I. Candidate Information

First Name: Josh
Last Name: Weiss

II. Capstone track selection and tentative title

Track: web development
Tentative title: Translating Student Behavior into Instructional Strategies

III. Design Questions, Technology, References, and Schedule

What are the context, need, significance, and estimated number of users of your proposed project?

The majority of teachers are not adequately equipped with a range of strategies to deal with the broad spectrum of cognitive, emotional, and social needs of their students. Commonly, this wisdom is accrued over years of trial-and-error, or with the transferal of knowledge by a master teacher. Absent these two factors, instructors should not be expected to have an adequate grasp of strategies.

This scope of this problem is enormous. In the US alone, 75 million students are affected by the quality of interventions performed by their instructors. Over the course of my capstone, I propose to address the needs of 500 students through 5 teacher-partners. I hope to expand this scope as my project develops beyond the capstone timeline.

What is the proposed solution, novel product, or piece of art for your capstone project?

I will create an app, "Aionno: The Student-Teacher Translator." The app will act as a "match-maker" service between student needs and teacher action. For each combination of factors – verbal behavior, physical behavior, and content – a probability table list the likeliest reasons for student distress. After identifying the most likely root cause, the app will then provide a menu of strategies according to the latest research. These strategies could draw from learning science, cognitive psychology, and other areas related to behavior and achievement.

What are the expected measurable outcomes, audience size, or quantifiable behavior change?

The audience size will be 5 teacher-partners and the 500 students they collectively teach. The outcome will qualitative feedback from instructors regarding confidence levels in searching out and employing new strategies.

What are the different technologies that you will use and why are they needed for completing the project?

Technology #1: Node.js
Reason: Generate a dynamic app interface

Technology #2: Express.js
Reason: Control flow of data in and out of app

Technology #3: Sass
Reason: Create modular, legible, and efficient code for a robust interface design that will evolve over time

References to four comparable pieces of work (e.g. publication, piece of art) in APA style if appropriate.

Reference #1:

Pressley, M. (1990). Cognitive strategy instruction that really improves children's academic performance. Cambridge, MA, US: Brookline Books.

Link: https://psycnet.apa.org/record/1990-98396-000

Reference #2:

Child Development Institute. (2019). *ADHD Students Learn Differently. Try These ADD Classroom Strategies*. [online] Available at: https://childdevelopmentinfo.com/learning/learning_disabilities/teacher/ [Accessed 16 May 2019].

Reference #3:

Oecd.org. (2019). *Creating Effective Teaching and Learning Environments: First Results from TALIS - OECD*. [online] Available at:

http://www.oecd.org/education/school/creatingeffectiveteachingandlearningenvironments firstresultsfromtalis.htm [Accessed 16 May 2019].

Reference #4:

Durlak, J., Weissberg, R., Dymnicki, A., Taylor, R. and Schellinger, K. (2019). *The Impact of Enhancing Students' Social and Emotional Learning: A Meta-Analysis of School-Based Universal Interventions*.

Link: https://onlinelibrary.wiley.com/doi/abs/10.1111/j.1467-8624.2010.01564.x

Works cited: You need to begin a working bibliography as soon as the topic is approved. Eventually, this document will become your final bibliography, which will include all sources that you use during your research. It is helpful to use bibliographic software like RefWorks, EndNote, and others (a free research tools from the Harvard Libraries: library.harvard.edu, see Research Support, then Research Tools.

Tentative schedule with at least five milestone dates and one-line description of the deliverable.

Milestone #1: Complete user research
Date: September 10, 2019
Description: Ascertain the breadth of strategies (cognitive, social, emotional, etc.) that could be useful to instructors. Determine if input schema on app maps to how instructors conceptualize classroom behavior and intervention.

Milestone #2: Complete mid-fidelity mock-up
Date: September 20, 2019
Description: Create mid-fidelity, clickable mock-up (with software like inVision, Marvel, etc.) that concretizes structure of app

Milestone #3: Code app back-end
Date: October 20, 2019
Description: Develop server-side technologies to pass data and render pages

Milestone #4: Code app front-end
Date: November 20, 2019

Description: Develop client-side technologies to ensure app is responsive to mobile and is visually appealing

Milestone #5: QA/User testing
Date: December 1, 2019
Description: Test with alpha and beta groups to check for bugs. Perform user interviews.

