Case Study: Addressing Dark UX Patterns in Duolingo for Ethical Engagement

Human-Computer Interaction (HCI) Project – Ethical UI/UX Design in Educational Applications

Submitted by:
Team Members -
Diksha Dutta (22BIT0230)
Lakshita Setia (22BIT0695)
Madhuvanthi (22BIT0103)

1. Target Community

- **Primary:** University students actively engaged in digital language learning, especially within the 18–24 age group.
- **Secondary:** Educators exploring gamified learning platforms, UX/UI designers working on educational apps, and HCI researchers analysing ethical engagement in gamification.
- **Survey Demographic Insight:** The majority of survey responses were collected from my batchmates, providing a concentrated yet relevant perspective from tech-savvy young adults who are mobile-first learners. Their experiences highlight both the motivational and manipulative aspects of Duolingo's design.

2. Abstract

This case study investigates common Dark UX patterns found in the Duolingo app, based on survey feedback from active and former users. The study identifies emotional manipulation, artificial scarcity, and information withholding as recurring themes, and proposes innovative, ethical design solutions to maintain engagement without manipulative tactics. The recommendations are rooted in HCI principles and user-centered design, prioritizing emotional well-being, fairness, and transparency.

3. Survey Methodology

- **Tool Used:** Google Forms.
- **Respondents:** 50+ participants, primarily university students from my batch.
- **Duration:** Conducted during August 2025.
- **Form Sections:**
  1. General Usage (frequency, duration, reason for using Duolingo).
  2. Experience & Motivation (streaks, emotions, in-app purchases).
  3. Design & Notifications (notifications, pop-ups, accidental purchases).
  4. Perceived Fairness (difficulty curve, paywall influence).
  5. Reflection (engagement style, recommended changes, willingness to recommend).

4. Survey Results & Statistics

Based on the **Google Form survey** conducted with 50+ respondents (mostly university students from my batch), the following trends were observed:
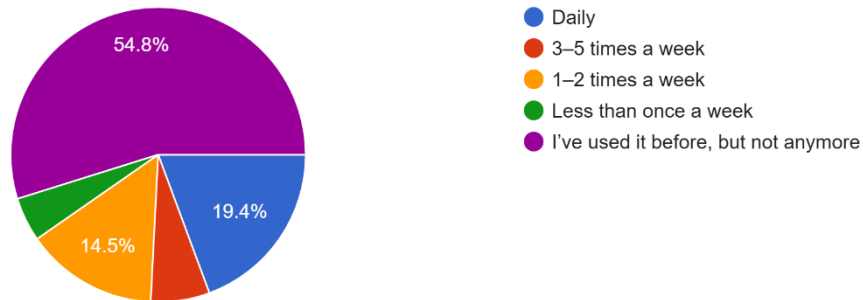
Usage Frequency
- About **40%** of respondents reported using Duolingo daily or several times a week.

- Nearly **50%** said they had used it before but eventually stopped, indicating issues with **long-term retention**.

Graph: *Pie chart showing frequency of Duolingo usage among respondents.*

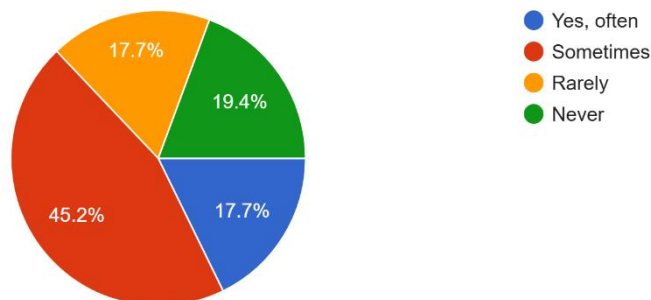Section 1 — General Usage 1. How often do you use Duolingo?
62 responses

54.8%
19.4%
14.5%

- Daily
- 3–5 times a week
- 1–2 times a week
- Less than once a week
- I've used it before, but not anymore

Streak Pressure

- Around **55%** admitted to feeling pressured or guilty when they missed a streak.
- Others said they were "neutral" or "did not care," but streak anxiety clearly influenced a significant portion.

