



CS 147  
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# Executive Summary

## Project Name & Value Proposition

### **Project Name**

EKG — *Engage. Know. Grow.*

### **Value Proposition**

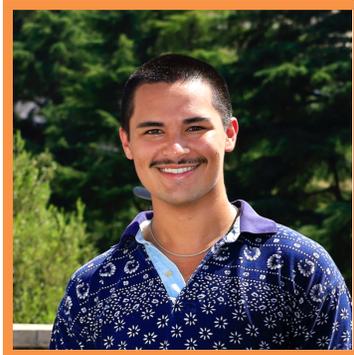
EKG collects both static and dynamic student information to be shared with teachers and offers suggested activities to improve teacher & student relationships.

Team Members and Roles

# - THE TEAM -

**Matthew G.**

**“The Designer”**



**Jessica Y.**

**“The Organizer”**



**Oumnia C.**

**“The Developer”**



**Baihan Z.**

**“The Director”**



## Problem/solution overview

### Problem

Teachers struggle to develop meaningful connections with students. This leads to difficulty engaging students effectively, lower trust, reduced motivation, and overall less effective learning environments.

### Solution

EKG is a tool for grade 6th-12th teachers that collects both static and dynamic student information to be shared with teachers and offers suggested activities to improve teacher & student relationships. It uses truth or dare, two truths and a lie, and AI generated improv games to collect information about the students.

## Needfinding

### Interviews

Needfinding interviews are a cornerstone of human-centered design, offering invaluable insights into the real-world challenges, desires, and contexts of potential users. For EKG, a tool designed to help teachers better understand their students, these interviews provide a direct window into the day-to-day experiences of educators and students. By engaging with teachers through structured conversations, we can uncover not only their explicit needs—such as streamlining classroom management or enhancing student engagement—but also latent needs they may not articulate, like fostering deeper connections with students. This process ensures that EKG is built on a foundation of empathy and relevance, aligning its features with the genuine problems teachers face and the meaningful outcomes they seek.

Interviewee	Interaction Method	Description	Summary Quotes
Hannah*	Zoom	Founder of a graduate school focused on teacher preparation	“Teachers when they are empowered with this kind of data, make a difference and they help students succeed at higher levels.”
James**	Zoom	Manages residential liberal arts education program	“Stanford teachers usually do not see it as their job to care about the student as a whole person.” “One-on-one meetings were essential to understand what the student thought college was going to be about!”
Samantha	At-School	Acting teacher at a large university	“Teachers want to get together to talk about students they share, but schedules

			are too tight and often there's no time. It happens much more informally."
Laurel	At-Home	High school junior at a high achieving high school	"It would be easier at times if teachers knew some important information about me, especially in situations where it would be weird to go up to a teacher and tell them."
Andrea**	Zoom	Elementary school teacher	"I create student portfolios and offer them to the 1st grade teachers but only once has a teacher accepted them."
Mariah	At-School	High school math teacher	"I send out a Google Form for students to complete as an assignment and students are forced into the process of sharing information in a very impersonal and boring way"

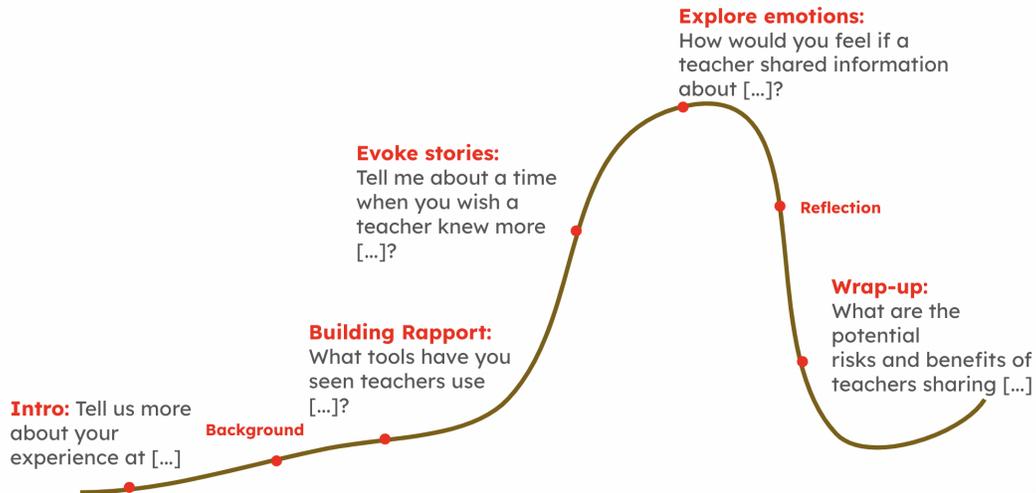
\* Domain Expert

\*\* Extreme Users

We relied on personal networks to identify a variety of useful perspectives and did not offer compensation.

### Scripts

The creation of the interview scripts for EKG involved careful consideration of the unique perspectives and needs of teachers, students, and domain experts. These scripts were designed to elicit rich, qualitative insights into how information about students is currently managed, the challenges in building meaningful teacher-student connections, and opportunities for improvement. Teacher-focused questions explore their workflows, tools, and attitudes towards student data, emphasizing how understanding students at a deeper level can impact teaching strategies. For students, the questions aim to uncover their feelings about data privacy, their relationships with teachers, and how shared understanding can influence their educational experience. The domain expert questions provide a broader context, drawing on research and professional insights into the importance of fostering strong connections in education. Together, these scripts ensure a holistic understanding of the ecosystem EKG aims to support, grounding the app's design in the lived experiences and needs of its users.



#### Teacher Questions:

- Tell me more about your experience at [Insert name] school. (Time spent there, teaching experience etc.)
- What kinds of information are you typically provided when you receive a new student, and how do you use that information?
- In what ways do you think having more information about your students could help you?
- If you could learn anything about your students to better support them, what would it be?
- How do you usually gather personal or academic information about your students?
- Do you currently share student information with other adults? Can you tell me about that? (What? Why? Who?)
- Can you describe your current approach to keeping notes or records about your students?
- How do you keep track of those notes, and how do you organize them?
- What factors influence when or how often you update your notes about a student?
- How do you balance student privacy concerns with the need to document important information?
- What online tools or platforms do you and your school use to manage student data, and how do they impact your workflow?
- When a student shares a personal challenge with you, what factors guide your decision on whether to share that information with other teachers?
- If a student is struggling academically, how do you collaborate with other teachers to address their needs?

#### Student Questions:

- Tell me more about your experience at [Insert name] school. (Time spent there, classes, friends etc.)

- Do you think it's important for teachers to keep notes or records about students? What kind of information do you think should be recorded?
- What concerns do you have about your personal data or academic information being recorded or shared?
- What online tools does your school use for managing student data, and how do you feel about them?
- What's something about you that you wish your teachers understood better?
- How do you think a teacher's understanding of your personal experiences or challenges could affect their ability to teach you?
- Have you ever felt comfortable sharing personal or academic information with a teacher? Why or why not?
- How would you feel if a teacher shared information about a personal or academic challenge you were facing with other teachers? What circumstances would make this acceptable or unacceptable to you?

#### Domain Expert Questions:

- Tell me more about your research/your experience with [insert field].
- Why is it important for teachers to get to know their students on a deeper level?
- What are some effective methods you've seen or recommend for teachers to build better relationships with students?
- What kind of additional information do you think could help teachers better support their students' needs?
- In your experience, how do teachers handle the balance between gathering useful information about students and respecting their privacy?
- What are the potential risks and benefits of teachers collaborating and sharing personal or academic information about students?

## Synthesis

The synthesis of our needfinding interviews revealed key observations, insights, and learnings that shape the foundational understanding of the challenges EKG seeks to address. From observing the unique hurdles faced by new teachers and the invisible ways educators gain information, to recognizing the critical importance of confidentiality and one-on-one interactions, we identified patterns in the teacher-student dynamic. These observations highlighted that while personalization is a general goal, the deeper aim is building meaningful relationships—a process hindered by the lack of time and support for teachers and the limited application of educational research. Insights further underscored the unmet need for tools that help teachers better understand their students, while respecting students' varying comfort levels in sharing personal information. This synthesis distills the core of what EKG aims to address: bridging the gap between teachers' desire to know their students better and the practical, ethical, and logistical barriers they face in achieving this goal.

#### Observations:

- Special Challenge for New Teachers.
- Teachers Gain Information Invisibly.
- Confidentiality/Consent is Important.
- Value of 1 on 1 Interactions.
- Research is Not Applied.
- Teachers Have No Time.

