From Empathy to Execution: Designing User-Centered AI Digital Solutions Prototype
Scenario 1 – Digital GreenWall

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Stage 1 – Empathize & Define

1.1 Project overview and problem statement

Urban youth increasingly grow up in dense, concrete environments where daily contact with living nature is rare, fragmented, or entirely absent. Many students spend most of their time indoors, on screens, and in climate-controlled spaces, which weakens their emotional connection to ecosystems and makes sustainability feel abstract or distant. Digital GreenWall aims to use AI, gamification, and augmented reality to reconnect urban youth (ages 12–18) with plants and micro-green spaces in their immediate surroundings.

Problem statement:
How might we help urban youth who feel disconnected from nature to build meaningful, daily micro-interactions with plants and green spaces, using a digital solution that fits into their existing screen-based routines instead of competing with them?

1.2 Research approach and key findings (survey + interviews)

To understand this problem in context, a small mixed-method study was conducted using an online survey and short semi-structured interviews with classmates and peers living in high-density urban areas. The survey asked about current contact with nature, time spent outdoors, interest in plants, and preferences for digital engagement (games, challenges, AR, social features). The interviews explored emotions (stress, calm, boredom), barriers (“no time”, “no space”, “parents don’t allow soil mess”), and what would realistically motivate students to care for plants at home or in school.

Key patterns from the research included:

- Many students liked the *idea* of nature but felt they had “no space at home” and “no time to take care of plants”, so purely physical gardening programmes were not feasible for everyone.
- Participants associated plants and green views with calmness and stress relief, but did not know how to start or what plants to choose.

- Almost all respondents were comfortable with mobile games, streaks, and challenge systems, and said that a "small 5–10 minute daily challenge" felt achievable.
- Several students said they would feel more motivated if they could do activities as a group (class missions, house competitions) rather than alone.

These insights confirmed that the solution should combine **short, guided eco-missions**, **visual feedback** on impact, and **social/team elements**, delivered through a familiar mobile or web interface rather than requiring special hardware.

1.3 Persona and empathy map

Based on the research, a primary persona was created to guide all design decisions:

Persona: Aarav – "Stressed but scrolling"

- Age: 15, lives in a high-rise apartment with limited balcony space
- Context: Heavy academic pressure, spends 4–5 hours per day on screens (social media, YouTube, gaming)
- Goals: Wants to feel less stressed and more productive, but does not want "one more boring educational app"
- Frustrations: "No space for a garden", "Don't know which plants will survive", "Parents think plants are messy"
- Motivators: Short challenges, visible progress, friendly competition with friends, rewards/recognition at school

Empathy map (summary):

- Think & Feel: "Nature is nice, but gardening is for adults or people with time and space."
- See: Apartment blocks, traffic, school buildings; limited greenery except small parks.
- Say & Do: Says "I'm too busy"; scrolls social media for relaxation; likes filter effects and AR lenses.
- Hear: Parents and teachers talk about marks and exams more than mental health or nature.
- Pain: Stress, eye strain, boredom, lack of calm spaces.
- Gain: Wants a simple, non-judgmental way to feel calmer and to feel proud of small sustainable actions.

1.4 Early Eco-Avatar and growth concept

Early concept notes focused on an **Eco-Avatar** that visually represents the user's relationship with nature. The idea was that each real-world eco-action (watering a plant, opening a window for light, taking a photo of a local tree, completing a micro-mission) would feed and grow the avatar. If the user ignored nature for many days, the avatar would stagnate, look droopy, or retreat, creating a gentle emotional nudge without heavy guilt.

Initial ideas included:

- Different avatar types (fern, succulent, climber, flower) based on user preferences.
- Growth stages linked to streaks and completed missions (seed → sprout → small plant → mini-greenwall).
- Unlockable accessories (pots, trellises, lights) earned through eco-challenges instead of random loot.

These early notes framed Digital GreenWall as a **hybrid of a digital pet, a habit-building app, and a guided eco-mission system**, rather than just a static information dashboard.

Stage 2 – Ideate & Sketch

2.1 "How might we" questions and idea directions

Guided by the insights and persona, several "How might we" prompts were used during brainstorming:

- How might we turn tiny, realistic eco-actions into fun daily challenges that take less than 10 minutes?
- How might we use AR to overlay calming green experiences in small, cluttered rooms?
- How might we visualise a learner's "digital greenwall" progress over weeks and months?
- How might we use team missions and leaderboards to create positive peer pressure without shaming anyone?
- How might we combine AI recommendations with human choice so that users feel in control?

Idea generation sessions produced sticky notes, quick sketches, and mind maps exploring daily eco-challenges, AI-generated plant suggestions, AR overlays, avatar customisation, and school-wide missions.

2.2 Wireframes and low-fidelity sketches

For clarity, the early sketches were structured around the compulsory features in Scenario 1.