IV. Project Description

Describe your project in two pages, including two or three visuals that you created on your own, e.g. graphs, diagrams, or sketches. Avoid copying images from other sources, unless you are comparing your own figure with a figure made by another author (clearly indicate the author's name and the source of the figure).

My project will be a web app that analyzes student behavior and provides instructors a "translation" of said behavior as well as strategies that apply to that interpretation. Upon entering the site, the user will see a title, a description, and instructions on how to use the dropdown menus (Diagram 1.1).

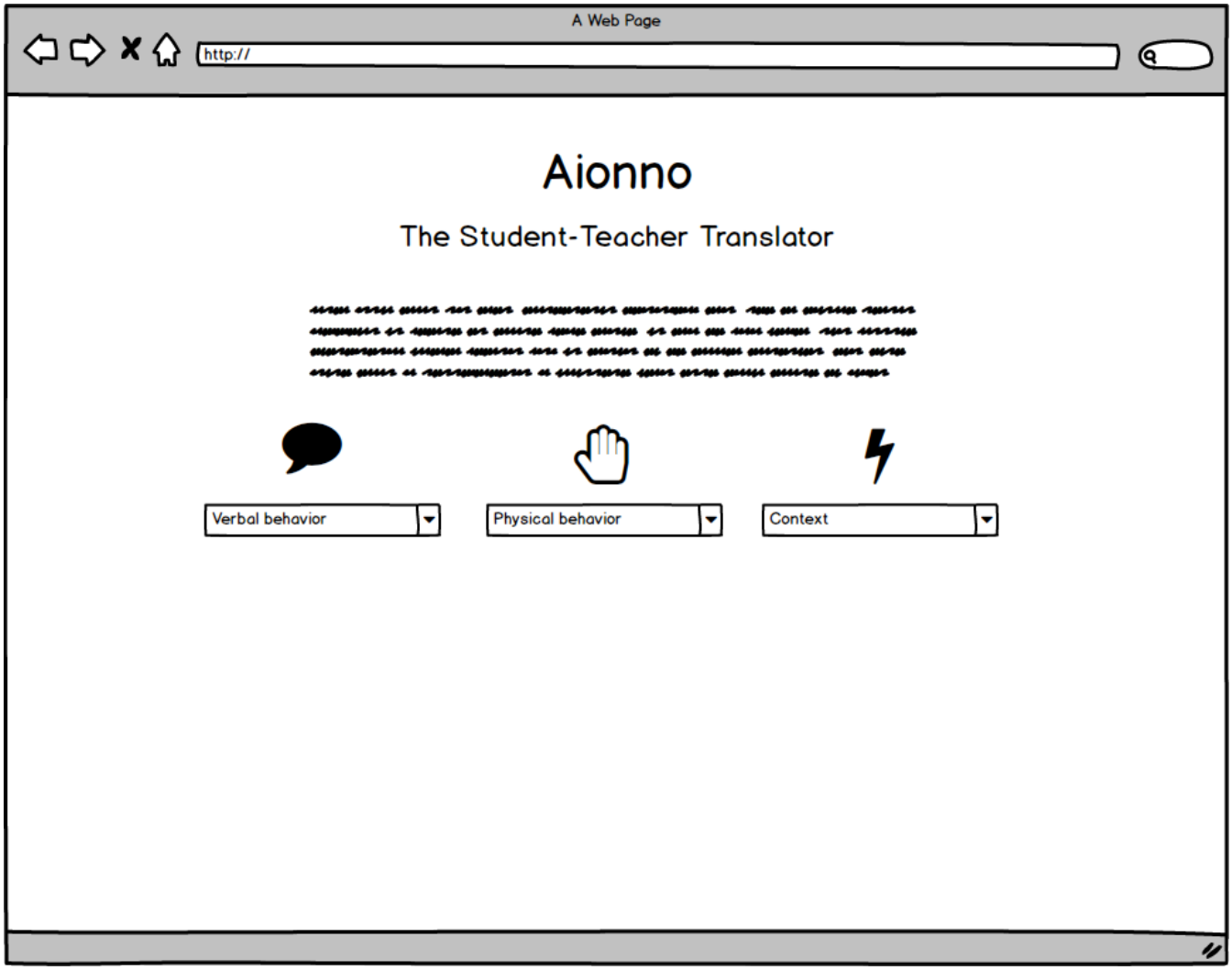

Diagram 1.1

Then, the user will select the dropdown options for “verbal behavior”, “physical behavior”, and “context” that best match their experience (Diagram 1.2)