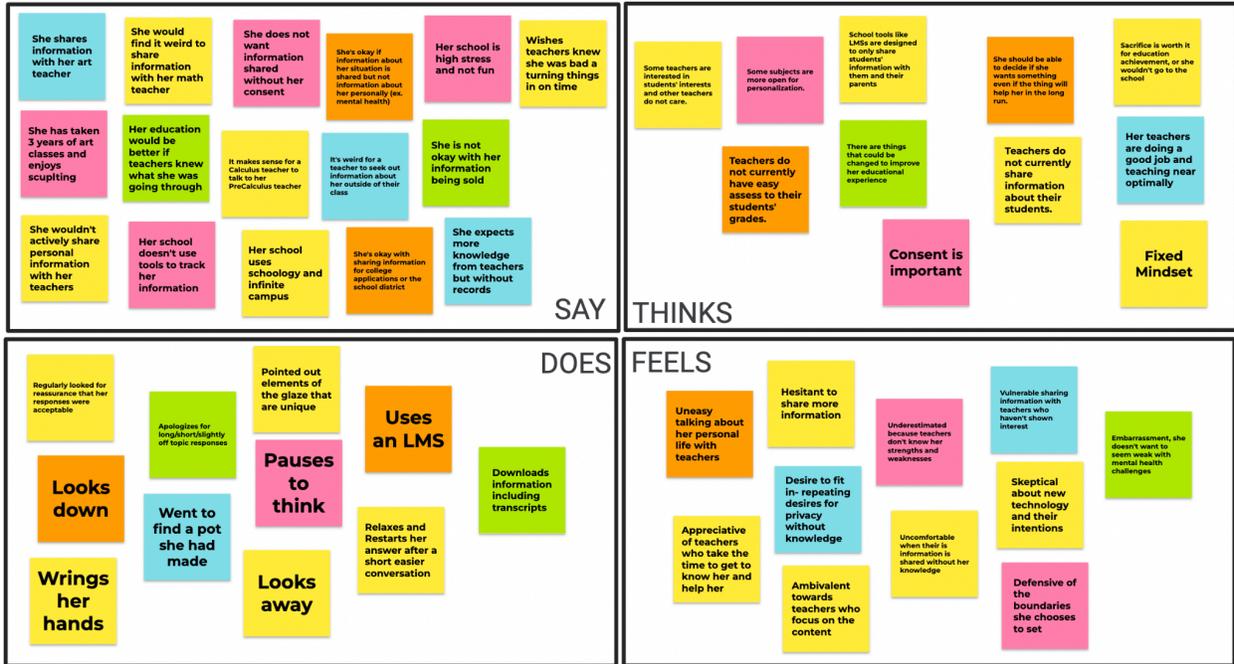
Insights:

- General Goal of Personalization.
- A Relationship is the Real Goal.
- Teachers Lack Support.

Key Learnings:

- Teachers want to know more about their students.
- Knowing additional information about their students would assist teachers.
- Students may not necessarily want to share information with their teachers.

Laurel's empathy map illustrates a deeper understanding of the internally complex feelings students have around student-teacher relationships.



## POVs & experience prototypes

### POV statements

Of the six interviews we formed three POV statements that expressed the diversity of perspectives. These diverse perspectives helped us to consider several different paths to solving the general problem of building teacher-student relationships.

<p>Andrea's POV</p>	WE MET Andrea, a Pre-K teacher in Plano who tracks a large amount of data regarding students' academic progress.
	WE WERE SURPRISED TO REALIZE She has offered to provide data to her students' next teachers and they have not taken advantage of it.
	WE WONDERED IF THIS MEANS teachers don't have time to take in the information OR teachers don't believe the information about their students is useful.
	IT WOULD BE GAME CHANGING TO save teachers time by learning about their students OR give teachers useful information tailored to students' ages.

Laurel's POV	WE MET Laurel, a high school student who lives in Palo Alto and attends a
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	rigorous school.
	WE WERE SURPRISED TO REALIZE she wanted her teachers to know more about her, but did not want to inform them personally.
	WE WONDERED IF THIS MEANS she would be more accepting of a solution if she wasn't aware of its use.
	IT WOULD BE GAME CHANGING TO give teachers a path to understand students without student involvement.

<p>Samantha's POV</p> 	WE MET Samantha, a seasoned Acting lecturer, a professional actress, a director, and a key presence in the TAPS department.
	WE WERE SURPRISED TO REALIZE despite her experience, Samantha still finds herself seeking advice from other educators and relying on her limited network of teachers.
	WE WONDERED IF THIS MEANS there is a need for a network of educators and professionals in the education space.
	IT WOULD BE GAME CHANGING TO shape classroom work around what other educators are doing and the professional world.

## HMW Statements

The brainstorming session generated a diverse and creative array of "How Might We" (HMW) statements, reflecting a wide range of perspectives on the challenges and opportunities in helping teachers get to know their students. These HMW statements aim to inspire innovative solutions by reframing core problems into actionable opportunities. From making the process of learning about students enjoyable and rewarding, to leveraging technology, AI, and gamification, the ideas explore ways to reduce teacher workload, enhance collaboration, and empower both teachers and students. They also touch on important themes like privacy, mental health support, and training, ensuring that proposed solutions are not only effective but also ethical and sensitive to the needs of all stakeholders. This collection of statements serves as a rich foundation for ideation, guiding the design of EKG toward impactful, user-centered solutions.

### Andrea:

- HMW motivate teachers to share information about students with each other
- HMW make information about students like a fun book? An article?
- HMW visually represent students' information?
- HMW make receiving student information rewarding instead of burdensome?
- HMW make teachers less tired/ overwhelmed?
- HMW provide results from a single survey to all teachers?

- HMW provide teachers with student information earlier?
- HMW give teacher more time to prepare for a new school year?
- HMW make teachers seek out information about their students?
- HMW make info sharing like a game?
- HMW make learning about kids into a game show?
- **HMW make sharing students' info the most fun party of the teacher's job?**
- HMW standardize data collection from students for teachers?
- HMW provide teachers with the information they want and not what they don't?
- **HMW provide teachers with standardized student data they want and not what they don't?**

#### Laurel:

- HMW invite students to share personal information for another purpose like mindfulness?
- HMW facilitate communication between teachers about their shared students?
- HMW make the student excited about sharing private information with teachers?
- HMW make the process of getting to know the student like a game?
- HMW incentivize students to share their information with teachers?
- HMW leverage parents, siblings, and classmates to help teachers know the student on a personal level?
- HMW improve teacher training to recognize mental health challenges?
- HMW improve teacher training to support mental health?
- HMW train teachers on protecting student privacy?
- HMW destigmatize open communication with educators?
- HMW make students love sharing their information with teachers?
- HMW derive insights about students using AI?
- HMW make sharing an empowering instead of vulnerable experience?
- HMW automatically upload assessment data?
- HMW use AI to analyze student online traffic to share with teachers?

#### Samantha:

- HMW create a social media network for students and teachers?
- HMW connect one classroom to another?
- HMW answer teacher questions before they ask them?
- HMW make the teachers volunteer useful information before a fellow teacher reaches out?
- HMW make the classroom like an internship?
- HMW create an onboarding process for new teachers?
- HMW provide teachers with a network of support?
- HMW crowdsource answers for teachers?
- HMW replace Facebook groups for teachers with something better?
- HMW make LinkedIn but for K-12 education?
- HMW eliminate the need to reach out to other teachers for advice?
- HMW provide students with a different to support them besides teachers?
- HMW improve student access to counselors?
- **HMW create a dashboard of personalized updates for teachers?**

Each of the three HMW statements we selected brought unique perspectives to the table, shaping the final solution for EKG in meaningful ways. While not all the brainstormed solutions were directly implemented, every statement contributed to the design process by highlighting critical areas of impact. Andrea's focus on making student information accessible, engaging, and rewarding for teachers influenced how EKG prioritizes user-friendly design and intuitive data visualization. Laurel's emphasis on fostering trust, protecting privacy, and empowering students informed how the app facilitates respectful and secure communication. Samantha's exploration of teacher collaboration, onboarding, and support networks guided features that enable streamlined information sharing and professional connection. Together, these HMW statements ensured the final solution addresses the most pressing needs of teachers and students, even as some ideas remained aspirational or outside the immediate scope of this iteration.

