DGMD E-598 Digital Media Design Capstone Tutorial

Final Proposal - Aionno
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1. Project Scope

1.1 Project Title

Aionno: The Student-Teacher Translator

1.2. Project Goal
What is the goal of your capstone project? Depending on your project, you might answer one of the following sub-questions: What need are you trying to address? What problem are you trying to solve? What message are you trying to convey?

I will create a web app, "Aionno: The Student-Teacher Translator." The app will act as a "match-maker" service between student needs and teacher action. A probability table will list the likeliest "translation" of actions and expressions based upon a combination of factors – verbal behavior, physical behavior, instructional context, etc. After diagnosing the situation, the app will then provide a menu of strategies that target the underlying distress or obstacle. These strategies could draw from learning science, cognitive psychology, sociology, and other areas related to behavior and achievement.

1.3. Learning Goals
What skills are you planning to develop during the completion of your project? What new approaches or technologies are you planning to learn?

I plan to develop my project management skills and technical skills. Project management-wise, I hope to improve my capacity to roadmap a multi-stage project that includes various stakeholders, deliverables, and potential points of iteration. Technically, I hope to improve my ability to design and execute an architecture that works well across devices and use cases.
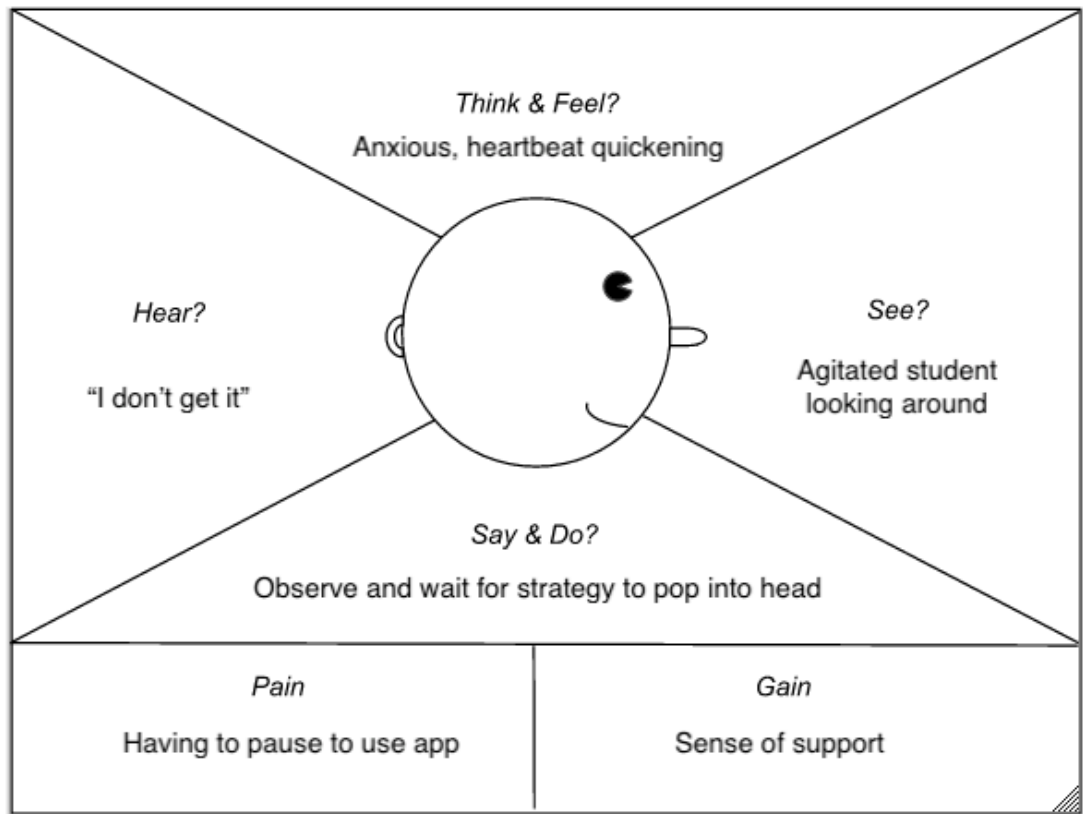
1.4. Target Audience
Who is the target audience? Describe the audience as thoroughly as possible, including demographics, technologies used to access the project, desires, frustrations, and goals. If you have personas, include them.
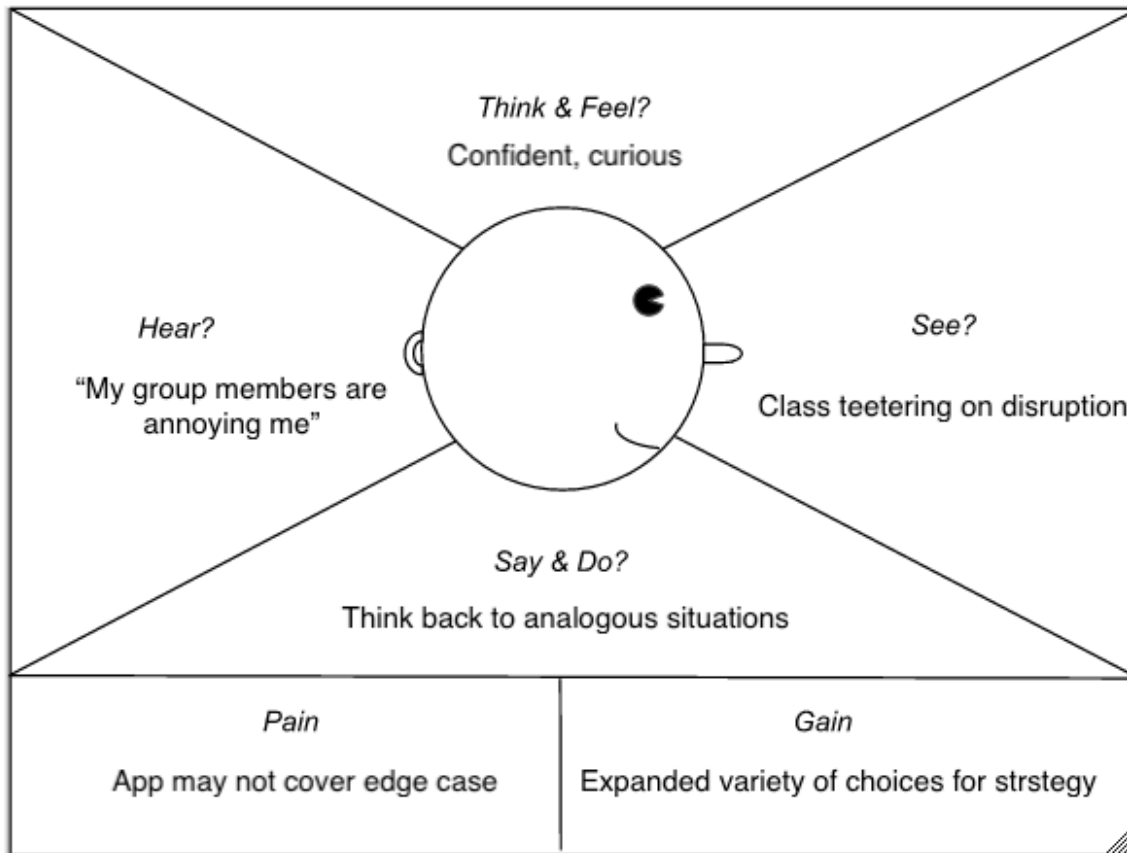
The target audience is beginning-to-mid career teachers who work with ages 11-16. This potential breadth of this audience is enormous. In the US alone, 75 million students are affected by the quality of interventions performed by their instructors.