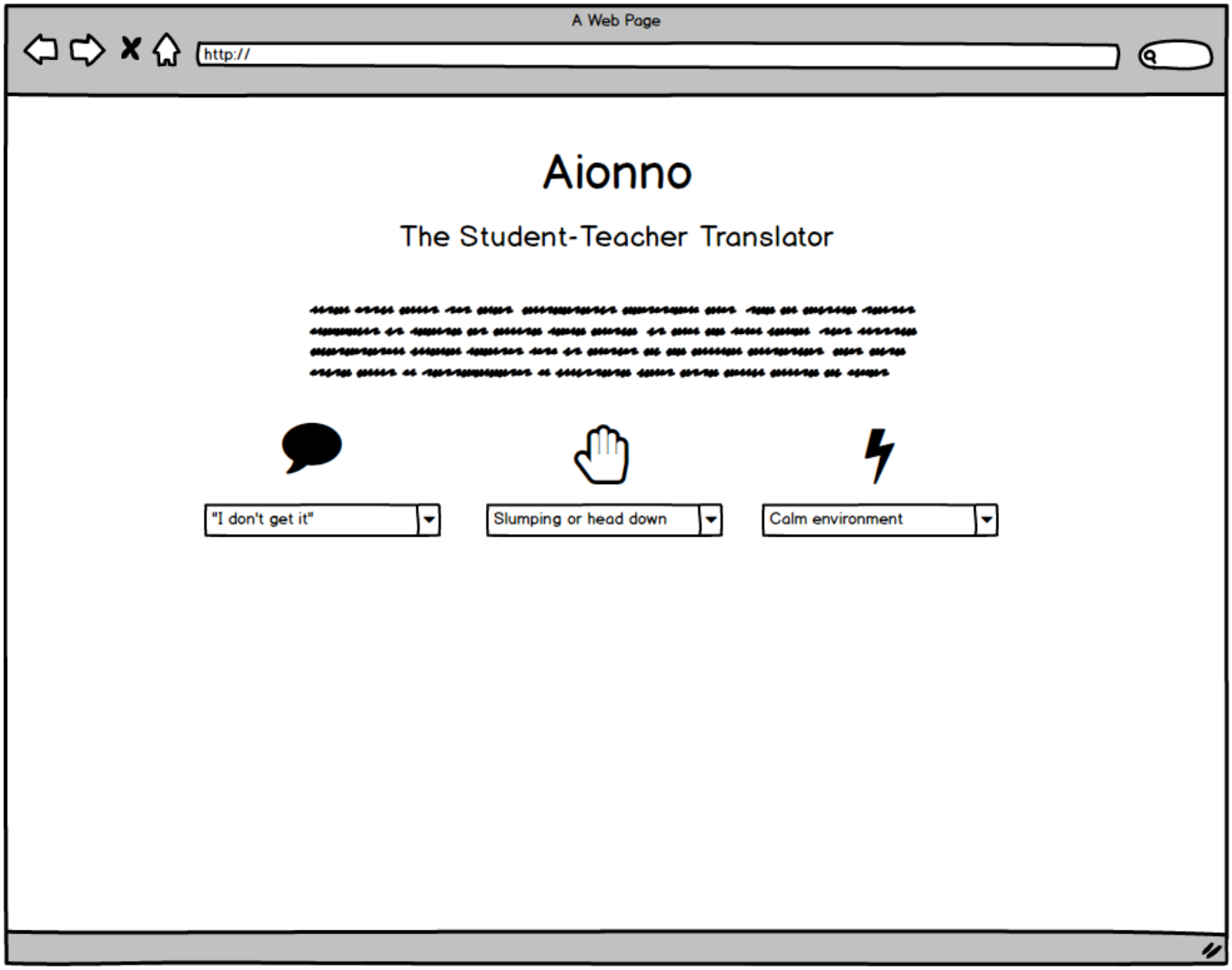

Diagram 1.2

After calibrating the dropdowns, the user will see several “translations” appear. The translations each list the most applicable strategies that could resolve the doubt or problem expressed by the student (Diagram 1.3). Each strategy card would consist of a summary and a link to an external resource page describing the strategy in more detail.

