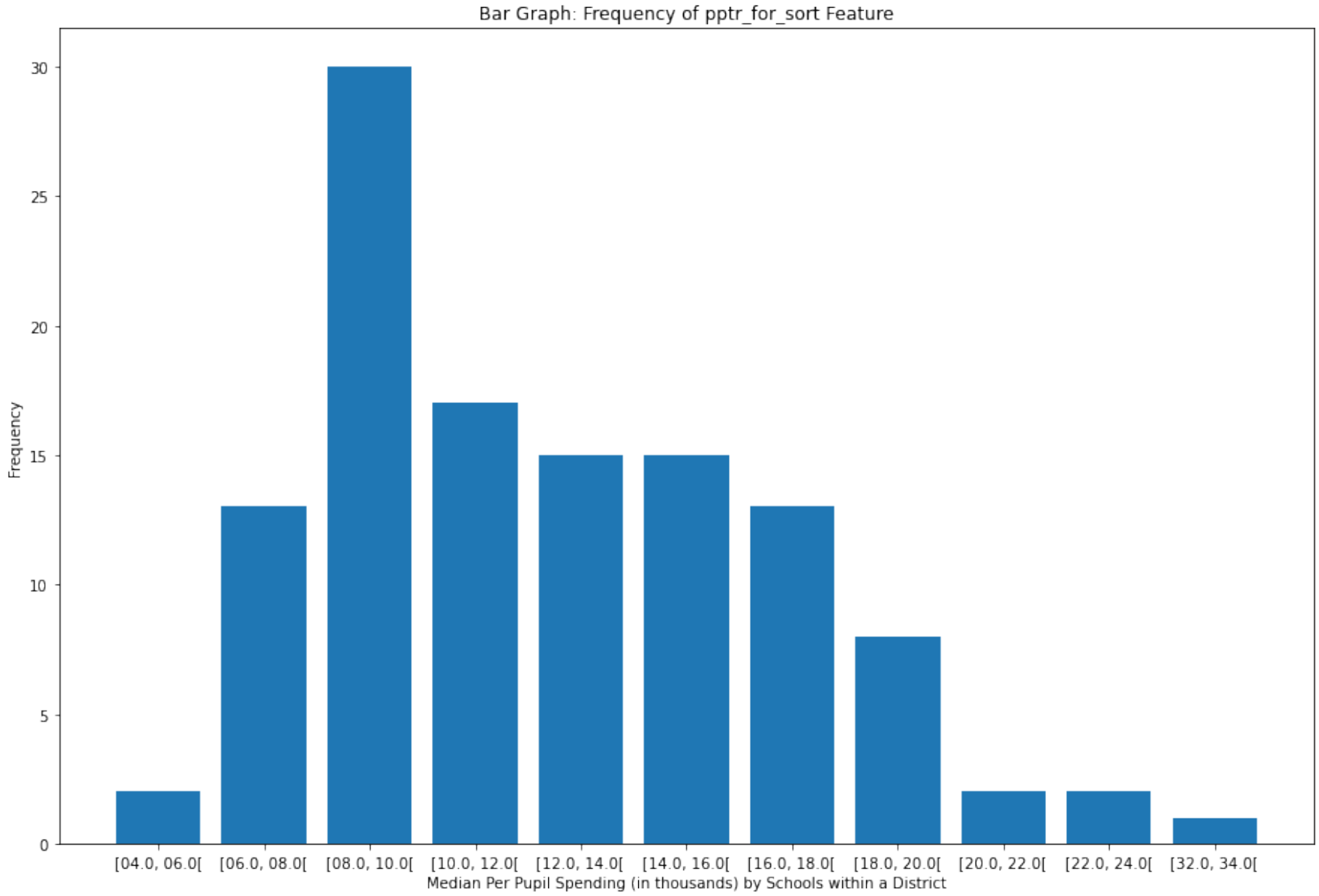
Business Objectives

- Objective 1: Describe
  - Summarize and visualize data to gain insights

- Objective 2: Predict
  A. Which student populations face gaps in access
  B. Which public policy actions positively affect access and engagement