Graph: *Pie chart comparing users who felt pressured by streaks vs. those who did not.*

Section 2 — Experience & Motivation 4. Have you ever felt pressured to maintain your streak?
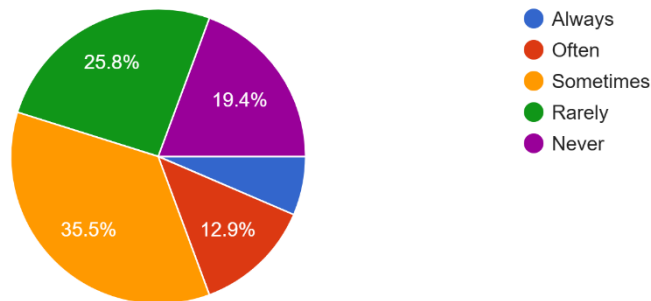62 responses

17.7%
19.4%
45.2%
17.7%

- Yes, often
- Sometimes
- Rarely
- Never

Notifications

- Nearly **60%** said notifications made them feel guilty or were too frequent.
- A smaller group (~20%) ignored them, while others described them as "cheerfully aggressive."

Graph: *Pie chart showing perception of Duolingo notifications (guilt-inducing vs. neutral/ignorable).*

Section 3 — Design & Notifications 7. How often do Duolingo notifications make you feel guilty for not practicing?

62 responses

- Always
- Often
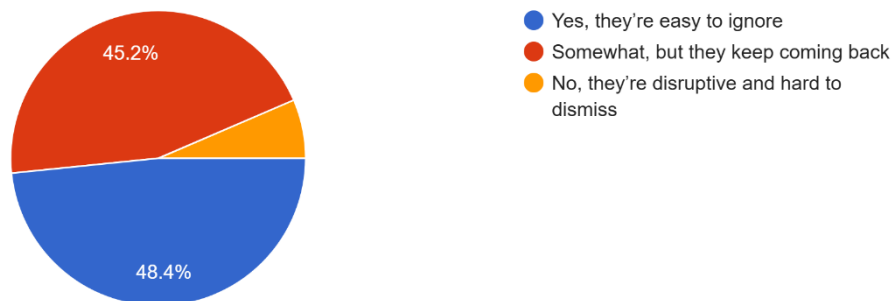- Sometimes
- Rarely
- Never

25.8%
19.4%
35.5%
12.9%

Ads & Premium Pushes

- About **70%** reported that subscription pop-ups and ads were disruptive or manipulative.
- Respondents noted that the constant interruptions broke learning flow.

Graph: *Pie chart showing user opinions on ads and subscription pop-ups.*

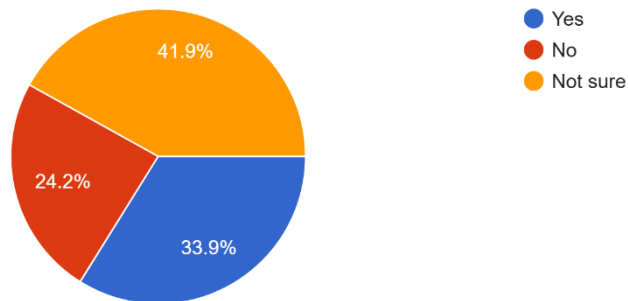8. Do you find it easy to dismiss pop-ups asking you to subscribe or buy features?

62 responses

- Yes, they're easy to ignore
- Somewhat, but they keep coming back
- No, they're disruptive and hard to dismiss

45.2%
48.4%

Repetitiveness of Lessons

- Around **50%** felt the app was **too repetitive**, with the same vocabulary recycled across lessons.
- Direct comments included: "boring," "not useful after a while," and "questions repeat too much."

