



05/18/2026 REVISE Webinar

Mathematizing, Visualizing & Power

Appalachian Youth Becoming Data Artists for
Community Learning

Lynn L Hodge
University of
Tennessee,
Knoxville

Yilang Zhao
University at
Buffalo, SUNY

Ethan Pignataro
Gibbs High School





What is MVP ?

MVP is a 3-year NSF funded AISL project .

The core idea of this program is to encourage middle and high schoolers to deep dive into their communities, learn about perceived crucial issues in their communities, collect relevant data from their communities, and ultimately communicate those issues with artistic data visualizations to their community members.



Why connect data & art?

The main purpose is to improve the accessibility of data science learning. Traditional data science education often involves coding and digital data visual generation, which establishes learning and application barriers. Connecting data and art allows personalized expression, interpretation, and communication of data and hence makes learning data science more accessible to students from marginalized groups and/or rural Appalachian areas.

THE MVP MODEL



MVP Program Implementation

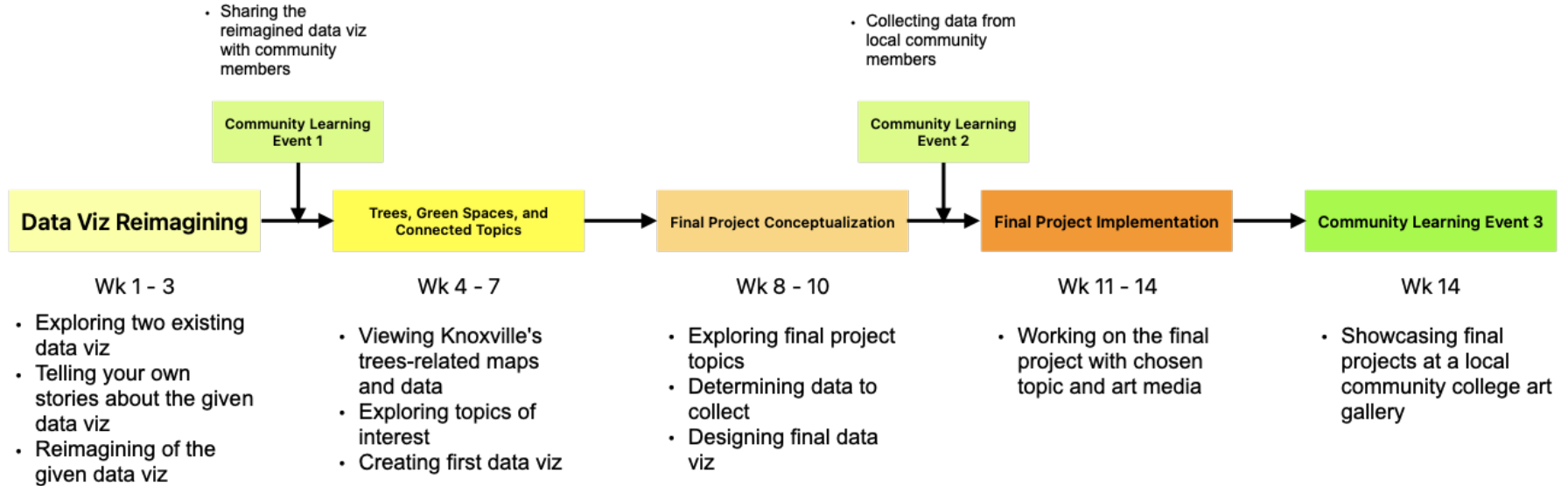


How did it work?

The MVP program was an afterschool program and had five cycles (iterations). Each cycle lasted between 13 – 14 weeks, with a 90-minute learning session per week.