Over the course of my capstone, I propose to address the needs of 500 students through 5 teacher-partners. The teacher-partners will be based in California and Colombia, and are beginning teachers ages 22-32. I hope to expand this scope as my project develops beyond the capstone timeline.
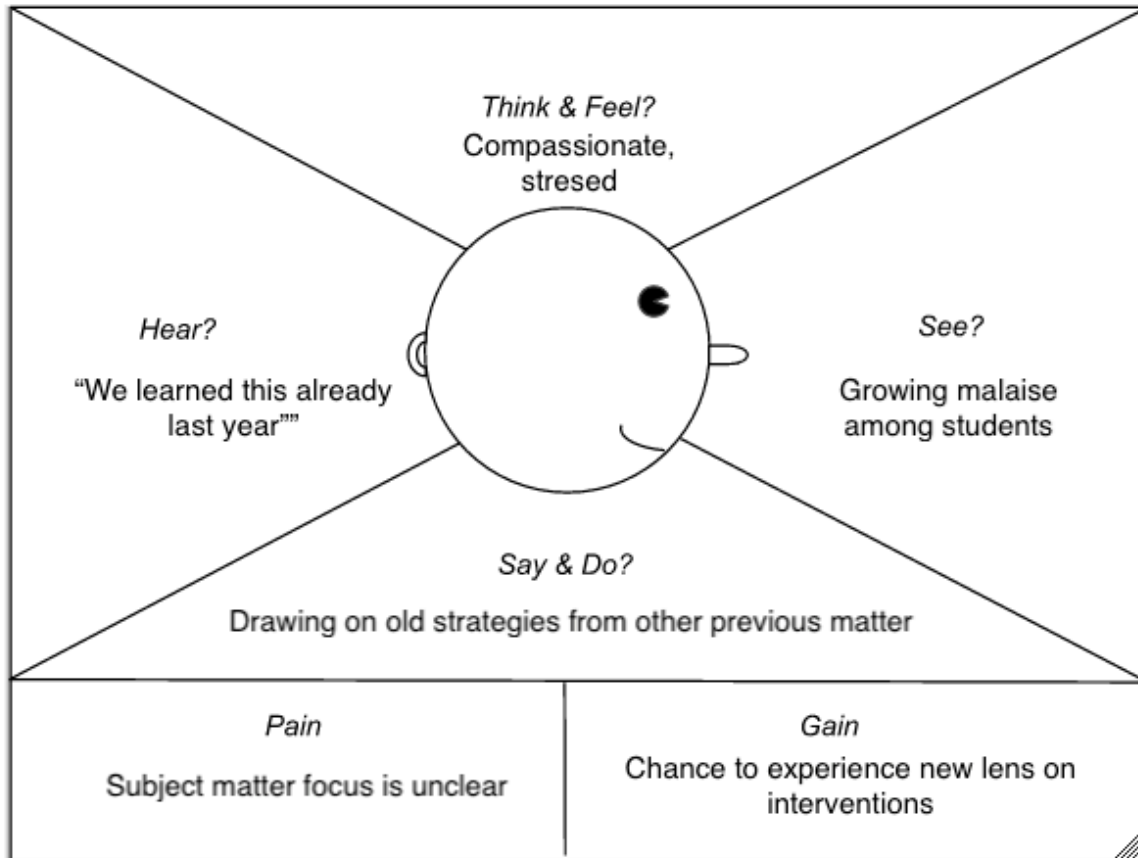
Persona 1: 1st year 8th grade English teacher in San Mateo, California, 23 years old, white female. Bachelor's degree, education major. Ambitious, compassionate, anxious. Has some strategies from undergraduate training but gets nervous about designing group work.