## Solutions

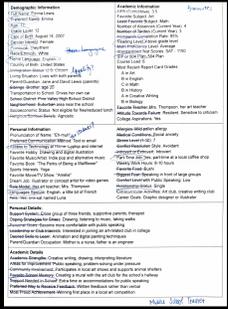
For each HMW statement, we engaged in an expansive brainstorming process to generate a variety of innovative solutions, ensuring a broad exploration of potential approaches. For example, to address "How might we make sharing students' info the most fun part of the teacher's job?" we conceptualized solutions such as an AI-powered platform offering engaging games like improv, quizzes, Jeopardy, and Kahoot, as well as an AI-driven system that creates creative and interactive representations of student information. These ideas focused on transforming information-sharing into an enjoyable, dynamic activity. Similarly, to tackle "How might we provide teachers with standardized student data they want and not what they don't?" we envisioned a platform that integrates student survey data with existing data, enhanced by AI-generated alerts to highlight key insights. These solutions reflect some level of increased focus through the process by focusing in on two of the three selected HMWs, demonstrating how creative problem-solving can lead to impactful tools that address both practical and experiential challenges for teachers.

<b>How Might We Statement</b>	<b>Solution Statement</b>
HMW make sharing students' info the most fun part of the teacher's job?	An AI Empowered one-stop platform for improv games, quiz games, jeopardy, kahoot, etc.
	An AI Empowered system that creates creative representations of student information.
HMW provide teachers with standardized student data they want and not what they don't?	A platform that combines student survey data with currently collected data that provides AI alerts.

## Experience Prototypes

To test our key assumptions, we developed a series of experience prototypes that simulate critical features of the EKG app, focusing on usability, engagement, and relevance. For example, we tested the

assumption that teachers would enjoy sharing student information if it were presented in an engaging way, by creating mockups of AI-developed creative representations of student data. Of the three experience prototypes, two confirmed our assumptions but one provided evidence to disprove our hypothesis. This led to us moving forward with the two aspects of the solution that matched the confirmed assumptions and abandoning the solution based on an incorrect assumption.

Prototype	Assumption Tested	Key Setup	Outcome/ Implications
<p><b>Profile Redaction</b></p> 	<p>Teachers Want to Know (a Significant Number of) Things about Their Students</p>	<p>Teachers were provided a long list of information about a theoretical student and they circled things they wanted to know and crossed out things they didn't want to know.</p>	<p>Teachers were able to quickly and easily prioritize the information they wanted to know. We have a better understanding of what specific knowledge teachers want to know.</p> <p>Assumption: <b>TRUE</b></p> <p>Selected information was used in the database of the high-fidelity prototype.</p>
<p><b>Student Songs &amp; Podcasts</b></p>	<p>AI-generated songs and podcasts are enjoyable and effective at getting to know things about someone.</p>	<p>People were asked to listen to either an AI generated song or podcast based on the information from the profile.</p>	<p>“He kept giggling and couldn't stop cringing. We stopped the song around 1 minute.”</p> <p>Assumption: <b>FALSE</b></p>
<p><b>Truth or Dare Game</b></p>	<p>Students would rather share something with their teacher than do extra course work.</p>	<p>Students were asked to either complete a truth statement sharing personal information or a dare statement asking for their reflection on course content.</p>	<p>The students unanimously chose ‘Truth’</p> <p>Assumption: <b>TRUE</b></p>

Reading Level  
IEP

Extracurriculars  
Age  
Grade  
Pronouns  
Preferred Name  
Birthday

## Design evolution

The design of EKG evolved significantly through iterative development, guided by feedback from experience prototypes, user testing, expert feedback and heuristic evaluations. Initial designs focused on basic data visualization and information-sharing tools but grew into a more dynamic, AI-enhanced platform as we explored how gamification and creative representations could increase teacher engagement. Prototypes revealed the importance of balancing simplicity with functionality, prompting us to refine features like AI alerts and customizable data views to meet teachers' specific needs. Each iteration brought the design closer to its goal of creating an intuitive, enjoyable, and impactful tool that empowers teachers to build stronger connections with their students.

## Final solution

### Description of the Current State:

- Some teachers struggle to collect information about their students to help them teach.
- Other teachers don't collect information because it is so difficult.
- We will build a platform that enables teachers to learn more about their students, and share that information with other teachers.
- Knowing more about students' lives and learning can help teachers better support their students.
- The primary participant is teachers with students being an important secondary participant.

### Solution:

Aspect	Justification
Teachers can learn more about their students	Both teachers and students express a desire to have teachers know more about students in interviews.
Included Information: <ul style="list-style-type: none"><li>● Preferred Name</li><li>● Home Language</li><li>● Access to Technology at Home</li><li>● Languages Spoken</li><li>● Support Needed in School</li><li>● Extracurricular activities</li><li>● Part-time job</li></ul>	These were repeatedly selected by teachers in the experience prototype.

<ul style="list-style-type: none"> <li>● IEP/504</li> <li>● Reading Level</li> <li>● Attendance</li> </ul>	
Teachers can share student information with other teachers.	Teachers are currently inefficiently sharing information so this will assist teachers.
Information will be gathered through games.	Gamification was shown to be a useful motivator in experience prototypes.
Teachers will read student profiles.	More creative presentations were shown to be less effective in experience prototypes.

## Tasks

The design of EKG was structured around four distinct tasks to align with the fundamental ways users may engage with the platform. These tasks were designed to create a seamless workflow, empowering teachers to understand, connect with, and support their students in meaningful ways.

Task 1	Simple	Teacher view student's information
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Viewing user information is the primary goal of the primary user in EKG. All work done in EKG is with the end goal of learning about students which requires an ability to view information about students.

Task 2	Simple	Students play a game in which they share information
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In order to collect timely, important information about students to share with teachers, students need to be incentivized to consistently share personal information. This is done by playing a game in the app.

Task 3	Moderate	Teachers facilitate games to obtain student information
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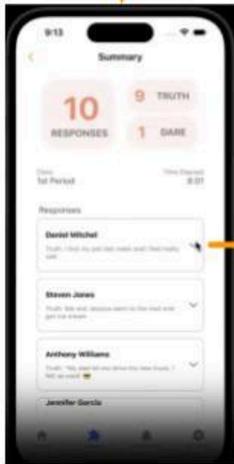
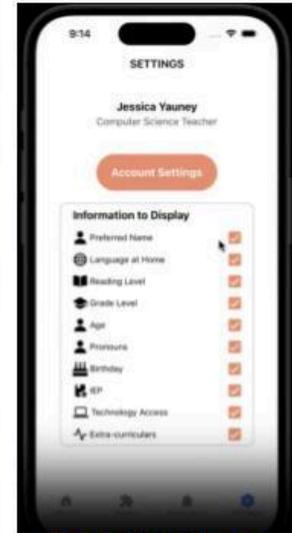
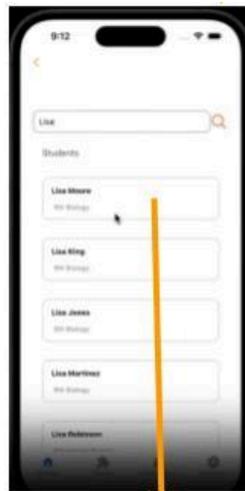
In order for students to interact with customized and useful games, teachers need to have the ability to design and implement games they create.

Task 4	Complex	Teacher responds to alerts about students' needs
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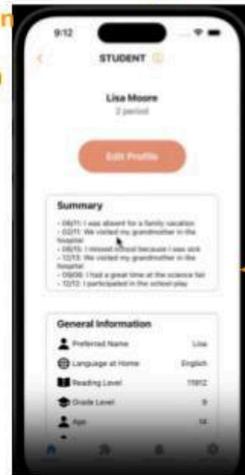
While a lot of information will not be time sensitive or need to be shared with other teachers, some information will need to be responded to in a timely manner to best support students.

Annotated task-flows using images of the final interface





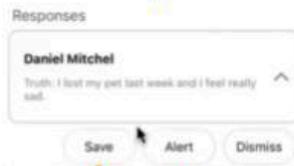
Student information can be viewed by searching for them or by selecting them from the period roster



The settings page allows for account updates and to deselect information so it does not appear in student profiles.

Drop down opens 3 options

The summary information is generated by saved game responses. General information is imported from other district systems.



Information collected in an activity has one more option that notifications received. It can be saved or dismissed but it can also be used to create an alert sending this information as a notification to other teachers.