For cycles 1 (spring 23) and 2 (fall 23), we hosted the MVP program at an afterschool program in downtown Knoxville, TN, each cycle having around 25 participants. For cycle 3 (spring 24), we hosted students at both an afterschool program and a rural high school in Knox County for a total of more than 40 participants. For cycle 4 (summer 24), we hosted students at an urban social service building in downtown Knoxville, with 8 high school participants. For cycle 5 (Spring 25), we hosted approximately 10 students at a rural K-12 school and a rural community center.

MVP Learning Sessions





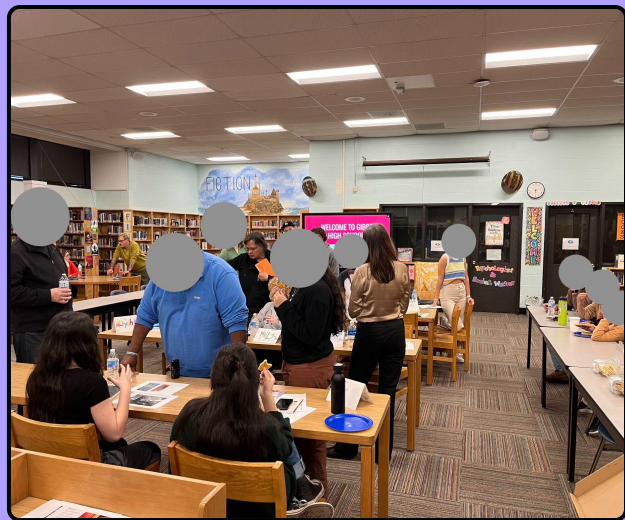
What is a CLE?

CLEs, or Community Learning Events, were a key component of the MVP program. CLEs usually took place somewhere that is different from where the regular MVP sessions happened. There were 3 or 4 CLEs in an MVP cycle.

In each cycle, except for the last CLE, each CLEs provided a space for our participants to communicate their in-progress work to and/or collect data from their community members. Community members included peers, teachers, parents, business owners, etc.

The last CLE served as a grand showcase for our participants to describe their final data art projects, findings, and reflections to community members. CLEs were open to the public.

CLEs & Learning Sessions



MVP Research Strands

Data Science and Arts Learning

Example RQs:

How do students establish connections between data and art practices within a data-art inquiry program?

How do students establish personal relevance with data in a data-art inquiry program?

Community-centered learning

Example RQs:

How are relationships created and sustained with community members before, during, and after CLEs?

What design processes of MVP are used to create and/or modify entry points for future CLEs?

Design

Example RQs:

What design considerations are raised in designing data visualization activities that integrate multi-disciplinary, critical, and community-centered approaches?

What tensions are present in this design process, and how do those tensions relate to the integration of the approaches?

Data Visualizations & Artist Statements





Data Artist: Jin

Artwork Title: **With doubt there is hope**

Medium: **Acrylic Paint and plaster strips**

Artist's Statement: **This piece is from 2 points of data on my survey one, the decline in work ethics in younger generation and two, the want for younger generation in government. The piece is meant to be symbolic, so that even if there are negative connotations placed on a certain age group, they are the future and needs to be kindred for that sense of change for the better or worse.**



Data Artist: Morgan

Artwork Title: Greed's Dream

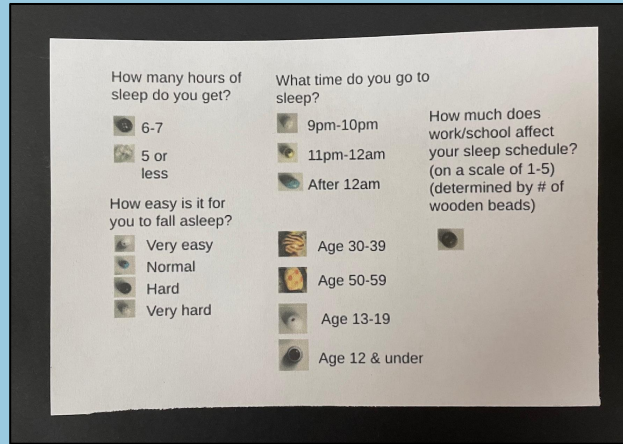
Medium: Mixed Media: Felt, Beads, Cardboard, etc.