Think & Feel?
Anxious, heartbeat quickening

Hear?
"I don't get it"

See?
Agitated student looking around

Say & Do?
Observe and wait for strategy to pop into head

Pain	*Gain*
Having to pause to use app	Sense of support

Persona 2: 3rd year 9th grade history teacher in Bogota, Colombia. 26 years old, latino male. Bachelor's degree, non-education major. Busy, analytical, social. Uses same strategies most days and wants to expand repertoire.

Think & Feel?
Confident, curious

Hear?
"My group members are annoying me"

See?
Class teetering on disruption

Say & Do?
Think back to analogous situations

Pain	*Gain*
App may not cover edge case	Expanded variety of choices for strstegy

Persona 3: 5rd year 7th grade ESL teacher in San Francisco, California. 32 years old, Asian female. Bachelor's degree, Master's degree in Education. Considerate, tired, driven. Just changed subject area from science to ESL and wants to extend old strategies into new content area.

Think & Feel?
Compassionate, stresed

Hear?
"We learned this already last year""

See?
Growing malaise among students

Say & Do?
Drawing on old strategies from other previous matter

Pain
Subject matter focus is unclear

Gain
Chance to experience new lens on interventions

1.5. Elevator Pitch

How would you describe in 3 sentences the significance of your capstone project? What is the impact of your project compared to what already exists? The elevator pitch (or value proposition) should be brief, persuasive, and mention your goals and the skills you bring to the project.

Teacher have a hard time understanding what students need. Aionno helps instructors deconstruct what students mean, and then suggests strategies to address any concerns that the student has. Target problems and apply strategies like a master teacher would!

1.6. Metrics

How do you know your project is successful? Metrics should be SMART: specific, measurable, achievable, relevant, and time-bound.