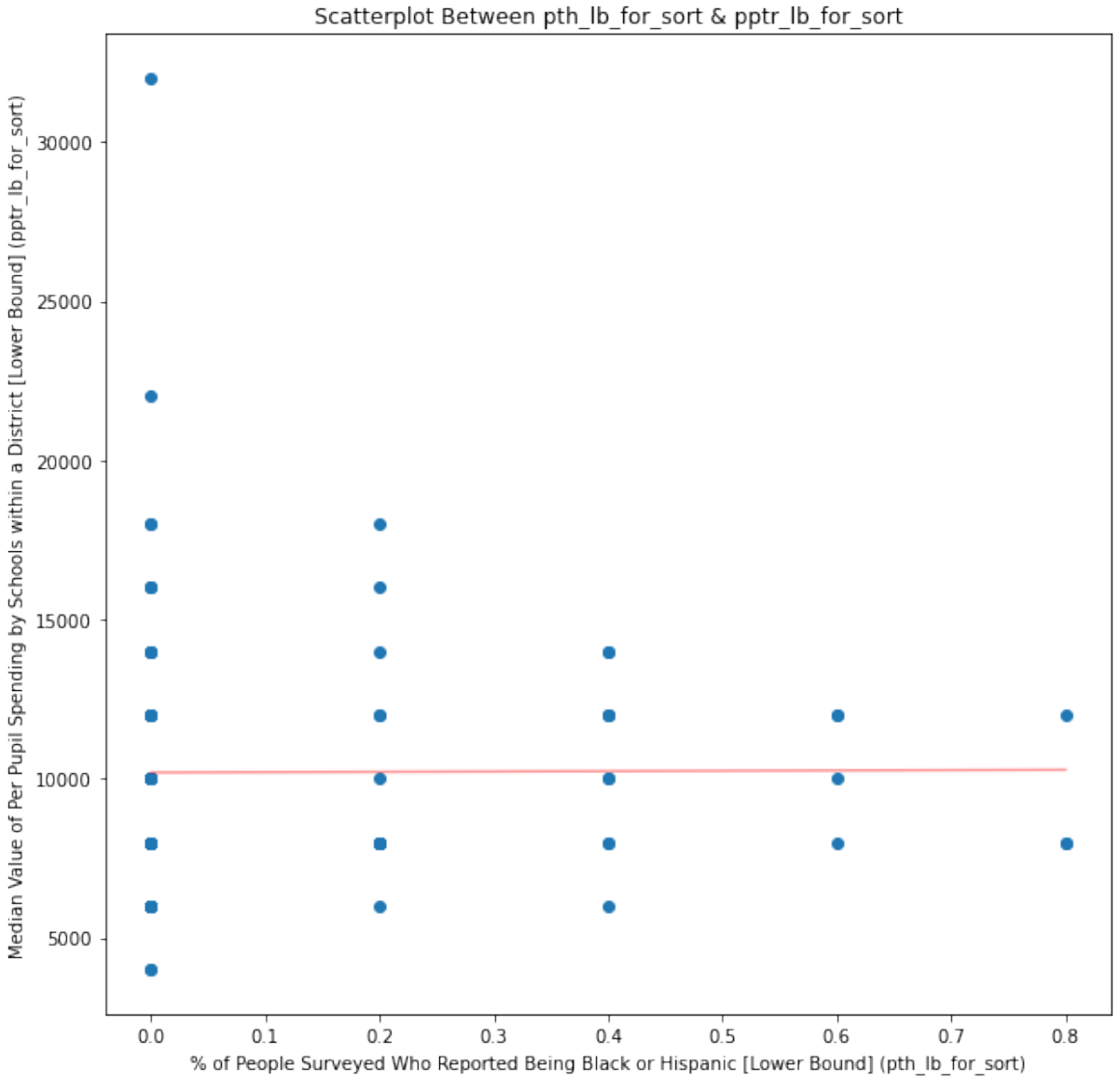
LearnPlatform Data Visualizations

Figure 3

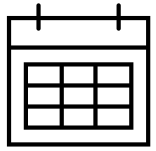


LearnPlatform Data Visualizations

Figure 4

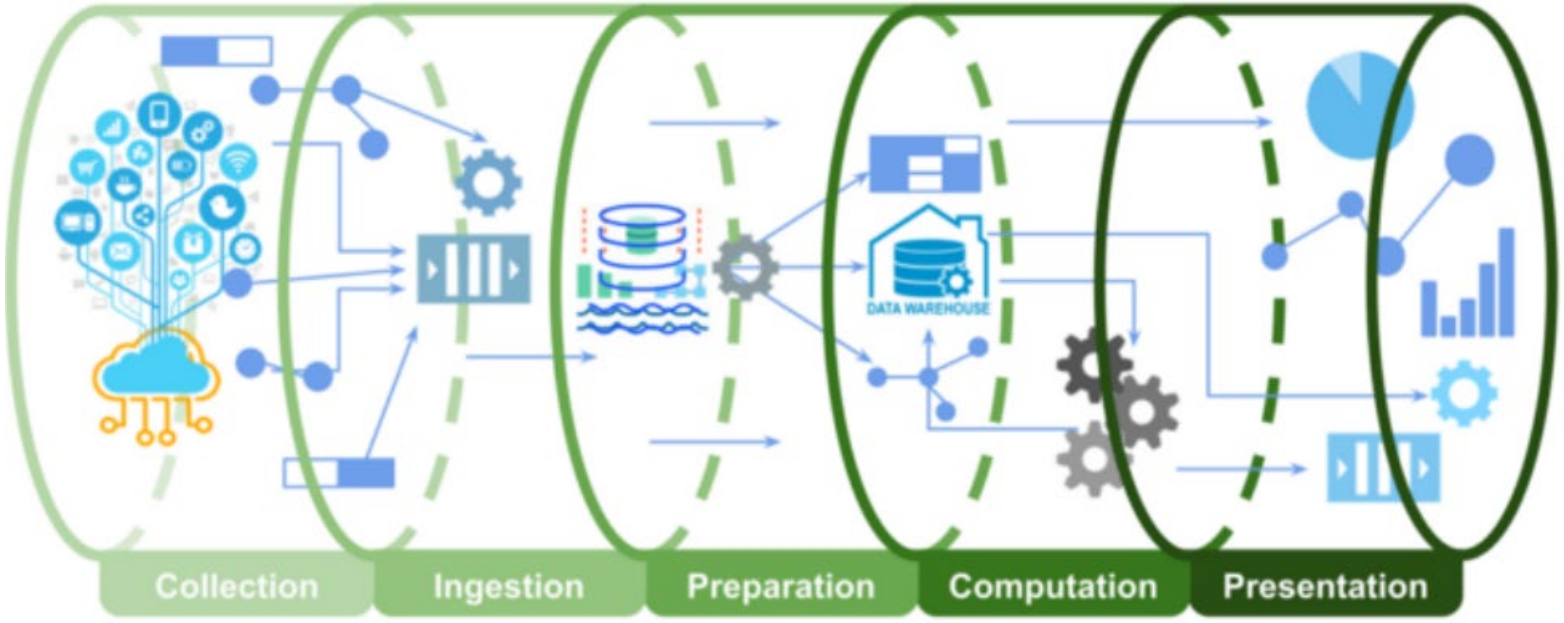


Constraints, Assumptions, Considerations

- Short timeline 

- Data is accessible, sufficient to make predictions

Figure 5



From “Architecture for High-Throughput Low-Latency Big Data Pipeline on Cloud,” by S. C. Gupta, 2020, *Towards Data Science*. Copyright 2022 by Medium.

Constraints, Assumptions, Considerations (Cont'd)

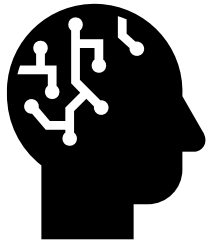
- Value-add to 3 core customer bases
  - Summary stats provide insights
  - Predictive models prove consistently reliable

Constraints, Assumptions, Considerations (Cont'd)

- Focus on ethically aligned design (EAD)
  - Biases can be identified and addressed
  - High emphasis on ethical considerations
  - Meaningfulness, accountability, responsibility, transparency

(Vakkuri & Kemell 2019)

Project Solutions & Advantages



- Seamless service expansion to existing edtech effectiveness system (EES)
- Descriptive details of the data
- Predictive modeling to enable “leaps” in understanding

Return on Investment (ROI) Opportunities

- Increasing digital learning in public sphere
- More value-add services that will:
  - Strengthen current customer relationships
  - Potentially increase customer base

Next Steps

Continue Processing Data

Develop & Deploy

Build & Evaluate Models

Transfer Model Frameworks to Engineers

Conclusion

Expected benefits:

1. Early implementation of analytics functionalities to existing EES
2. Predictive models address digital learning access and engagement issues
3. Reduction of online engagement gaps