Artist's Statement:

My artwork is a reflection of the data I've collected throughout the entirety of MVP. Overconsumption is a large problem in corporate America; here we exploit other countries, overpopulate the planet with pollution, and destroy the economy. My piece discusses the consequences of the influence of social media to constantly purchase items for cheap. All age groups are easily influenced; however, teenagers are the primary target for overconsumption, and because of the easy access to online shops like Temu, TikTok, Depop, and more, individuals have easy access to purchase anything at the tap of a button. Furthermore, the intensely low prices, expedited shipping, and influencers constantly advertising products easily catch the eyes of viewers, especially the younger audience.

The mountains in the background represent the different age groups that are active on the internet everyday. The lake represents how easily each individual is influenced (Left: not easily/ Right: easily influenced). The notification bubbles represent how often each individual purchases from an online source, the purple being never.

What do we not have that makes us so hungry?



Data Artist: Dakota

Artwork Title: Losing Sleep

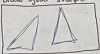
Medium: Embroidery hoop, suede leather lace, hemp cord, and beads.

Artist's Statement:



My piece is about sleep schedules and the impact school/work has on them. My findings both affirmed my guesses and proved me wrong to an extent. Going into the data collection, I thought adults' sleep schedules would be less affected by work/school than teenagers; While this was true, adults displayed results that prove work/school to affect them nearly just as much. My general takeaway from the data is the idea that work/school affects all age groups almost equally. This leads me to believe that the problem stems from people in power, rather than individuals. My data is visualized in a dream catcher to represent hopes for peaceful nights of sleep. The beads display the data with each bead type representing a different answer choice from my survey. Each string is a person who took the survey. Not all of the data is shown on the dream catcher.






1) What color do you see when you hear "teacher salary"?
 • Black

2) What shape do you see when you hear "gun violence"?
 Draw your shape
 • Triangle :or: 

3) What color and shape do you see when you hear "low income" and "high income"?
 • Brown (low) • Red (high)


 

4) What three colors do you see when you hear "school threats"?
 • Purple • Dark Red • Blue



5) What are three shapes you see when you hear "underfunded schools"?
  






1) What color do you see when you hear "teacher salary"?
 • Blue

2) What shape do you see when you hear "gun violence"?
 Draw your shape
 • Circle :or: 


3) What color and shape do you see when you hear "low income" and "high income"?
 • Orange (low) • Purple (high)



4) What three colors do you see when you hear "school threats"?
 • Red • Yellow • Blue

5) What are three shapes you see when you hear "underfunded schools"?
  




1) What color do you see when you hear "teacher salary"?
 • Dark Purple

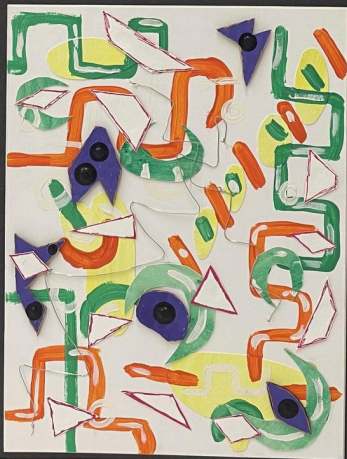
2) What shape do you see when you hear "gun violence"?
 Draw your shape
 • _____ :or: 

3) What color and shape do you see when you hear "low income" and "high income"?
 • Yellow (low) • Green (high)

4) What three colors do you see when you hear "school threats"?
 • Orange • White • Green

5) What are three shapes you see when you hear "underfunded schools"?
  



Data Artist: Harper

Artwork Title: Untitled

Medium: Acrylic, watercolor, cardboard, wire, mat board

Artist's Statement: The three pieces I did were made to represent three different people from our school. I made a survey and asked them to think abstractly about certain topics that they normally wouldn't. Such as teacher pay, family incomes, and school threats. I wanted to make a piece that didn't just look like a graph or an article. I wanted to be able to make these people see these issues as art mediums.