Category	Approaches benchmark	Achieves benchmark	Exceeds benchmark
Interface design	Color and layout are accessible for most common devices; works on mobile, but not optimized (menu bar, type scaling, etc.); basic typography	Color and layout are accessible for most devices; works on mobile, but not optimized (menu bar, type scaling, etc.); functional typography	Color and layout are universally accessible for all devices; optimized for mobile; clean and inviting typography
Quality of code	Code is sometimes modular, not well commented, and infrequently demonstrates consideration for version control and hand-off	Code is often modular, well commented, and demonstrates consideration for version control and hand-off	Code is modular, descriptively commented, and demonstrates high consideration for version control and hand-off
Translation	User can find useful translation within 90 seconds	User can find useful translation within 60 seconds	User can find useful translation within 30 seconds
Strategy discovery	User can find useful strategy within 180 seconds	User can find useful strategy within 90 seconds	User can find useful strategy within 30 seconds
Strategy application	User can apply strategy with confidence within 60 minutes	User can apply strategy with confidence within 30 minutes	User can apply strategy with confidence within 15 minutes
Scale and access	Can be used by up to 100 people, 5 at once; can be used on any device; design does not accommodate for eventual porting to other languages (Spanish, Portuguese, etc.)	Can be used by up to 500 people, 20 at once; can be used on almost any device; design allows for eventual porting to other languages (Spanish, Portuguese, etc.), but with significant effort	Can be used by up to 1000 people, 50 at once; can be used on any device; design allows for eventual porting to other languages (Spanish, Portuguese, etc.)

1.7. Life of the project beyond capstone
Does this project exist beyond completing the capstone course? Will it help you get a job, get a promotion, create a portfolio, or launch a business? Will your capstone be used or experienced by your target audience after this class?

My project will continue to be iterated on as I develop more functionalities for broader and broader audiences. For example, it is scoped now for North American secondary school teachers, but it could well expand to assist Latin American secondary teachers or North American primary school teachers.

I don't believe it will help me get another job. I am primarily doing this out pf my own desire to help struggling teachers, as I was once one myself.

My project will be utilized after the capstone and throughout this school year -- and hopefully into coming school years as it is iterated and integrated further into the teaching workflow.

2. Competitor review

Identify 3 similar pieces of work created by other people. These pieces of work might have been developed for the same goal as your project's goal, or for a different goal but are similar in nature. It could also be a piece of work from a different field, which can bring some inspiration for your project or parts of your project.

For technology projects, this may include other websites, other applications, or similar technologies. For film projects, this could be other films, or it could be a similar story in other formats (book, article, cartoon, etc.). For instructional design, this could be other online courses, courses in other formats, or books, YouTube videos, and other methods of instruction.

Name	Description	Dimension being compared	Advantages	Disadvantages
http://www.beesburg.com/edtools/glossary.html	List of instructional strategies posted on a website	Content	Exhaustive list of cognitive, emotional, social, and behavioral strategies and interventions	Only way to search is by alphabetical shortcut. Unless the user knows the name of the strategy, they will be unable to find what they want in a short amount of time.
http://www.kayak.com	Interactive website to select flights	Flow	Two-part selection process – basic parameters and drill-down filters	Busy interface that takes time to familiarize with
http://fcit.usf.edu/mathvids/strategies/completelist.html	List of instructional strategies posted on a website, accompanied by videos and	Content/experience	Video materials chunked into steps, lists of materials and complementary activities, extensive descriptions	Media is 20+ years old, poor site UX, not concise, language can be inaccessible to beginning teachers

	implementation guidance			
https://www.plot-generator.org.uk/	Interface to generate story plots	Experience/flow	Narrowing down by genre then expansion by idea produces precise but diverse results	Exposing many possible ideas at once takes up a lot of screen real estate, which is not ideal for mobile
https://www.facinghistory.org/resource-library/teaching-strategies	Bank of teaching strategies chunked by type	Content/flow	Strategies can be searched by title or by type, making discovery much more efficient	Categories are very broad, with some types, such as "Image Analysis", encapsulating 50+ strategies. Ordering is just alphabetical, instead of by relevance

3. Technology requirements

All projects: Identify the different technologies you will need to complete your project and how they will be used in your project. Map each technology to a course you took, to your professional experience, or indicate that this is a technology that you are learning on your own.

