

# Success Through Technology Education

## Executive Summary

### Community Partner

Leonel Romero, Joseph Sapien, Timothy Murphy, Jesus Hernandez

### Student Consulting Team

Luye Zhou

Isaac Ahn

Cheng Ma

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## Background

The Success Through Technology Education (STTE) Foundation is a nonprofit organization based in the Borderplex region. Their vision is to support efforts that develop, deploy, and advance programs and initiatives focused on harvesting entrepreneurship ecosystems, STEAM, and technology comprehension. STTE's current efforts are focused on efforts that help prepare the next generation for future opportunities and global challenges the economy will face.

## Project Description

### Project Opportunity

There are three main pain points STTE is facing. Firstly, STTE wants to improve their delivery of climate change related education material to K-12 students. They believe they don't have a product that delivers climate change related educational content in a sufficiently engaging and interactive manner. Secondly, the El Paso Children's Museum, a partner of STTE, has been experiencing lower than desired traffic due to the pandemic. Thirdly, STTE needs a potential new revenue stream as they want to improve the delivery of their programs and sustain their operations for the future.

### Project Vision

Our project vision is to collaborate with STTE in the development of a gamified, climate change related museum exhibit for the El Paso Children's museum. The solution will involve users creating a climate change themed crossword puzzle and also scanning other users' puzzle to learn about climate change related terminology. The project should address the three main pain points of STTE by improving the educational impact of climate change education, improving the traffic to the El Paso Children's museum, and laying the foundation for an exhibit STTE can install at other museums around the nation.

## Project Outcomes

### Process

Our program provides a gamified, interactive experience for users to learn about climate change. Users use their phone cameras to take a picture of a crossword-like 10 x 10 grid, then our program scans the picture, identifies the hidden words, and pulls up web pages with relevant content containing a title, a paragraph explaining the concept, an image of the concept, and a YouTube video, for each word recognized.

### People

K-12 children will be able to use our program to not only learn more about global climate change but also have an enjoyable time doing so. STTE will also be able to use our program as a demonstration for an exhibit that provides a gamified and interactive way to learn about climate change. STTE has also identified Timothy McCray and Jesus Hernandez as key software developers to oversee the solution and its future. Finally, the El Paso Children's Museum will have the opportunity to install an exhibit that promotes climate change related education in a gamified and interactive manner.

## Technology

Our technology outcome is an OCR text detection system for a physical crossword puzzle that allows middle school students to learn more about climate change at El Paso children's museum. The system will automatically detect valid climate change related terms in the crossword puzzle, and it will generate a webpage displaying relevant information about the terms.

## Project Deliverables

The main deliverable is a Python program consists of three core functionalities: the ability to capture and save an image from a mobile device, recognize and extract text in the image, and create local and public webpages in response to the extracted text. We have also compiled an extensive collection of climate change related terminology.

## Recommendations

There are two main recommendations:

1. Package the functionality of our Python program into one mobile application. Doing so will enable users to independently scan a user generated crossword puzzle and learn about the terminology embedded in the crossword.
2. Incorporate AR elements into the climate change related exhibit:
  - a. The leaderboard that displays the best user generated crosswords could have AR effects that, for example, display AR scenes that represent terms in a crossword.
  - b. Words, when detected in a crossword, could trigger AR effects, such as the word jumping out towards the audience.
  - c. An interactive smart city AR scene at the museum that embodies concepts related to sustainable development and climate change.

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## Student Consulting Team

**Isaac Ahn** served as project manager. He is a junior majoring in Information Systems with a minor in HCI. He is interested in UI/UX and AR technologies.

**Cheng Ma** served as quality assurance manager. He is a junior majoring in Information Systems with an additional major in CS. He is particularly passionate about the applications of technology in the field of healthcare. He will be interning at Apple this summer.

**Luye Zhou** served as the lead developer and was responsible for client relationship management. She is a junior majoring IS with a double major in CS. She is interested in software engineering and startups. She will be interning at Apple this summer.