Data Artist: Sydney

Artwork Title: Cause and Effect of Global Warming

Medium: Ceramics

Artist's Statement: The data I collected was a lot about global warming which showed how much it affects the environment. I showed my data in my work by doing a cause and effect with two pieces. The first one is the cause of global warming in Alaska which is because of oil rigs and pipelines. In my piece I showed what they are and how most everyone seems to think they are doing more good. However, my second piece shows the effect which is how it does more harm to the environment such as harming animals, climate change, as well as air pollution.



Data Artist: Gwen

Artwork Title: The Faces of Mental Health

Medium: Plaster and paint

Artist's Statement: These faces were created to represent the different generations' views on mental health. There is a face for Baby Boomers, Gen. X, Millennials, and Gen. Z. I decided to focus on mental health because I want to become a therapist. The reason that I decided to use masks is because I wanted to show how the generations thought of mental health with makeup.



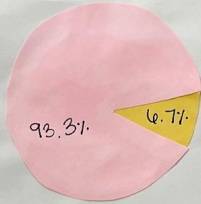
Data Artist: Tiana _____

Artwork Title: ___Where Do the Cows Go? _____

Medium: ___Alcohol based markers and pens _____

Artist's Statement: My artwork was based around my data about increasing population in the community. Since people are moving to Corryton/Knoxville rapidly, more neighborhoods are being built. These houses are built quickly creating urban sprawl. The increasing population causes many problems and affects everyone. My art shows a side by side of what is happening in our community.

TRY OUR NEW FLAVORS



93.3% said people should be more concerned about the future consequences vaping has on the youth. 6.7% said they were unsure.

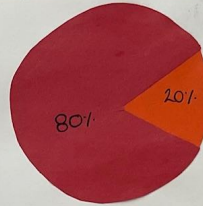
Top Responses:

1. Reasons students start vaping:

- It's a rising trend
- To fit in
- Peer pressure
- Stress/anxiety relief

3. How to exploit vaping as a negative act:

- Students should do community service at a hospital or nursing home for people suffering from vape/smoking side effects.
- Less appealing flavors
- Monthly videos to show dangers



80% said most teens don't truly understand what vaping does to their body. 20% said yes, but they don't seem to care.

2. Ways to prevent access to nicotine:

- Stricter school policies
- Sold in less stores
- More programs to discuss the negative effects.