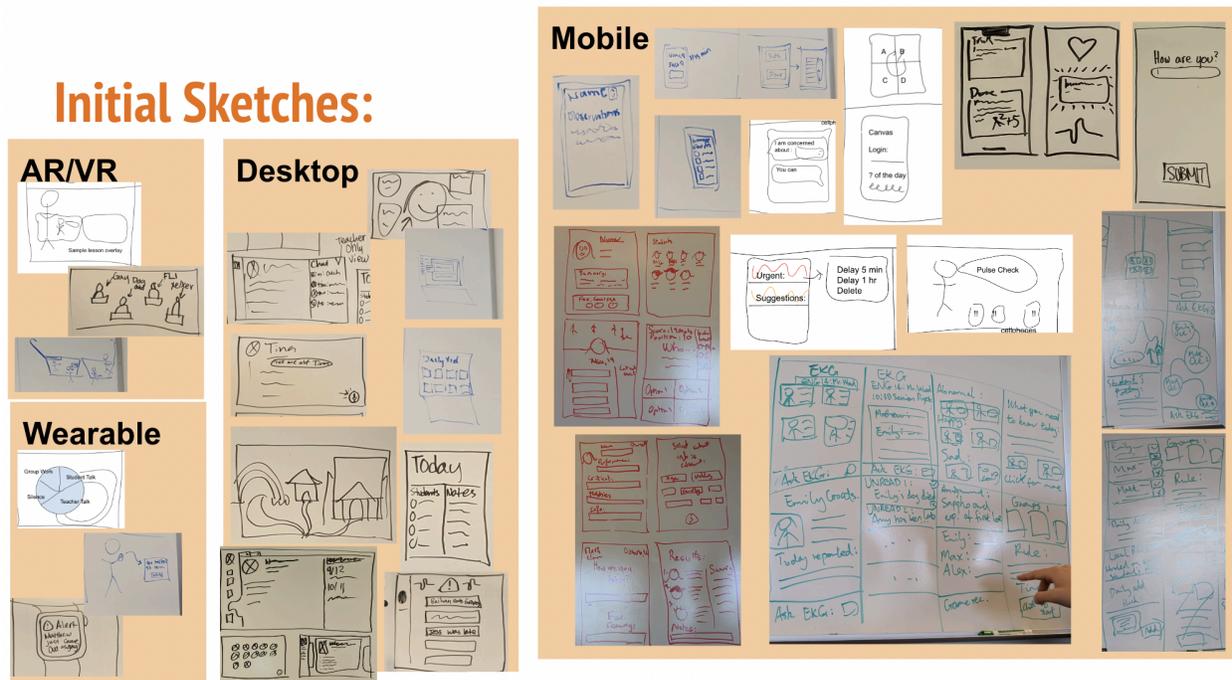
Save is used the same for notifications



# Design evolution visualization(s) and rationale

## Design Iterations

Initial Sketches:



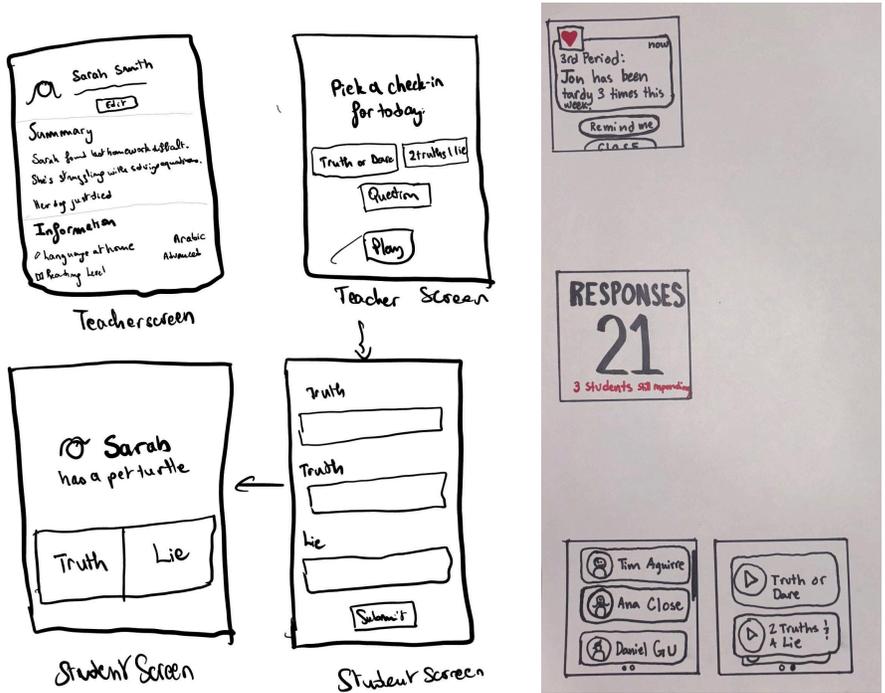
## Learning:

- Mobile is the most intuitive interface.
- Desktop, while intuitive, does not meet project requirements.
- AR/VR while interesting has limited capacity to convey information.
- Wearable provides an interesting affordance not previously considered.

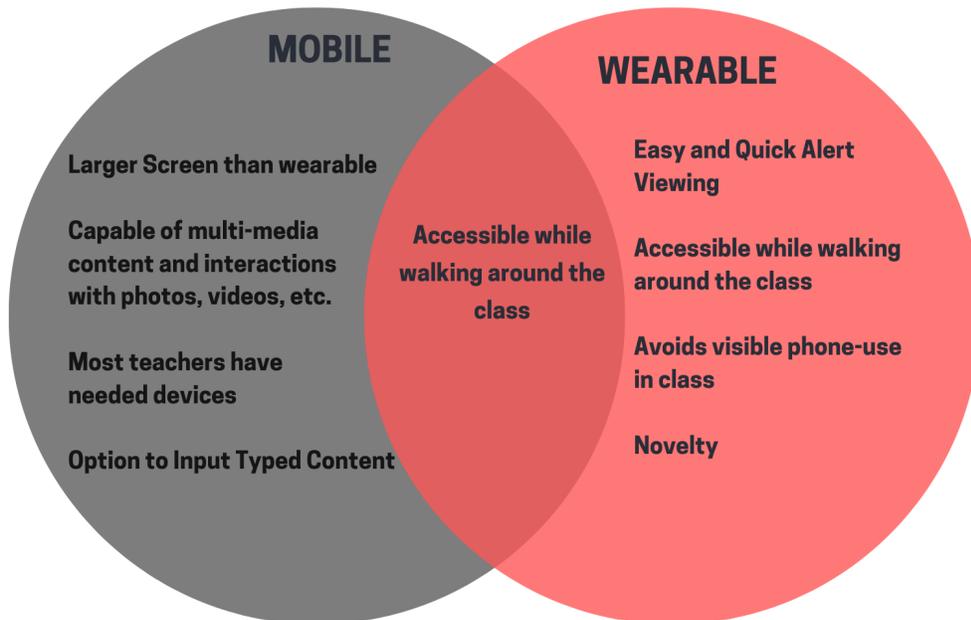
## Changes:

- We moved forward with mobile and wearable designs.

Interface Selection:



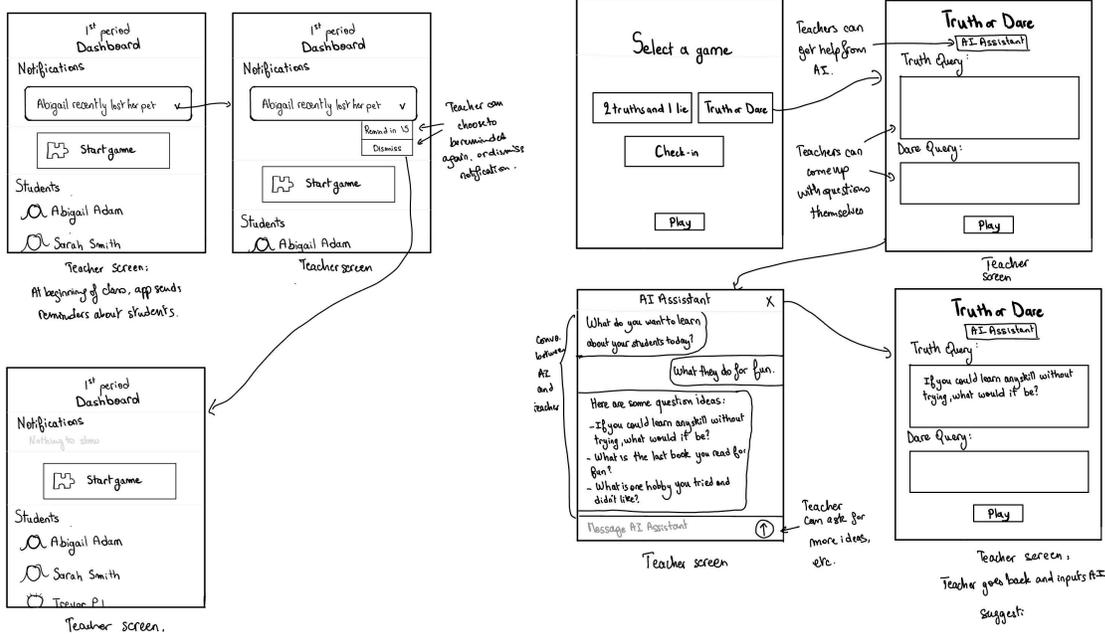
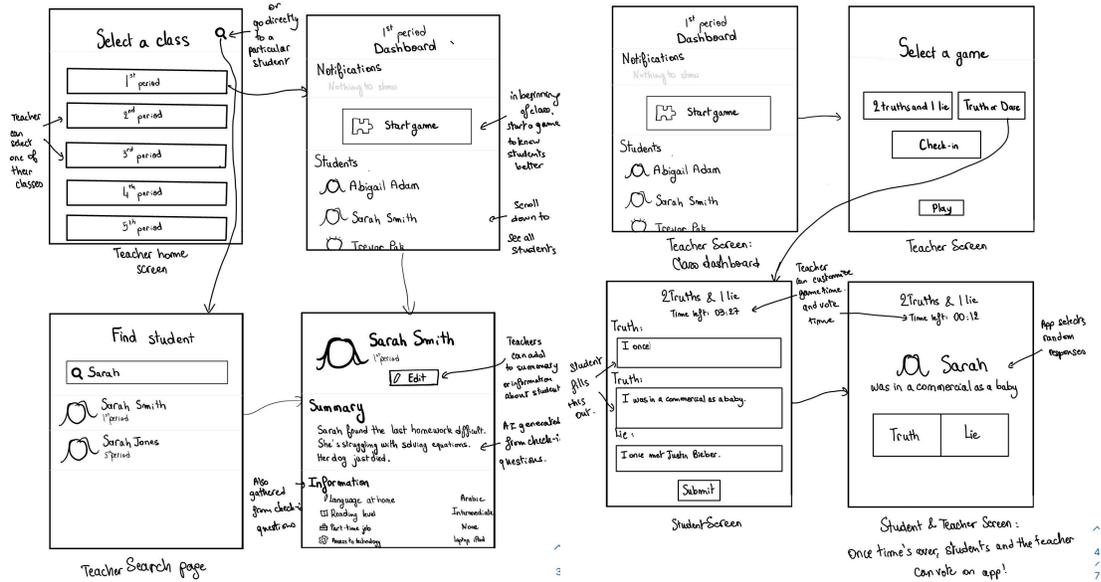
Learning:



Changes:

- We moved forward with only mobile designs.

## Low-fidelity Prototype:



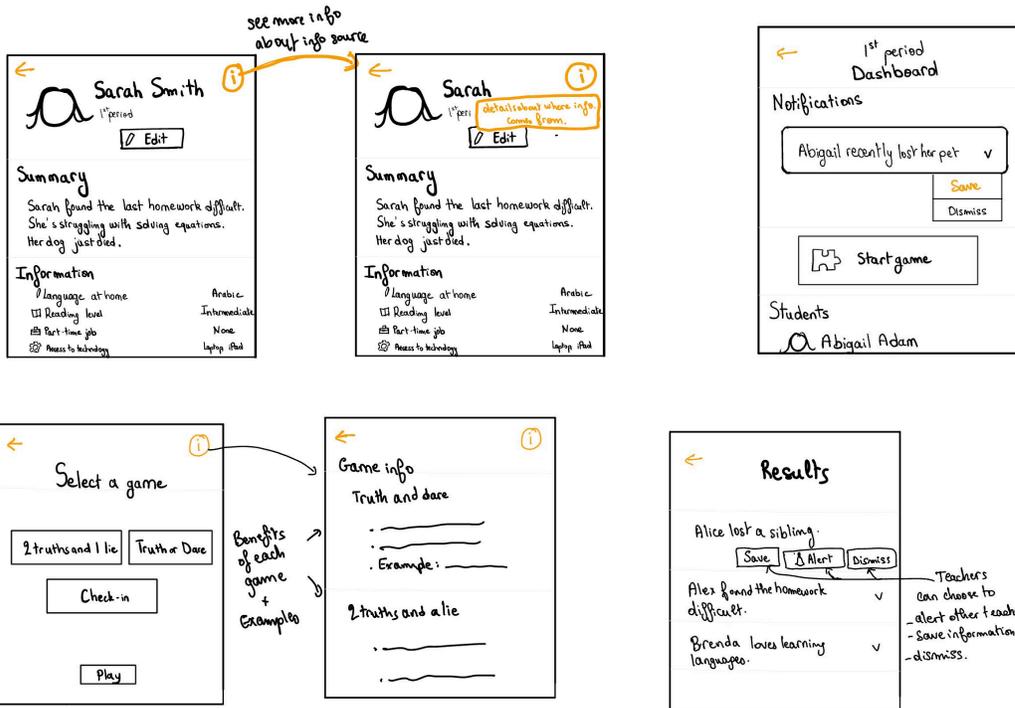
## Learning:

- **Navigation Issues:** Users consistently seek clearer navigation cues, suggesting a disconnect between the platform's design and user expectations.
- **Feature Evaluation:** While primary features like game launching are well-received, secondary features such as reminders are seen as unnecessary, highlighting a misalignment with user needs.
- **Information Transparency:** There is notable confusion around the relevance and timing of notifications, signaling a need for more intuitive information delivery systems.

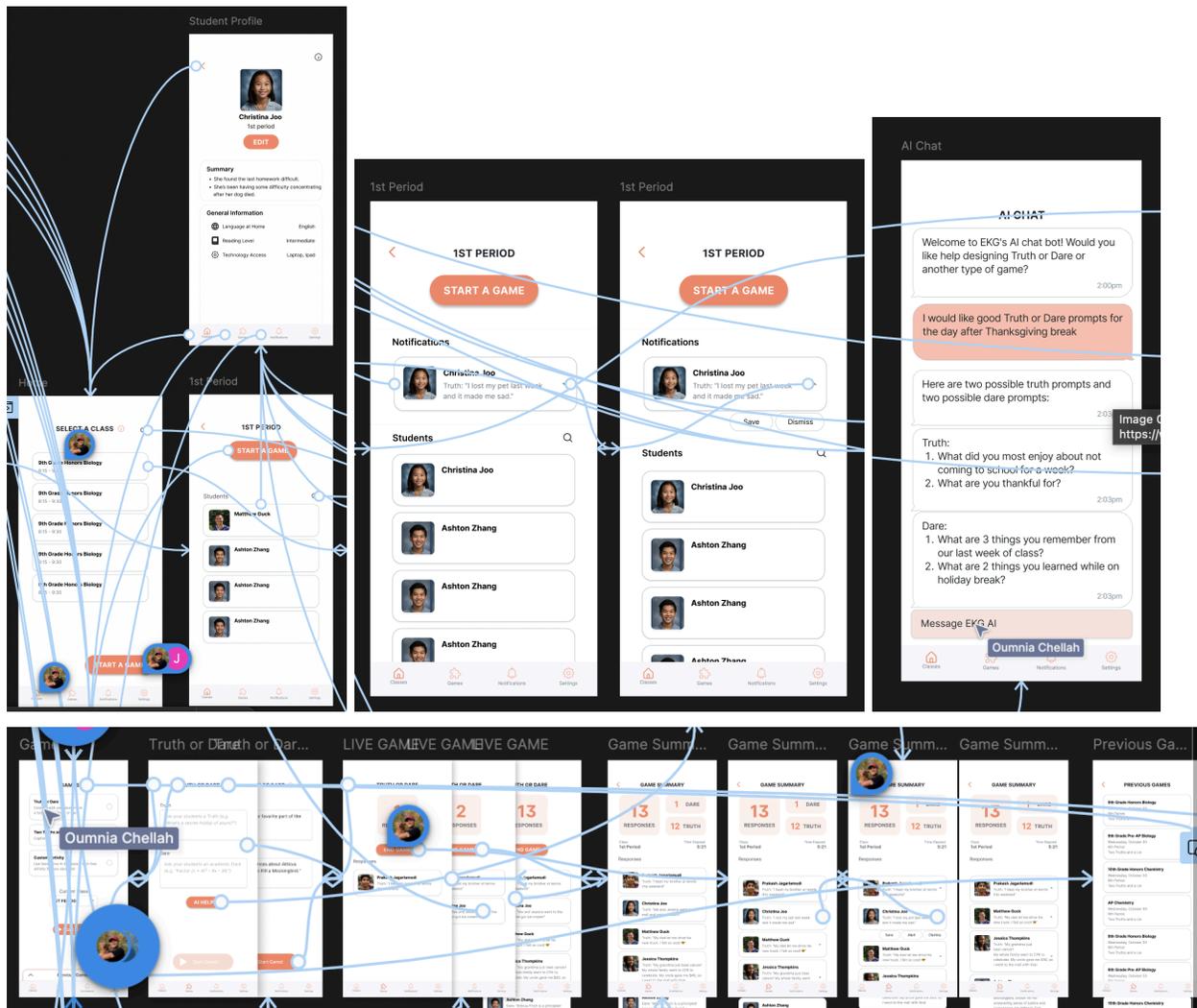
Changes:

- Enhance Navigation: Introduce more intuitive back-navigation options and visible scroll indicators.
- Streamline Features: Evaluate the utility of less-used features, considering removal or modification to align more closely with user needs.
- Improve Information Delivery: Redesign notification systems to be more timely and relevant, and ensure that all informational outputs are clear and directly useful.