1. Node.js
- description: back-end JavaScript framework
- related courses or professional experience: E-31 Intro to Node.js
- alternative technologies, technologies used by competitors:
LAMP/MAMP, Ruby on Rails
- reason for selecting this technology vs. its alternatives: flexibility with progressive web apps, personal familiarity, broad selection of libraries for web apps
- how it will be used in your project: Node.js will serve as the back-end, populating the page with new results based upon a user's search parameters

2. Client-side JavaScript
- description: front-end JavaScript
- related courses or professional experience: E-15 Screen-based and Physical Computing
- alternative technologies, technologies used by competitors: flash
- reason for selecting this technology vs. its alternatives: broad adoption across browsers, personal familiarity, extensive support and documentation
- how it will be used in your project: UI and transitions in the browser

3. Sass
- description: CSS compiler and productivity framework
- related courses or professional experience: E-27 Modern and Mobile Front-end II
- alternative technologies, technologies used by competitors: Less, Uikit
- reason for selecting this technology vs. its alternatives: flexibility with new browser technologies, personal familiarity, broad selection of out-of-the-box functionalities
- how it will be used in your project: dynamically scaling across devices, visual accessibility, clean and modular code

Additional questions for Instructional design projects: Discuss the technologies used for your project. What LMS will you use and why? Is there a film component? Other technology-based components?

I will also be conducting significant user research in South America and North America to determine the query model through which users will access and discover new strategies. This will utilize adult learning theory, which was addressed in-depth in E-111, Adult Online Learning: Theory. I will also be designing the interface for intuitive and natural patterns, as well as common visual grammar in digital interfaces, concepts that were covered extensively in E-170, Information Systems Design.

4. Visuals describing how your product will be used

Technology projects: Broadly describe how the product will work. What is this thing you're building? Refer to your elevator pitch and possibly elaborate. Use diagrams, screenshots, or mockups if these are helpful. Describe your product in general, as well as some features in detail.

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).
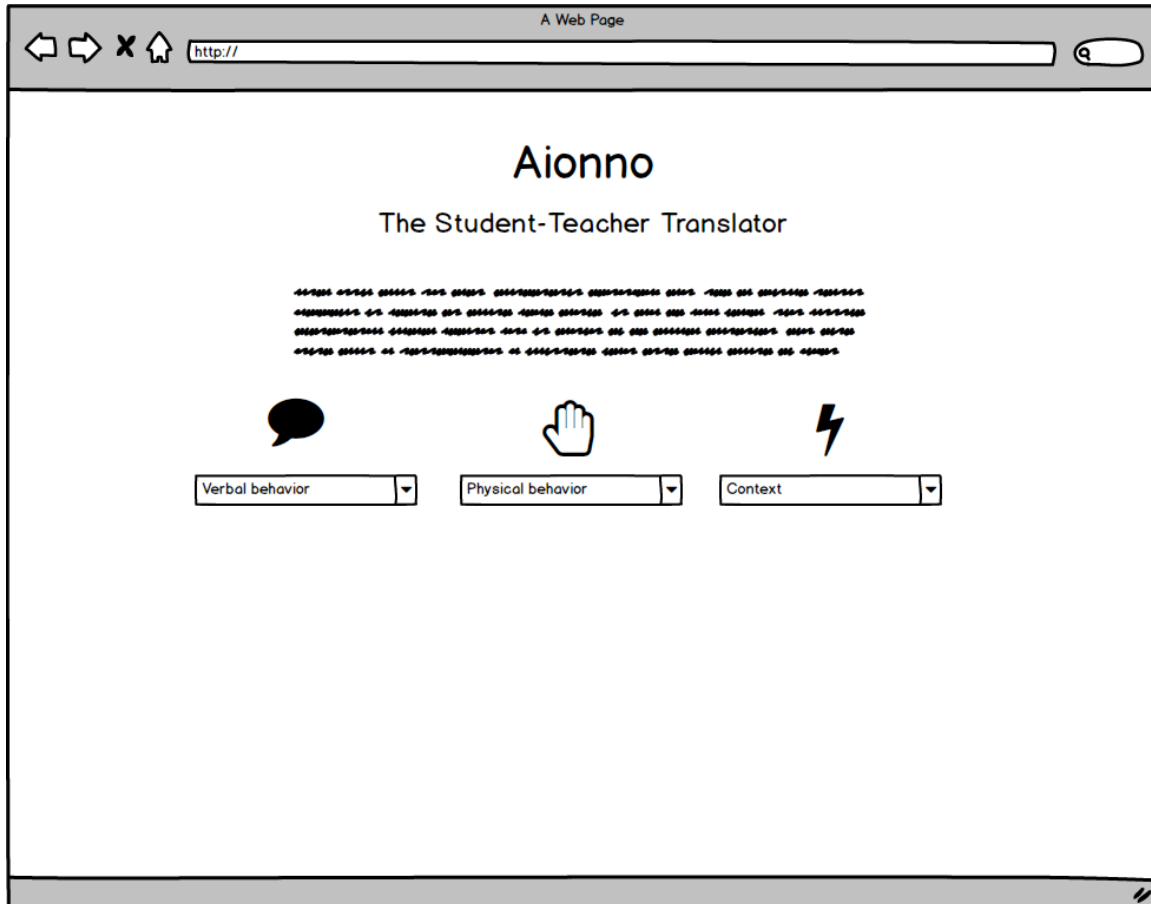
Diagram 1.1