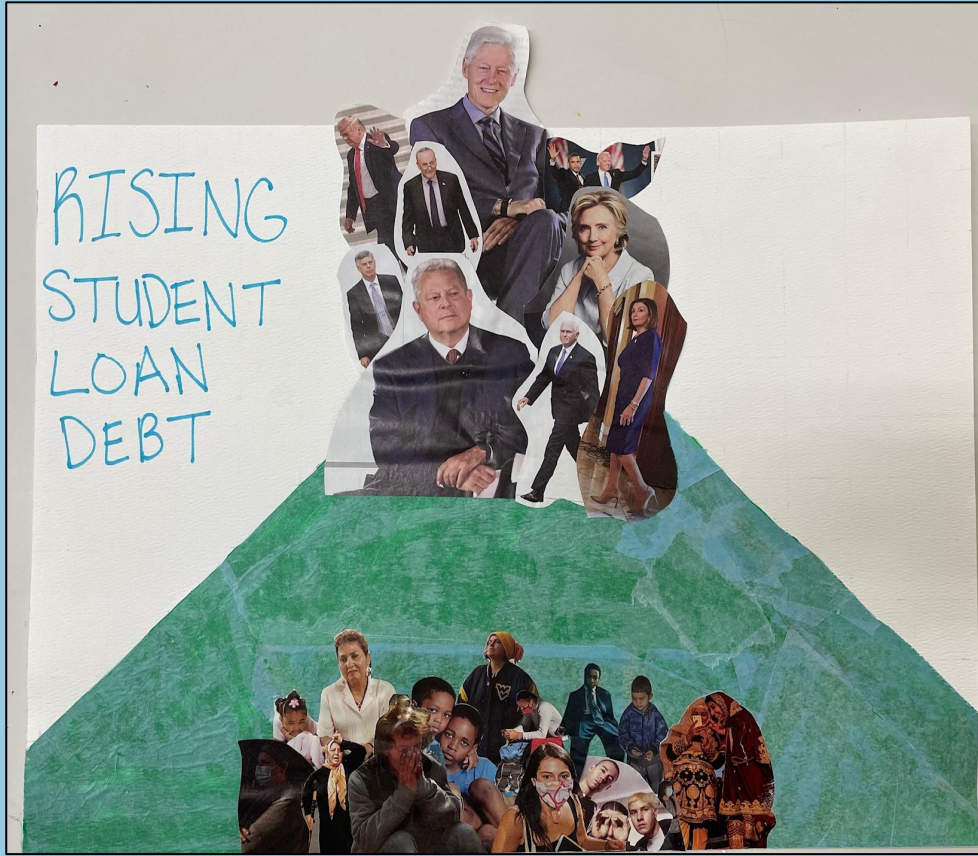
Emma

Data Artist:

Artwork Title: How vaping affects teens

Medium: I used markers to create an advertisement for bad vape flavors. I did this to show a way of exploiting vapes as something gross rather than pleasing. I then drew charts to present the data I collected about the issue.

Artist's Statement: I've noticed vaping has become much more popular among the youth. It has become much easier for teens to gain access to vapes, therefore making it easier for them to become addicted. I wanted to use this opportunity to show people's opinions on the matter with the data I collected and to display a piece that views vaping as a negative act. In doing so, I've noticed that vaping is looked at as flavorful and interesting with pleasurable flavors and seen as disgusting with gross flavors. That being so, I believe it's the flavors that draw people in and make it interesting. I drew an advertisement of gross vape flavors to get my point across.



Data Artist: Layla

Artwork Title: Student Loan Debt

Medium: Collage, Paint, and Markers

Artist's Statement: I decided to do my project based off of the rising student loan debt. From the data I gathered, I found that most people were concerned about the rising student loan debt in America. Because of this, I decided to lay my project out like a pyramid with the top being politicians who represent the lack of action when it comes to the issues and the bottom of the pyramid being "normal people" who are suffering because of the lack of action. With them being at the bottom, it portrays that they may never be able to get out of that debt and how they are bearing that weight while politicians at the top, who are unaffected by it, aren't doing anything about it.



Data Artist:

Jenna

Artwork Title:

Ignorance is Bliss

Medium:

Acrylic Paint

Artist's Statement:

Originally, I collected data on the homeless population of Knoxville and the community's opinion on what action they believe should be taken to provide them with shelter. I received varied results on what should happen to improve the conditions that they are living in daily. I wanted my piece to represent how a lot of extremely privileged people often ignore the destruction occurring around them if it doesn't directly affect their lives. The shopping cart and other objects displayed in the house's front yard is a representation of the homeless and how their quality of life and their story is often misunderstood from the eye of the public.



Many people believe fast food is unhealthy for you. However is that the truth?

Delicious

NO!

PIZZA!

FOOD FOR THOUGHT

super fast suppers are easy enough for nights when you don't feel like pulling out a pan

WHAT HEALTHY MEANS NOW
 ONE-HOUR RESTRICTION GUIDELINES
 20-MINUTE MEALS

GO GREENS
 CONVENIENCE We know that our producers are busy—with jobs, families, sports, and community activities—so there are always options that are both quick and easy. While we do not use any processed foods, we do rely on time-saving ingredients and simple cooking methods.
 EXPECTATIONS VS REALITY
 SEVERAL TIMES A DAY
 LOOSELY
 10 11 12 1 2 3 4 5 6 7 8 9
 30 MINUTES

Data Artist: Priya

Artwork Title: The Expense

Medium: Markers, Pens, Magazines

Artist's Statement:
 My work explores the cost in healthy vs unhealthy foods by a collage. There's many vibrant colors and I used a red and green theme, I wanted to show the differences between both categories.