1. Daily Eco-Challenges screen

- Simple card showing today's challenge (e.g., "Open your window and notice 3 sounds from outside").
- Difficulty level and estimated time (5–10 minutes).
- "Start challenge" and "Mark as done" buttons, with a small progress ring showing streaks.
- Optional "Why this matters" text to tie each challenge to wellbeing or sustainability.

2. Real-World Eco Missions screen

- Map/list of missions that involve real actions (e.g., "Photograph a plant on your route to school", "Create a 3-pot mini-green corner at home").
- Filters (At home / At school / Outdoors) and difficulty.
- Mission details page describing steps, materials, and safety.

3. AR Nature Simulations screen/overlay

- Sketch of a camera view with an overlay of climbing plants or leaves on the user's bare wall.
- Basic controls: change plant type, intensity, time of day, ambient sounds.
- Button to "Save scene" as a short clip or screenshot.

4. Eco-Avatar screen

- Central avatar that visually grows as the user completes challenges.
- Bars or icons showing "Water", "Light", and "Care" levels mapped to behaviours (opening curtains, watering real plants, regular check-ins).
- Small badges beneath the avatar for completed milestones (e.g., "First Week Green", "Balcony Starter").

5. Progress Dashboard & Team Missions sketches

- Progress dashboard: line graph of streaks, count of completed challenges, time spent, CO_2/green space proxy metrics, and mood check-ins.
- Team missions: tiles for “Class GreenWall”, “House Challenge”, with combined scores and shared streaks.
- Leaderboard: top teams and individuals, but with focus on “personal best” and “improvement” to avoid shaming.

Low-fidelity drawings were captured on paper and then recreated as simple digital wireframes, which later guided the Figma prototype.

Stage 3 – Prototype & Interactions

3.1 Final screen designs

Using Figma (or [your design tool]), the low-fi sketches were transformed into a mid- to high-fidelity clickable prototype with a consistent visual style (soft greens, blues, and neutrals) and simple iconography.

Insert screenshots in your document here, for example:

- [Insert screenshot: Home screen with Daily Eco-Challenge card and Eco-Avatar preview]
- [Insert screenshot: Real-World Eco Missions list and mission detail]
- [Insert screenshot: AR Nature Simulation overlay on wall]
- [Insert screenshot: User Progress Dashboard]
- [Insert screenshot: Team Missions & Leaderboard]
- [Insert screenshot: Rewards & Recognition screen]

Each screen uses large, tappable buttons, clear headings, and minimal text to make the app usable on smaller phones and for younger teens.

3.2 Navigation and user flow

The core navigation is organised around a bottom tab bar with five main sections:

1. **Home (Daily Eco-Challenges)** – Default landing screen, shows today’s challenge, avatar status, and quick actions.
2. **AR Nature** – Launches AR experiences that overlay digital plants and calming nature scenes in the user’s real environment.

3. **Dashboard** – Visualises personal progress: completed challenges, streaks, time with nature, mood trends, and "digital greenwall" growth.
4. **Teams** – Contains team missions, class/house leaderboards, and collaborative goals (e.g., "Collectively nurture 100 plants this month").
5. **Rewards** – Shows badges, levels, certificates, and any school-recognised rewards for consistent engagement.

A typical user journey for Aarav:

- Opens app → Home tab shows today's eco-challenge and the current state of the Eco-Avatar.
- Taps "Start" → Reads simple instructions → Completes action and marks it done.
- Goes to AR tab → Points camera at wall → Tries 2–3 virtual greenwall overlays and saves a favourite scene.
- Visits Dashboard → Sees streak count and how many days of "green time" he has accumulated.
- Checks Teams → Notices his class is close to unlocking a new collective badge if everyone completes two more missions this week.
- Opens Rewards → Views new badge and printable certificate, which can be turned into house points or reflection evidence.

The prototype carefully connects all five compulsory features so that each action (challenge, AR session, mission) feeds into the avatar, dashboard, team progress, and rewards loop, supporting behaviour change instead of being a one-off game.

Stage 4 – Test, Reflect & Iterate

4.1 Test plan (who, what, how)

To validate the prototype, a short usability and concept test was conducted with [3–5] students from the target age group (13–17) who live in apartments or dense neighbourhoods. Participants used the Figma prototype on a phone or tablet while following a scripted set of tasks:

- Task 1: Understand the purpose of the app from the home screen.
- Task 2: Start and complete a Daily Eco-Challenge in the prototype.
- Task 3: Launch an AR nature simulation and change the scene.
- Task 4: Check their progress on the dashboard and interpret what it means.

- Task 5: Join or view a team mission and see how teams are ranked.

A think-aloud method was used so that participants verbalised their thoughts, and short follow-up questions were asked about motivation ("Would you actually do this?", "What feels boring or confusing?").