Graph: *Pie chart on user feedback regarding lesson repetitiveness.*

12. Have you noticed lessons becoming harder or more repetitive when you don't have a subscription?

62 responses

- Yes
- No
- Not sure

41.9%
24.2%
33.9%

Open-Ended Responses:

Key recurring themes:

- **Hearts/Lives System:** Users felt restricted when mistakes depleted hearts.
- **Monotony:** Complaints about repeated vocabulary drills.
- **Ads/Pop-Ups:** Strong frustration with frequency.
- **Motivation vs. Guilt:** Mixed feelings about streaks and Duo mascot's tone.

Insight: Open responses deepen the quantitative data, confirming that **hearts and ads** are major pain points not fully captured in multiple-choice questions.

Overall Recommendation:

- **63%**: Yes
- **37%**: No

Insight: Although many would recommend Duolingo, it is often with **conditions** (e.g., good for beginners but manipulative, too many ads).

Yes it is a great application that gamifies learning. One of the most popular ones in the planet.

Yes because it is really fun and innovative experience to learn a new language

Yes very much. If a person is interested genuinely, it is a great tool.

Not so much

Not really. Doesn't tell much about grammar and sentence structure. Rather focuses on remembering words

I would have said no, but for now, this app is the only one which is mostly preferred. Maybe if it could improvise its functioning a bit, better reviews can be expected.

Yes I would recommend them if they want to learn new languages ..

yes i would. as it supports many languages and the UI is very engaging and game-like. it does not feel like studying. its fun and encourages you to learn regularly.

Yes, Its the only app for now that'll help you learn a new language in a playful way

yes it is a good app to learn a foreign language

Yes, its easy and interactive

Yes. It is beneficial to learn how to read and understand the language, but needs upgrade for in person conversation.
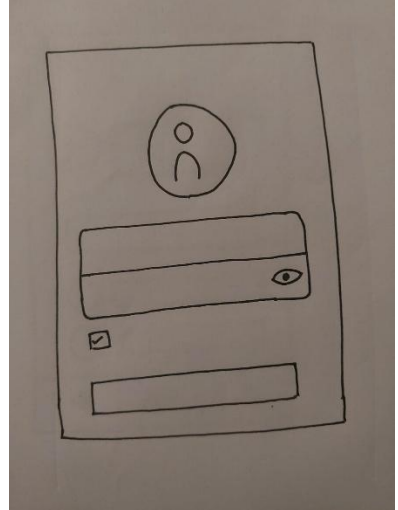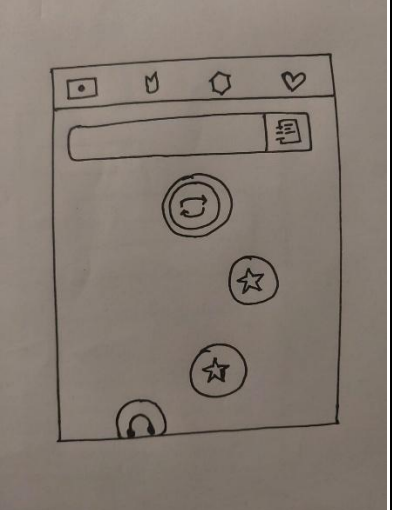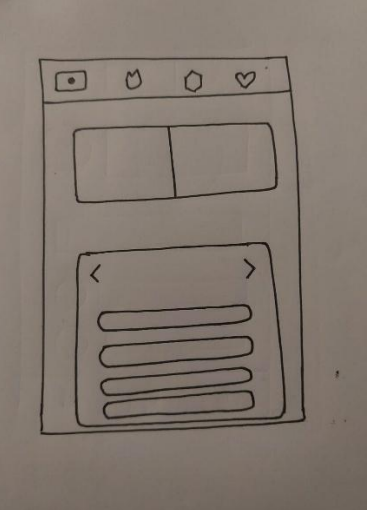
Mostly no, depending on the language of interest, the vastness of vocabulary varies, but I would recommend it to someone who's completely new to the language.