I used red to represent the many fast food logos that have the color red. Red is a color known to be eye-catching and appeals to appetite. From collecting this data, I learned that fast food or stereotypical unhealthy foods can actually be good for your system. In the East Tennessee area, most families had at least 5 people in their household, and mouths need to be fed. I used green to represent the stereotypical healthy foods of always having to be green. Green is known to be healthy within this culture. From collecting this data, I learned that convenience and time is often a struggle. Several times in my life, I have tried following cookbook recipes that end up taking hours when the expected time would be like 30 minutes.

There is definitely a line in between both categories, and that there can be a balance. Prioritizing health is important, but there is also value in embracing moments of joy and convenience other types of foods may bring.



Data Artist: Rami

Artwork Title: Stand Out Features of the Road

Medium: Photography

Artist's Statement:

I created this artwork in response to data collected from a survey about road safety. I wanted to highlight different features of the road used for protection and safety



Data Artist: Avery

Artwork Title: Reflection on the Issue of Guns in American Schools

Medium: Illustration Marker and Pen

Artist's Statement: After gathering data based on a variety of questions, I decided to reflect on the answers in a more "comedic" direction. With such a serious topic - the argument of teachers being allowed to carry a gun in class - I wanted to present it in a way that is less violent. I created a political cartoon that simply reflects the close-minded bias of the issue mentioned above.



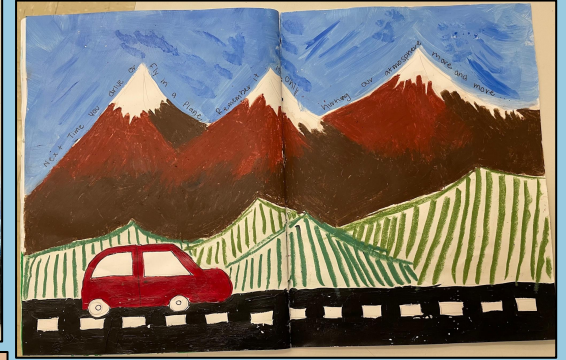
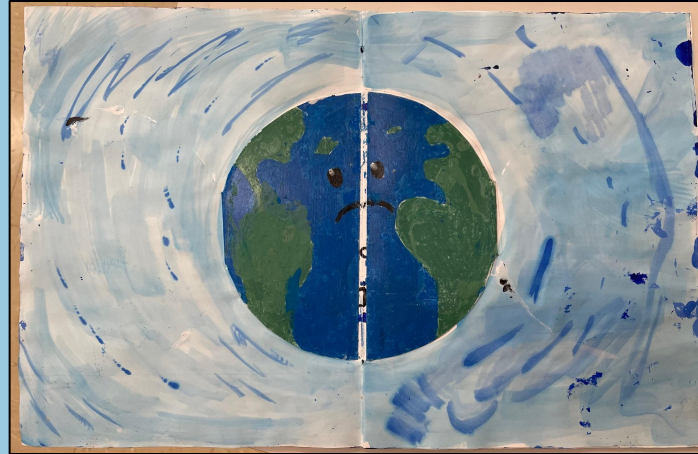
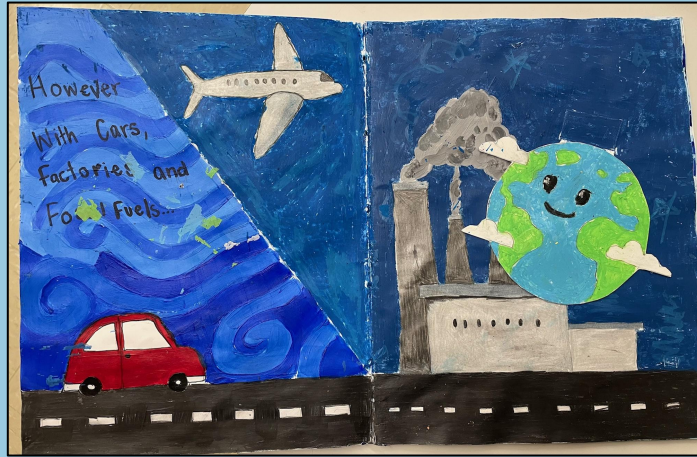
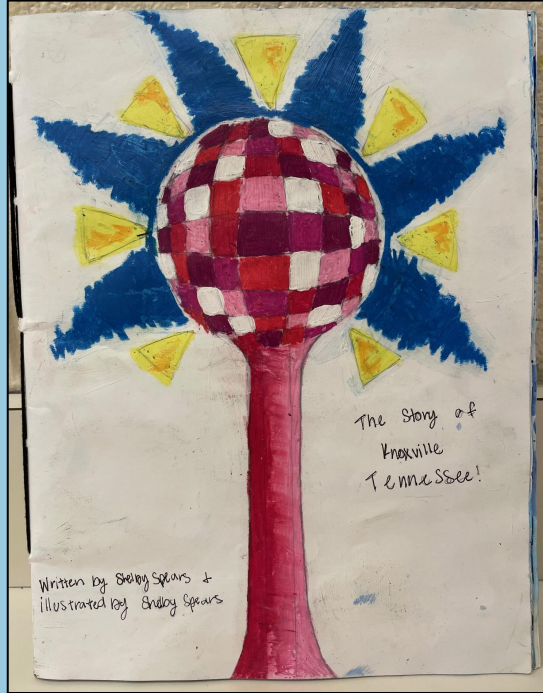
Data Artist: Pamela