Revision Examples:



## Medium Fidelity Prototype:



We received significant feedback through heuristic evaluations. While there were some suggestions that were issues due to the limitations of prototyping, many of the suggestions helped us to learn and improve our application.

On the student page, a lack of context about when the summary was created could lead to confusion or outdated information. When is the summary created and based on which questions / games?

summary might be outdated / confusing if teacher is unsure when it was written

Add a timestamp to the summary so teachers can see when it was created or last updated.

Add a timestamp to individual responses in Student Summary

<p>The back button after viewing Christina Joo returns users to the choose class page, which interrupts their workflow when trying to view another student.</p>	<p>Teachers need to navigate between student profiles quickly. It may cause frustration and time spent searching through repeated actions</p>	<p>Make the back button return to the student list, allowing users to easily switch between student profiles.</p>	<p>Prototyping error; we will make back buttons go back to the previous page.</p>
<p>There's no visual feedback indicating that a notification action like "Save" or "Dismiss" was successful in a classes view on a student card</p>	<p>Users may not know if their action has been completed, creating uncertainty about whether they need to repeat the action or if they took some action</p>	<p>Have a confirmation message or animation (ex. "Saved!" or "Dismissed!") after each action to confirm success</p>	<p>Prototyping Limitation, The button was never implemented. We will have a small confirmation message after users press "Save."</p>
<p>The wording "Start Game" is unclear and misleading. Choice of words "start game" - may suggest that game will be started after clicking on the button.</p>	<p>Start game also appears in the next page - but they actually don't mean the same thing. First "start game" seems to refer to "build / create your game" instead of actually "starting the game"</p>	<p>Replace "Start Game" with "Build Game" or "Create Game" to clearly indicate the action.</p>	<p>We will use "Create Game."</p>
<p>There is no prompt to get teachers to check/review their responses before starting the game. Teachers may ask questions that are too personal or sensitive without realizing it.</p>	<p>While this can be a light-hearted way to get to know students, teachers should be more measured / considered / think more carefully when they ask more serious questions i.e what are the challenges you faced this week, because some of these questions may make certain students uncomfortable.</p>	<p>Add a prompt encouraging teachers to review their questions before starting the game, especially those that may touch on sensitive topics.</p>	<p>Add a reminder on the screen.</p>
<p>after responses are generated, clicking on the student response directs user to their profile</p>	<p>sometimes, the teacher may want to read the game responses more carefully - instead of going straight to student profile</p>	<p>Direct the user to the responses page first, allowing them to review the answers before navigating to the student profile.</p>	<p>Clicking a student response in a game will now take you to a larger view of the response, not the profile.</p>

<p>There is no way to delete games from the previous games page</p>	<p>The user does not have the freedom to delete games from the previous games page</p>	<p>Have a way to delete games in the previous game page</p>	<p>Add Delete Button</p>
<p>AI Help - does not actually explain anything to the user on how the AI will be used</p>	<p>The AI Help button is unclear in its purpose and doesn't explain how it can assist the teacher.</p>	<p>Revise the button label to something more descriptive, such as "Generate Prompt with AI" or "Ask AI for Assistance."</p>	<p>We will use: "AI Prompt Generation"</p>
<p>There is no mention of EKG</p>	<p>The user forgets the name of the app</p>	<p>Put the app logo or symbol in pages</p>	<p>Add Logo on HOME Screen</p>
<p>Lack of subject/level details can lead to confusion about which class is being referenced.</p> <p>If user searches for the student via the search icon - 1st period is stated, but there is no indication of the subject / level</p>	<p>Teachers may not remember the additional details of the class they are teaching.</p>	<p>Add the subject and level below the period for clarity.</p>	<p>Add subject and level below the period</p>
<p>There's no label or icons that indicate that a user can click on student cards for more information when searching for students or in a class view</p>	<p>Without labels or icons indicating more information, users may not realize they can click on each student to view additional details and may miss important information</p>	<p>Add a subtle arrow or icon next to each student's name to indicate that it's clickable, reducing a need to remember this functionality</p>	<p>Add an arrow by each student's name</p>
<p>Inconsistency between "Student Alert" and "1st Period Alert"</p>	<p>Unclear if Student Alert means the student is in multiple periods.</p>	<p>Change to the subject (can list multiple)</p>	<p>Get rid of the subject line.</p>

<p>Having an edit button on the student profile from teacher view</p>	<p>Teachers might think they can edit a student profile</p>	<p>Remove edit button or put an info icon explaining what it means.</p>	<p>Changed to "Edit Profile"</p>
<p>Header and "Start a Game" scroll with notifications when inside of a class view</p>	<p>If a user has a lot of students and/or notifications and they scroll down, the header and button are no longer visible, so they have to remember the period and that it's there</p>	<p>Have the period and button stay fixed to the top of the screen while the Notifications and Students sections are scrollable</p>	<p>Make the header and "Create Game" button always visible.</p>
<p>Allowing multiple game selections at once can confuse users. I am able to select all three games (truth or dare / 2 truths 1 lie / custom activity) at the same time to start the game</p>	<p>Ensure the teacher knows exactly which game they are starting, preventing mistakes and confusion.</p>	<p>Limit the selection to one game at a time.</p>	<p>We never intended teachers to be able to do multiple games at once - it was a Figma problem with the radio buttons.</p>
<p>There is no indicator showing if each notification has been read or acknowledged</p>	<p>Having no clear indicators as to which notifications have been read or acknowledged forces the user to remember these details, which causes a lot of cognitive overhead</p>	<p>Add a "Read" or similar functionality to notifications for user acknowledgment</p>	<p>Add Checkmark for teacher to click on, then it shows "read"</p>
<p>while waiting for game response, I am unsure about how the game is progressing. I only see numbers increasing. No countdown or quick exit after starting game without notifying students</p>	<p>Teachers are unsure of the game's progress without knowing how many students have completed the task or how much time is remaining. Without a countdown or quick exit, users might accidentally start a game and have to notify students. A countdown before the game starts (like 5...4...3) with a cancel option can give users more control if they make mistakes</p>	<p>consider adding a detail to show how many students were present in the class - so that the teacher knows when to end the game.</p> <p>Add a countdown after clicking "Start Game" and add the option to cancel as a form of confirmation</p>	<p>Add number on top that says how many students are present in class, in addition to how many responses.</p>

<p>after game is played - there is a dismiss function when i click on individual function</p> <p>In the settings page, the checkbox labels such as "Technology Access" and "Computer Proficiency" might use terminology that's more system-oriented</p>	<p>The "dismiss" function is ambiguous and doesn't clearly communicate its purpose.</p> <p>Unsure what dismiss means. Does it mean I delete the response? or does it mean i just close the tab and can click onto next student?</p> <p>Users may not immediately recognize what "Computer Proficiency" or "Technology Access" mean in this context and there are no other options besides checking these</p>	<p>Replace "dismiss" with a more intuitive label such as "Close"</p> <p>Be clearer as to what different terminology means. Perhaps for technology access use "devices" as the terminology instead, but this is subjective</p>	<p>Change "dismiss" to "Close"</p>
<p>Back button missing on games page</p>	<p>Missing back functionality makes it difficult for teachers to return to the previous page or section.</p>	<p>Add back button</p>	<p>Add "Back" button</p>
<p>Lack of class details during game setup can confuse the teacher. 1st period in game page does not indicate to user which class they are teaching</p>	<p>Teachers may be juggling multiple classes &amp; this may cause some confusion</p>	<p>Display the class name or subject alongside the period to provide better context.</p>	<p>Display class name in period header.</p>
<p>There is game history in the previous page - but no question history for truth or dare.</p>	<p>Lack of a history of questions asked during Truth or Dare may result in repetition. Sometimes the teachers ask questions that have been asked before.</p>	<p>Add a question history bank to allow teachers to view questions that have already been asked.</p>	<p>Show the completed Truth or Dare prompts when viewing the history of a game that has been played</p>
<p>Once you finish a game, it doesn't say what the truth or dare was.</p>	<p>Teachers might forget what they asked.</p>	<p>Include truth + dare at the top.</p>	<p>Add truth or dare wording at the top of game finish page.</p>