4.2 Key observations and sample quotes

Some key patterns from the test sessions:

- Most participants immediately understood that the app was "about nature" and "small eco tasks", but the connection between AR scenes and real-world missions needed extra explanation.
- The Eco-Avatar was described as "cute" and "motivating", especially when it visibly changed after completing a challenge.
- The AR feature generated excitement, but some users wanted more guidance ("What should I do with this?") and simpler controls.
- The dashboard graphs were clear for older participants, but younger users focused more on streaks and badges than on abstract metrics.
- Team missions and leaderboards increased motivation for competitive students, but a few participants worried about always "being at the bottom".

Example paraphrased quotes:

- "I like that the tasks are short; I can probably do this between homework."
- "The AR wall is cool, but I want it to tell me if I'm doing something right for real plants."
- "I would be more serious if my house points depended on this."
- "The graphs are okay, but I'm mainly looking at my streak and badges."

4.3 Concrete design changes (with before/after notes)

Based on the observations, the following design iterations were made:

- **Clarified AR purpose:**
    - Before: AR tab only showed decorative green overlays.
    - After: Added "Learn" mode that links each AR scene to a real plant type, care tips, and a suggested tiny action (e.g., "Try placing a real plant in this light condition").
- **Simplified AR controls:**

    - Before: Multiple sliders and options crowded the screen.
    - After: Reduced to 3 preset scenes (“Calm Corner”, “Jungle Wall”, “Sunrise Garden”) with one-tap switching.
- **Strengthened progress feedback for younger users:**
    - Before: Dashboard centred on line charts and numeric metrics.
    - After: Larger streak tracker, progress rings, and avatar animations to highlight short-term wins, with charts moved slightly lower.
- **Softened leaderboard pressure:**
    - Before: Single global leaderboard emphasising rank only.
    - After: Added “Personal Best” and “Improvement” indicators, and optional “anonymous mode” for shy users or classes that prefer cooperative goals.

In the document, you can add 1–2 small visuals such as:

- [Insert small before/after comparison of AR screen]
- [Insert small before/after comparison of dashboard or leaderboard]

Stage 5 – Final Prototype & Reflection

5.1 Summary of final solution

The final Digital GreenWall prototype is a user-centred AI-assisted platform that meets the Scenario 1 requirements by integrating Daily Eco-Challenges, AR nature simulations, a user progress dashboard, team missions with leaderboards, and a rewards system into one coherent experience. It is designed specifically for urban youth who are digitally fluent but nature-disconnected, and encourages micro-interactions with greenery that are realistic in small spaces and busy schedules.

Through short, guided missions and AR overlays, students can gradually build a “digital greenwall” that reflects both their virtual and real-world care for plants. The app creates a feedback loop in which AI-generated or curated challenges respond to user preferences and performance, while teams and rewards sustain long-term motivation.

5.2 Ethical and sustainability considerations

From an ethical perspective, the design avoids dark patterns and heavy guilt tactics. Users are not punished for missing days; instead, the avatar gently signals neglect and the app invites them to “restart” rather than shaming them. Data collection is minimised to what is necessary for tracking progress and team scores, with a clear

intention that any future implementation would follow school data-protection policies and require consent.

From a sustainability perspective, the app encourages **small, feasible actions** (e.g., caring for a single balcony plant, noticing street trees, reducing air-conditioning use slightly) rather than unrealistic demands. It recognises constraints such as limited space, family rules, and safety. The AR feature is framed as a bridge to real nature, not a replacement, to avoid the risk of "virtual nature" becoming an excuse to ignore real ecosystems.

5.3 Reflection on learning (UX, AI, behaviour change)

Working through Scenario 1 from empathy to execution provided practical experience with UX design, AI-assisted ideation, and behaviour change principles aligned with IB expectations that assessments should demonstrate process and reflection, not just final products.krmangalam

Key learning points:

- **UX:** Direct engagement with users (surveys, interviews, testing) showed that assumptions about what is "motivating" are often incomplete. Young people liked nature but needed structured guidance, gentle feedback, and social structures to turn interest into habits.
- **AI-assisted design:** Using AI as a co-designer (for brainstorming "How might we" questions, generating challenge ideas, or suggesting AR scenes) sped up ideation, but still required human judgement to align with context, ethics, and feasibility.
- **Behaviour change:** Behaviour change for sustainability works better when broken into small, trackable steps with immediate feedback, visible progress, and supportive social norms. The combination of Eco-Avatar, streaks, team missions, and rewards was consciously designed to build intrinsic motivation (feeling calmer, proud, more connected) rather than only extrinsic points.

Overall, this project demonstrated how a structured design process—Empathize, Define, Ideate, Prototype, Test, and Iterate—can be applied in a real educational context to create an AI-enabled digital solution that aims to shift everyday behaviour in a positive, sustainable direction.