Then, the user will select the dropdown options for "verbal behavior", "physical behavior", and "context" that best match their experience. These 3 attributes will combine to signify the instructor subjective experience in the classroom environment and their impression of the obstacle. (Diagram 1.2)
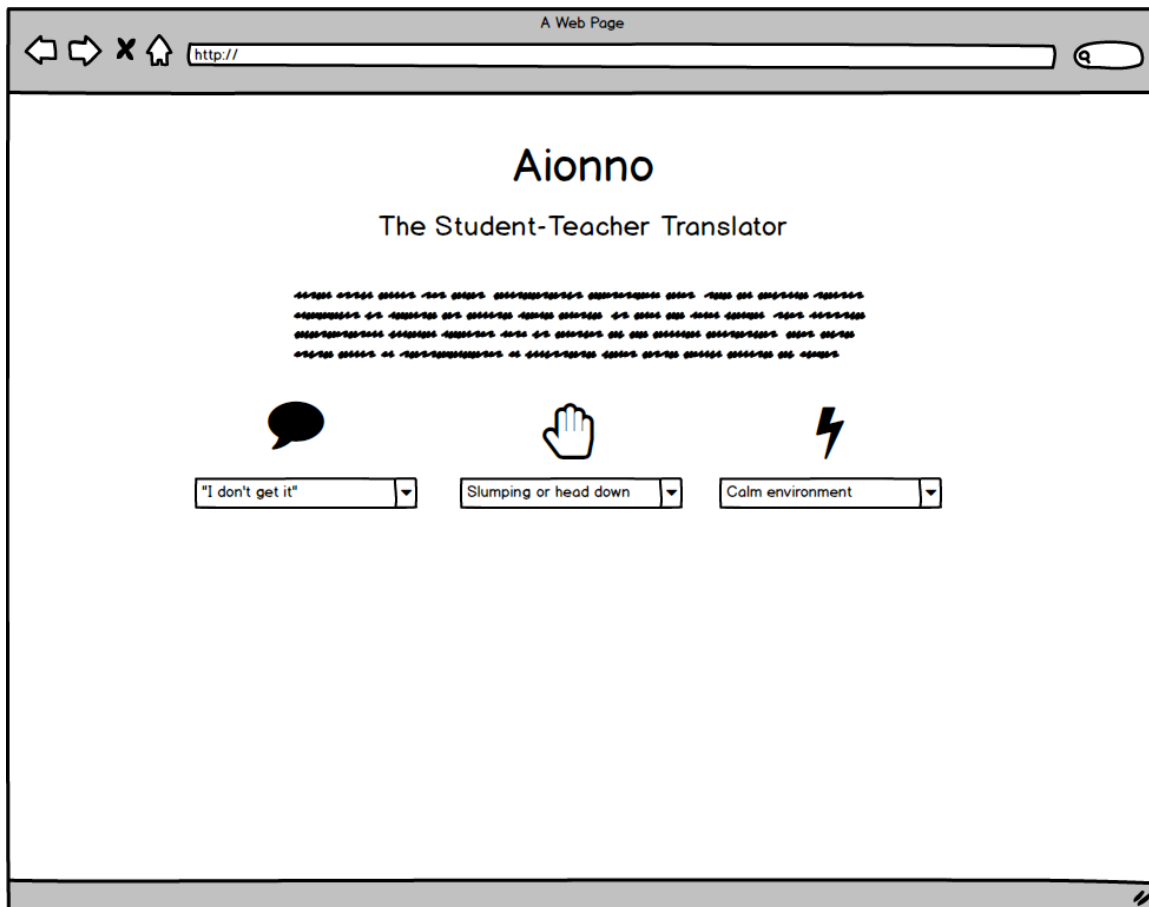
Aionno

The Student-Teacher Translator

(illegible placeholder text)

| "I don't get it" ▼ | Slumping or head down ▼ | Calm environment ▼ |

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.