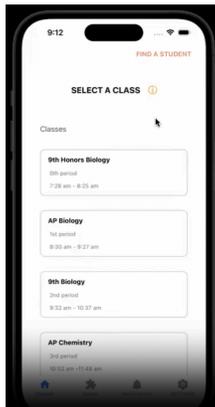
<p>"AI Help" and "Start Game" buttons are the same color and could be close to each other during game creation</p>	<p>The presence of two different orange buttons could confuse users about their purpose if they perform different actions and if are potentially close to each other</p>	<p>Change the color of the "AI Help" button or differentiate it with icons etc.</p>	<p>I think this proposed solution is in direct opposition to what we have learned about color in CS 147.</p>
<p>Each entry in the "Previous Games" page displays basic information but does not summarize the outcome or key results of past games</p>	<p>Users may have to recall the details of each session if they're only given basic identifiers like the class name and date, which may be enough</p>	<p>Add a brief summary or outcome indicator (ex. "Summary Available") for each entry to reduce cognitive load for users</p>	<p>Add basic identifiers: class name, date.</p>
<p>In the games page, to select a game one must click the little selection circle at the right of the box, and clicking the box does not select the game</p>	<p>Someone with reduced finger mobility or vision might find it challenging to select a game</p>	<p>Make sure that a user can select a game by clicking the game box. I.e make the game box clickable, not just the little circle</p>	<p>Prototype issue. Not by design.</p>
<p>The user is not given a choice on game management after a game ends</p>	<p>The user doesn't have the freedom to decide whether a game is saved in previous games or discarded</p>	<p>Put a save game and discard game buttons at the end of the game summary page</p>	<p>Add "Delete Game" button at game end page</p>
<p>The notifications screen doesn't have an option to mark notifications, delete them, or take an action directly from a notification card</p>	<p>Users might want more control over their notifications, such as clearing alerts, mark as read, or saving them for a future use</p>	<p>Add swipe actions on each notification (ex. swipe left to delete or mark as read) or buttons for these actions on each notification card</p>	<p>Add "Delete" in addition to "Save" and "Save and Alert"</p>
<p>There's no clear differentiations between alerts for each notification type, requiring users to recall the context of each alert</p>	<p>Users might not immediately recognize a notification type without carefully reading it, which may slow down their ability to address them</p>	<p>Add recognizable icons to each notification card or use a color-coding system to allow users to quickly recognize alert types</p>	<p>Add recognizable icons for different types of alert</p>

<p>after game is played - there is an alert and save function when I click on individual student</p>	<p>The alert and save functions are redundant and unclear, making it difficult for teachers to understand the difference between them.</p> <p>Alert and save may refer to the same thing. if I want to alert myself to it, I should also want to save the info</p>	<p>Clarify the functions of these buttons by combining them into one action (e.g., "Save and Alert") or providing distinct, clear icons that indicate their separate functions.</p>	<p>Make two buttons - "Save" and "Save and Alert"</p>
<p>The "View all responses" link in the game results page is only accessible after scrolling to the bottom</p>	<p>The page should have this link always accessible without having to scroll all the way to the bottom for ease of use and as a shortcut for experienced users</p>	<p>Have the "View all Responses" fixed to the bottom of the screen while having only responses scrollable</p>	<p>Have the "View all Responses" fixed to the bottom of the screen while having only responses scrollable</p>
<p>On the home page, search bar placement is misleading, making teachers think they are searching for classes instead of students.</p>	<p>on first look, I thought that the search was to search for classes - but when I clicked, the student list came up. Nothing on the homepage told me that the search was for students</p>	<p>Clearly label the search bar as "Search Students" or add an icon to differentiate it from class-related searches.</p>	<p>Clearly label the search bar as "Search Students"</p>
<p>The placement of the edit button makes the function unclear and may lead to confusion.</p>	<p>UI elements need to be placed in intuitive locations that match user expectations. May be difficult for user to know that the edit button is used for</p>	<p>Move the "Edit" button? or just remove altogether. Not sure if there is a need to edit the student profile</p>	<p>We Disagree. We think it's important that the teacher can edit information.</p>
<p>It is unclear what the save, dismiss and alert options do</p>	<p>The user might not understand at first what these buttons do</p>	<p>Add documentation to explain what these buttons do</p>	<p>Add documentation in the Info button screen.</p>
<p>In the notifications page it is unclear where the notifications are coming from</p>	<p>It is unclear to the user where the notifications are coming from</p>	<p>Mention the source of the notifications. Maybe make them expandable with more information</p>	<p>Make notification bars expandable with more information</p>

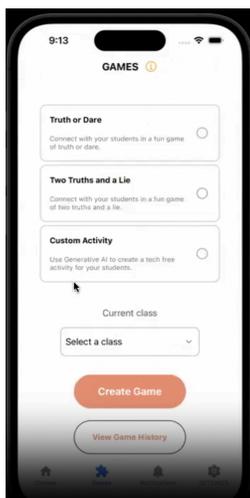
Not clear user needs to enter truth and dare	Users might think they can enter just one. Categorized as level 2 because it can impact usability if a user can't progress.	Have a text box telling users to enter one of each	Our button is not clickable until you entered both fields. There are existing text indicating for you to input text.
User has to remember truths and dare. Would be nice to one click copy + paste	Users might have a hard time navigating back and forth and would want to write down the dare or highlight and try to copy + paste	Make text click to copy for the suggestions	This is doable without us needing to implement anything.

### High Fidelity Prototype:

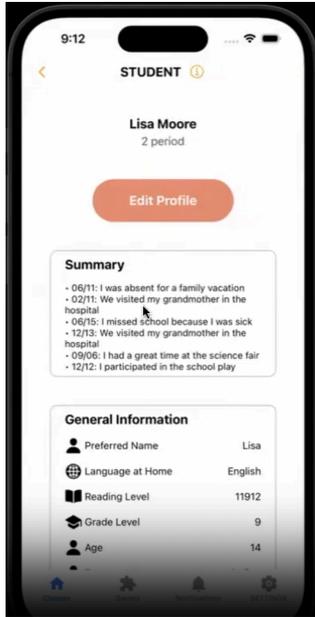
Some examples of changes that were made in the high fidelity prototype:



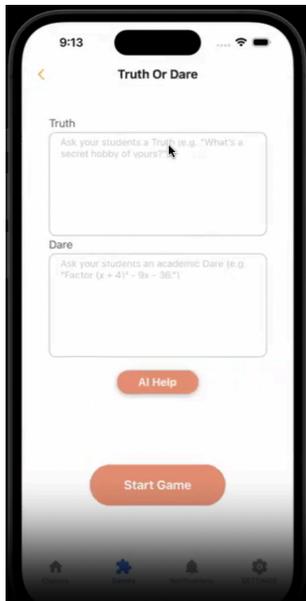
- Info button added to the home page.
- Search icon changed to “Find a Student”
- Additional information added to each class period card including class name



- “Start Game” button was changed to “Create Game”
- Only one of the three radio buttons can be selected at a time



- Dates were added to each individual response in the summary
- Unique icons were used for each aspect of the general information