Artwork Title: Social media + trust in government

Medium: Magazines, acrylic paint, paper, and sharpies

Artist's Statement:

My artwork is about social media and its relation to how people view government and politics. In my survey, I found that those who had spent a lot more time on their phones and on social media, had more pessimistic answers to how they view current day politics and often answered that they had no trust in both local and national government. My artwork was trying to reflect the overwhelming feeling that social media can give people about politics. Social media constantly bombards people with alarming news and information, that no matter what side of the political spectrum you are on, can make you feel helpless. I tried to draw a kind of evil looking uncle sam to kind of show off how all of that constant bad news can make people start to have a more skewed view of government. I do want to clarify that the news articles I picked out weren't really meant to have message, other than just being A LOT of different information all at once, as a sort of way to emulate how social media can make people feel nowadays



Data Artist: Sofia

Artwork Title: The pollution of Knoxville

Medium: acrylic paint, oil pastels, and colored pencils.

Artist's Statement: My artwork is a children's pop-up book. I wanted all people of all ages to be able to read and understand it and even though it is such a heavy topic. The topic I chose was air pollution and the air quality of Knoxville TN, specifically. From the data I collected many of the residents of Knoxville, TN agree that the air quality has been severely affected by climate change and the pollution of greenhouse gases. I wanted my piece to be fun and interactive so it's not just something to look at but gets my audience's attention and for them to really understand the idea I was trying to get across. Which, was that the earth is exhausted. It is deteriorating right in front of our eyes. If we don't switch over to safer more renewable sources for our energy it will lead to our own demise. Knoxville is beautiful, let's take care of it!!!

What Next?

1. Amplify the voice from the community
2. Explore the integration of digital data tools, such as CODAP
3. Bring MVP to other regions to provide accessible, interdisciplinary data science education



For more information, please visit the MVP website mvp-project.com

To learn more about MVP research, please use this link: tinyurl.com/mvppub