Aionno

The Student-Teacher Translator

~~~~~~

"I don't get it" ▾	Slumping or head down ▾	Calm environment ▾

"This is beyond my grasp"

Strategy: chunking content	Strategy: accessing background
~~ Learn more here	~~~~~~ Learn more here

"I feel out of place"

Strategy: value statement	Strategy: stereotype threat
~~ Learn more here	~~~~~~ Learn more here

"I feel overwhelmed by my tasks"

Strategy: constructive worry	Strategy: bullet journal
~~ Learn more here	~~~~~~ Learn more here

Show me more

Diagram 1.3

The user can then peruse the strategies available to them, and either select "Show me more" to extend the search results, "Learn more here" to delve into strategy and implementation specifics, or select a new set of attributes to perform a novel search.

INSTRUCTIONAL DESIGN BRIEF

High-Level Overview. Briefly describe your learning experience, including the type of learning experience, intended audience, duration, etc. Use the Instructional Design Mad Lib to assist you.
I'm designing a 2-minute just-in-time app for secondary teachers to discover classroom strategies. This is important because educators struggle to identify potential interventions that precisely address failing classroom circumstances. As a result of this experience, users will be better informed of applicable strategies and more confident in their capacity to administer their classrooms.

Content Topic: Identify the content topic that will be explored. Though broad, this is often where instructional designers begin.	Big Idea: Keep in mind the misunderstanding or gap, and identify the big idea, a **_concept_** about this topic that is worth knowing and can be applied to other content/contexts. It provides a unifying and thoughtful way to focus the design of the project. The big idea should be expressed in a few words.
Classroom strategies	Why one strategy is more applicable than another

Misunderstanding or Gap: Think about the prior experiences, knowledge, and mindset of the learners. What might they misunderstand about this topic or what is a gap in their thinking/experience that prevents them from understanding this topic and/or big idea? This may be informed by any combination of research, observation, or interviewing.
Users might think that there is one strategy for each circumstance. This is likely false; there are multiple interpretations and tools for each scenario. A full "menu" of possibilities is useful, as well as a sorted ranking for most likely to be useful.

6 Facets of Understanding: The 6 facets are a tool to help unpack what deep learning looks like. Not all facets are applicable for all projects; however, consider each one. What could a possible desired understanding or learning outcome be through the lens of each of the six facets? Share your notes here.

Explanation: Really gets at explaining something in the learner's own words Having to explain the circumstances in a classroom will force them to dissect, albeit	Perspective: Gets at what it means to see the big picture or consider various points of view

subjectively, exactly what is and isn't occurring, particularly at the point of intervention.	
Interpretation: How to make sense of something Multiple "translations" of student expression provokes deeper interpretations into the cause and outcomes surrounding the scenario.	Empathy: Asks the learner to "walk in another's shoes" Within the cycle of the app, users will have the opportunity to empathize with those in their classroom by closely identifying actions and responses, and will thereby gain perspective into what all classroom agents are doing to contribute to the dysfunctional scenario that has prompted the use of a strategy.
Application: Matches knowledge to context As users interact with the interface, they will be gradually connecting classroom interactions and observations with potential solutions.	Self-Knowledge: Gets learners to think about their own thinking

Why/Enduring Understanding(s): Frame your big idea as 1–2 understanding statements. The understanding statement is expressed as a full-sentence statement and represents an insight, inference, or conclusion about the big idea that learners should gain. Rather than the facts you want them to learn, the understanding statement looks to the meaning of the facts.
Learners will understand that each classroom situation has a potential strategy that can be applied to improve conveyance, exchange, collaboration, etc.

Evidence of Understanding: How will you know that your learners have obtained the desired understanding? This is often thought of as assessment in formal learning environments. For self-paced and informal learning experiences, this may be more difficult to identify but try.
Users will apply the strategy and, in later iterations, rate how well the strategy mapped onto the scenario. (I do not plan on enabling this feature for the current iteration.)

Learning Flow: What is the general flow of the learning experience? You may provide a bulleted high-level list, create a Journey Map (a timeline that graphically maps the experience), or other graphic organizer.

- Enter app via web browser
- Read description and purpose of site
- Choose descriptions to explain classroom situation and student expression
- View results of search manifested as list of possible student "translations"
- Focus on which translation best fits their needs/expectations
- Click on strategy to learn more about implementation
- Implement strategy
- Perform new search (as needed)