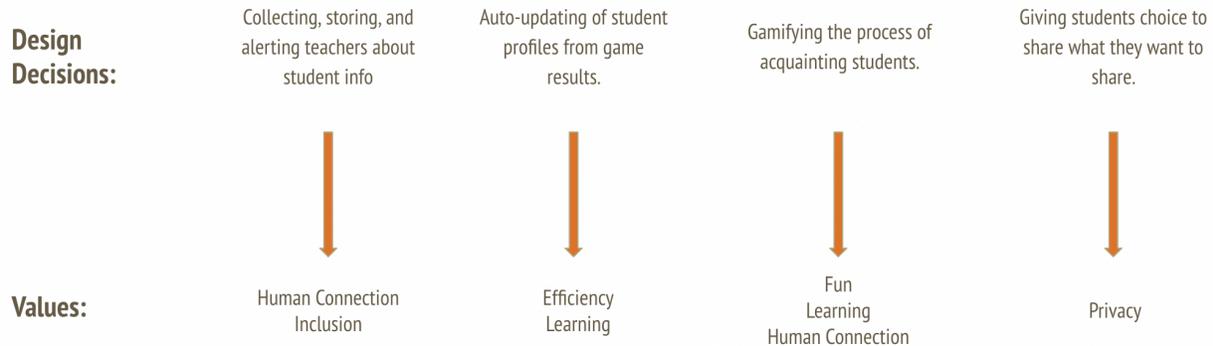


- Back button added
- Sample text added

## Values in design

EKG is guided by core values that shape its purpose and design, ensuring it serves as a meaningful tool for teachers and students alike. At its heart is human connection—the app is designed to foster stronger relationships between teachers and students by making it easier to understand and support individual needs. Inclusion is central to the experience, with features that respect diverse student backgrounds and

learning styles, ensuring every voice is valued. Privacy underpins all data interactions, safeguarding sensitive information and empowering users to share only what they're comfortable with. The app emphasizes efficiency by streamlining data collection and analysis, reducing teacher workload, and providing actionable insights. EKG also embraces learning and fun, transforming the process of getting to know students into an engaging experience that sparks curiosity and creativity. Together, these values ensure that EKG is not just a tool, but a platform that aligns with the goals and ethics of modern education.



Values in Tension	Explanation	How they are Addressed
Privacy vs Human Connection	Enabling teachers to share student information with each other improves their human connection but has the potential to invade their privacy.	By allowing teachers to control what information is shared we are trusting professionals to make the correct decision on a case-by-case basis.
Fun vs Efficiency	Gamifying the process requires significant time but improves enjoyment.	The process streamlines many things to save time but ultimately allows the teacher to determine how often to employ this tool.

## Final prototype implementation

### Tools Used

The front and back ends were developed using React Native. Using React Native for both the front and back end of a class project app offers the advantage of a unified JavaScript codebase, enabling cross-platform development for iOS and Android with shared code and access to a rich ecosystem of libraries. Tools like Expo streamline development and React Native's strong community including the 147L course provide abundant resources. This setup is ideal for learning full-stack development and completing small-scale projects efficiently. However, it may face performance limitations compared to native apps, dependency challenges with third-party libraries, and increased complexity when

implementing native functionality or handling complex back-end tasks. While React Native simplifies development for straightforward apps, it might not be optimal for performance-critical or highly intricate applications. Therefore it was quite suitable for our context.

The database was programmed in Supabase. Supabase is a powerful backend-as-a-service platform that simplifies app development by offering features like a hosted PostgreSQL database, authentication, real-time subscriptions, and built-in APIs, making it ideal for quickly building scalable applications. At the scale of this project it is also free. Its open-source nature, integration with modern frameworks, and minimal setup time are major advantages. However, it may not suit highly customized backends or apps requiring complex server-side logic, and relying on a third-party service can introduce limitations in flexibility and long-term cost concerns as your app scales. While excellent for rapid prototyping and straightforward projects, it may not meet the needs of advanced use cases requiring full backend control.

Google Cloud and more specifically Gemini were used for the AI functionality. Google Gemini, formerly known as Bard, is an AI chatbot developed by Google DeepMind, designed to generate human-like text for various applications, including answering queries and summarizing material. It offers high-quality text generation and integrates seamlessly with Google's ecosystem. It was also provided for free by the course instructors.

## Wizard of Oz Techniques

While we considered using Wizard of Oz techniques especially for the AI features, we were pleasantly surprised by the fact that we were able to successfully implement them.

## Hard-coded Techniques

Hard-coded techniques used for aspects of the system that would require student interaction and integration with other software. There were many reasons to avoid student interaction. We did not have easy access to multiple users to respond to items, we did not have time to develop another interface for students, and we did not wish to create the necessary networking between the two systems. As such, all users saw the same student responses to static truth or dare prompts regardless of what they entered. We also hard-coded a database of fake general information about students instead of integrating with another LMS system. This bypassed safety concerns and meant that we did not need to learn about and create code to network with third-party software applications.

# Reflection & next steps

## Reflection

This quarter offered a profound learning experience in design thinking, deeply enriching my understanding of human-centered design, the studio theme, and the development of our project.

### Design Thinking

We came to appreciate the iterative nature of design thinking, where every cycle of prototyping, testing, and refining brought us closer to creating a meaningful and impactful solution. Our focus on teachers' and students' needs reinforced the value of human-centered design, which prioritizes empathy and context over assumptions. By immersing ourselves in the realities of educators and learners, we were able to design EKG as a tool that addresses real challenges while respecting the diversity of educational experiences.

One of the key lessons was the importance of contextual inquiry. Observing and interviewing educators in their environments revealed insights that could never have been captured through abstract brainstorming alone. For example, the nuanced balance between maintaining student privacy and sharing actionable information illuminated a critical tension in education that our design had to navigate. Contextual inquiry helped us see that designing for education requires more than creating efficient workflows—it demands sensitivity to the emotional and relational dynamics of teaching and learning.

This sensitivity tied closely to the role of values in design. Our emphasis on human connection, inclusion, and transparency shaped every aspect of EKG. We realized that these values are not merely design principles but also the core of effective communication with users. They define how the product resonates with its audience and ensures trust, especially in the complex realm of education technology. For example, our commitment to transparency was particularly important when integrating AI into EKG. Teachers needed to trust how data was being used and analyzed, which reinforced the importance of making AI-powered insights explainable and user-driven.

### Studio Theme: AI in the Classroom

Reflecting on the broader potential of EdTech, we gained a deeper understanding of the field's remarkable ability to address a wide range of problems in education, from academic challenges to social-emotional development. Yet, this promise is often undermined by EdTech solutions that fail due to a lack of experience with real-world educational contexts. The overwhelming number of tools that fall short of expectations taught me the importance of designing with educators, not for them. Solutions must enhance, not disrupt, the deeply relational and practical aspects of teaching.

## Our Project: EKG

An eye-opening realization was the value of addressing non-academic aspects of education, such as fostering relationships, supporting mental health, and building a sense of community. These areas are often overlooked in favor of academic outcomes, yet they are critical to creating a holistic educational experience. Our project emphasized the importance of empowering teachers to connect with their students beyond grades and test scores, a perspective that is crucial for meaningful impact.

Through group work, we experienced firsthand the value of collaboration in driving creativity and refining ideas. Each team member brought unique perspectives and strengths, which enriched the process and helped us anticipate potential challenges. Additionally, the importance of meeting client expectations became clear. Designing for teachers required us to remain grounded in their goals and constraints, ensuring that EKG aligned with their practical needs while offering innovative solutions.

Finally, we learned the importance of maintaining humility in the classroom—both as a student and as a designer. Teachers should not be seen as infallible, nor should students. Instead, the goal should be mutual effort toward selfless future improvement. This mindset reinforced the idea that design is never truly finished; it is an ongoing process of learning, adapting, and growing. Overall, this quarter deepened my commitment to creating tools, resources, and knowledge that are empathetic, values-driven, and designed to empower those they serve.

## Next Steps

### Development Goals

Looking ahead, the development of EKG will focus on expanding its feature set to enhance its utility and adaptability in diverse educational contexts. One key goal is to implement functionality for duplicating activities across multiple classes, streamlining teacher workflows and making it easier to reuse successful strategies. Additionally, creating a repository of activities organized by domain will allow teachers to access a curated library of resources tailored to specific subjects or skills, fostering collaboration and innovation within the educator community. Another critical area of focus is leveraging AI to differentiate important knowledge within students' statements. By analyzing and prioritizing information shared by students, EKG can provide teachers with actionable insights that help them support students more effectively. These features will enhance the platform's ability to adapt to varied classroom needs, reducing teacher workload while promoting student-centered learning.

## Implementation Goals

To ensure EKG's successful adoption, we aim to build strategic design partnerships with teachers and students to roll out the tool incrementally. By collaborating directly with educators, we can co-design implementation strategies that align with classroom realities and priorities. Piloting the tool in select classrooms will allow us to gather feedback in real-time, iterating on its features and interface to address any challenges or unmet needs. Involving students in the rollout process will ensure that their privacy, concerns, and preferences are respected, fostering trust and enthusiasm for the tool. These partnerships will also help establish best practices for integrating EKG into existing workflows, minimizing disruption while maximizing impact. An incremental rollout approach will enable us to refine the tool through iterative cycles, ensuring that it delivers meaningful value to both teachers and students as it scales.