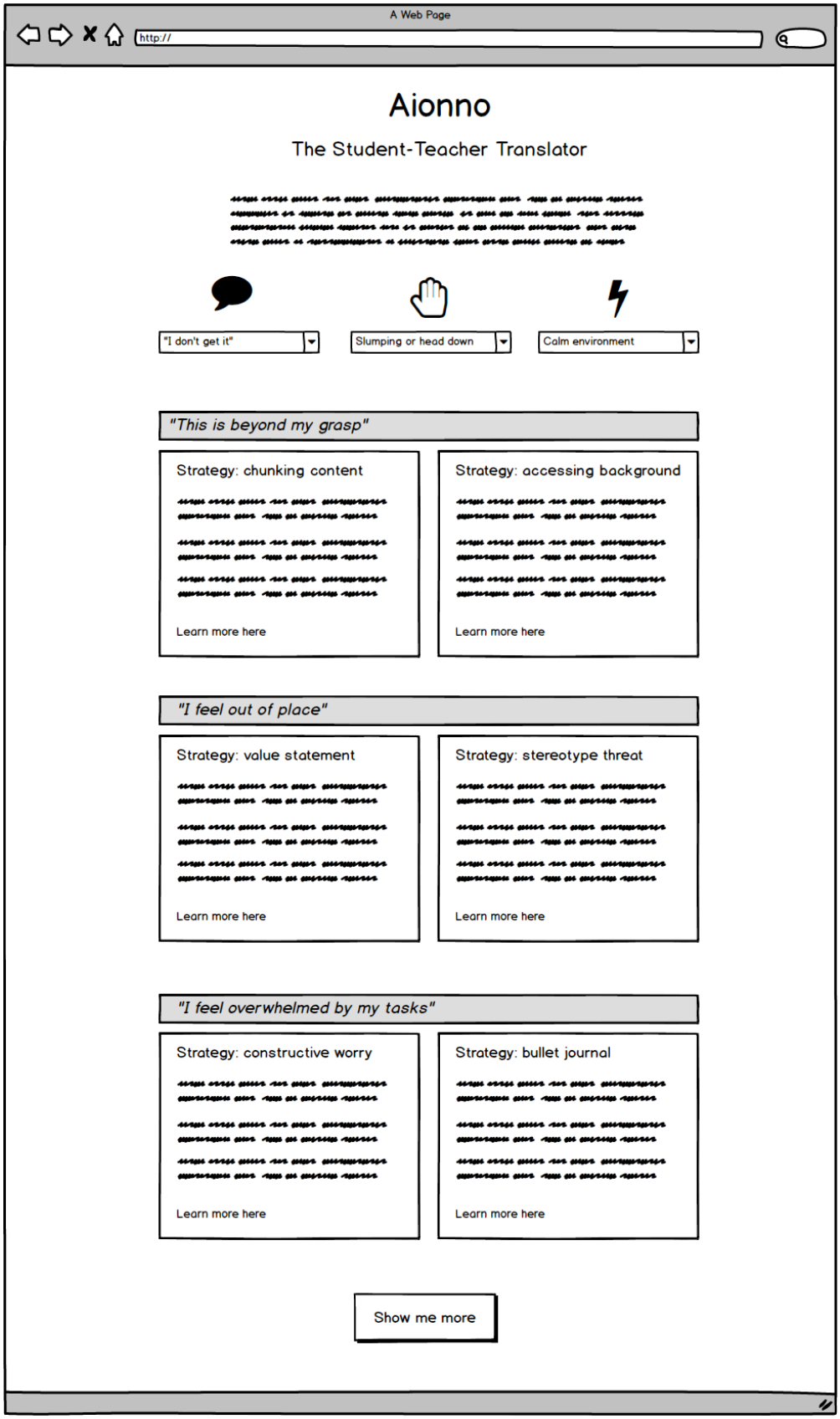
A Web Page
http://
Aionno
The Student-Teacher Translator
"I don't get it"
Slumping or head down
Calm environment
"This is beyond my grasp"
Strategy: chunking content
Learn more here
Strategy: accessing background
Learn more here
"I feel out of place"
Strategy: value statement
Learn more here
Strategy: stereotype threat
Learn more here
"I feel overwhelmed by my tasks"
Strategy: constructive worry
Learn more here
Strategy: bullet journal
Learn more here
Show me more

Diagram 1.3