Learning Theory(ies): What learning theories—the way in which how people learn—will your learning experience draw upon? List them and make sure you research them further to see how they inform the approach you'll take.	Pedagogies: What pedagogies—methods of how people teach—will your learning experience draw upon? List them and share why.
The app is largely based on behaviorist learning theory (Skinner) in that each "behavior" exhibited can be more or less classified and matched with another defined strategy that maps to it with regular success.	Connectivism is fundamental to the app. The experience collects and organizes the sum resources of the internet and provides a portal for initial discovery and recommendation. Users are encouraged to take this discovery point and extrapolate to new strategies and resources, which will be readily linked in the app itself.

Inspiration: Identify at least three other learning experiences/products that inspire your project, e.g, workshop, training, e-learning course, game, curriculum, museum exhibit, YouTube channel, etc. Be specific.

First, I'm inspired by the discovery flow on kayak.com due to its rich feature set, intuitive dashboard, and clean layout. The rapid load times and graphical representations of recommendations is excellent UX-wise

Second, I take inspiration from Khan Academy in their instructional flow and adaptivity to learner needs. It is clear they have done a lot of user testing and interviews to understand how online learning best operates for their user group.

Third, I look to the design thinking workshop model, which emphasizes empathy, prototyping, and iteration with the users in mind (and present in the development process).

5. Work plan and milestones

Create a list of all deliverables you will generate for this project. Along with this, generate estimated due dates for each deliverable. In developing this plan, consider that some tasks will run together, some must be consecutive (one cannot start B before A is finished), and some can be completed at any time.

Finally, identify milestones. How do you know you're on track to finish this project on time? How will you know if you're ahead or behind schedule?

TASK NAME	START DATE	END DATE	DURATION (DAYS)
Complete User Research			
Interview instructors	7/23	8/30	38
Ascertain the breadth of strategies	7/23	8/30	38
Determine input schema	8/17	9/10	24
Sketch initial UX with user input	8/20	9/10	21
Create mock-up			
Create basic storyboard	9/10	9/20	10
Create clickabe prototype	9/10	9/20	10
Code app back-end			
Refamiliarize with frameworks (node.js, PWA)	9/20	10/1	8
Set up server-side technologies	9/25	10/20	18
Code app front-end			
Refamiliarize with frameworks (Sass)	10/20	10/25	5
Set up client-side technologies	10/25	11/20	26
QA/User testing			
Alpha testing	11/20	11/25	5
Beta testing	11/25	12/1	6

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.

6. References

The Impact of Enhancing Students' Social and Emotional Learning: A Meta-Analysis of School-Based Universal Interventions
Author or company that published the article: University of Chicago
URL: https://onlinelibrary.wiley.com/doi/full/10.1111/j.1467-8624.2010.01564.x
Relevance to project: Summary of socio-emotional strategy implementations and expected return from interventions. This article informs the rationale and purpose behind instituting broad and precise strategies in the classroom.

Active Learning: 101 Strategies To Teach Any Subject
Author or company that published the article: Silberman, Mel
URL:
https://eric.ed.gov/?id=ED424243&xid=17259,15700021,15700124,15700186,15700190,15700201,15700237,15700242,15700248
Relevance to project: This guide to practical and timely strategies for cognitive intervention and active learning models a selection schema by which strategies can be chosen.

Microdados (Microdata)
Author or company that published the article: INEP (National Institute of Education a Research Analysis)
URL: http://portal.inep.gov.br/microdados
Relevance to project: These data sets from Brazil evidence the areas of need for classroom teachers in a South American context. As the app will apply to non-North American teachers, these data inform how I devise interface interaction and map to teacher needs.

Instructional Strategies
Author or company that published the article: For the Teachers
URL: http://www.fortheteachers.org/instructional_strategies/
Relevance to project: This guide to classroom strategies sets out an organizational method for choosing interventions. The context-driven schema makes search and application more intuitive.

Pedagogies & Strategies
Author or company that published the article: Vanderbilt Center for Teaching
URL: https://cft.vanderbilt.edu/teaching-guides/pedagogies-and-strategies/
Relevance to project: This source informs sub-categorization of media and strategies.

The Use of Scaffolds for Teaching Higher-Level Cognitive Strategies
Author or company that published the article: Rosenshine, Barak; Meister, Carla
URL: https://eric.ed.gov/?id=EJ442788
Relevance to project: Approaches to multi-step strategy and long-term development of cognitive capacities in the classroom.

Cognitive strategy instruction that really improves children's academic performance.
Author or company that published the article: Pressley, Michael
URL: https://psycnet.apa.org/record/1990-98396-000
Relevance to project: Approaches to multi-step strategy and long-term development of cognitive capacities in the classroom.