4. Strengthening relationships with customers

References

Business Wire. (n.d.). *E-learning market in the US to grow by $ 21.64 billion during 2020-2024 | Evolved learning and education landscape to boost growth | Technavio*. https://www.businesswire.com/news/home/20210204006191/en/E-Learning-Market-in-the-US-to-Grow-by-21.64-Billion-During-2020-2024-Evolved-Learning-and-Education-Landscape-to-Boost-Growth-Technavio

Census Bureau (2020, August 26). *Schooling during the COVID-19 pandemic*. U.S. Department of Commerce. https://www.census.gov/library/stories/2020/08/schooling-during-the-covid-19-pandemic.html

Collis, V., & Vegas, E. (2020, June 22). Unequally disconnected: Access to online learning in the US. *Education Plus Development*. https://www.brookings.edu/blog/education-plus-development/2020/06/22/unequally-disconnected-access-to-online-learning-in-the-us/

Gupta, S. C. (2020, March 3). *Architecture for high-throughput low-latency big data pipeline on cloud*. Towards Data Science. https://towardsdatascience.com/scalable-efficient-big-data-analytics-machine-learning-pipeline-architecture-on-cloud-4d59efc092b5

NCES. (n.d.). *Back-to-school statistics*. US Department of Education and the Institute of Education Sciences, National Center for Education Statistics. https://nces.ed.gov/fastfacts/display.asp?id=372

Vakkuri, V., & Kemell, K.-K. (2019). Implementing AI ethics in practice: An empirical evaluation of the RESOLVEDD strategy. In S. Hyrynsalmi, M. Suoranta, A. Nguyen-Duc, P. Tyrväinen, & P. Abrahamsson (Eds.), *Software Business* (Vol. 370, pp. 260–275). Springer International Publishing.

Thank you!

CarR^2 Contact info: Aaron Carr, acarr@sandiego.edu