Nothing

Yes, but with a warning that the app uses manipulative streaks and notifications to keep you hooked.

5. Existing Product Interface
- **Core Mechanics:** Streaks, notifications, lessons, ads, premium prompts, hearts system.
- **UI Characteristics:** Bright colours, mascot reminders, gamified lesson tree, pop-ups for ads/premium.

Login	Learning Path	Monthwise Streak

6. Limitations Faced by Target Community

1. Guilt-Tripping Notifications
Notifications are phrased to emotionally pressure learners into maintaining streaks. Instead of motivating, they often induce guilt, creating a negative emotional association with learning.

2. Streak Obsession & Pay-to-Freeze Progress
Duolingo's streak system is central to its gamification. However, the streak freeze is often locked behind payment. This leads to anxiety when users miss a day, and many learners reported focusing more on keeping the streak alive than on genuine language acquisition.

3. Repetitive & Monotonous Lessons
Survey participants highlighted that vocabulary and sentence drills felt repetitive. With limited variation and cultural integration, lessons become monotonous, reducing engagement and long-term retention.

4. Overbearing Ads & Subscription Pushes
Free-plan users are subjected to frequent ads and pop-ups promoting the premium plan. These interruptions break the flow of learning and were described as frustrating and obstructive by most respondents.

5. Ambiguous Button Design
The interface design sometimes uses similar styles for "continue" and "buy premium" actions. This creates confusion and can lead to accidental purchases, particularly for budget-conscious students.

6. Unclear Learning Roadmap
Learners reported that they lacked clarity on their true progress. The current "lesson tree" design does not show how acquired skills map to global standards (such as CEFR levels). This creates uncertainty about language proficiency.

7. Hearts/Lives Restricting Learning
Duolingo uses a "hearts" system, where mistakes cost lives and learners are blocked from further practice unless they wait, watch ads, or pay. This artificial scarcity limits opportunities for practice and creates unnecessary frustration.

8. Limited Real-World Application
The app is restricted to its lesson ecosystem. Learners cannot easily practice language skills with real-world content such as signs, books, or menus, forcing them to rely on external tools like Google Translate.

9. Lack of Community Support
Learning is mostly solitary within Duolingo. There is no dedicated platform for asking questions, discussing grammar, or connecting with experienced speakers. This isolation reduces the social dimension of learning.

7. Suggested Solutions

1. Redesign Notifications
- Replace guilt-driven reminders with **positive reinforcement**.
- Provide learners with **control over tone and frequency** of notifications.

- Introduce more **friendly and supportive mascot interactions** instead of shaming language.

2. Improve Streak System

- Introduce a **free progress pause** (e.g., once per month).
- Reward long-term learners with **milestone-based free streak insurance**.
- Replace paid streak recovery with **challenge-based recovery tasks**.

3. Diversify Lessons

- Implement **Adaptive Spaced Repetition** to personalize review cycles.
- Add **branching lesson paths** (e.g., culture, grammar, real conversations).
- Include **interactive content** such as cultural notes, idioms, and roleplay scenarios.

4. Control Ads & Premium Pushes

- Cap ad frequency to avoid cognitive overload.
- Display ads only at **logical breaks** (after lessons, not mid-exercise).
- Introduce a **"Do Not Disturb Study Mode"** where ads are delayed until after study sessions.

5. Clarify Button Design

- Use **distinct color coding, icons, and placement** to separate learning actions from premium actions.
- Add a **confirmation step** before purchases.
- Provide an **optional spending lock** in settings to protect budget-conscious learners.

6. Transparent Roadmap

- Align the lesson structure with **CEFR levels (A1–C2)** for clarity.
- Provide a **syllabus preview** of upcoming skills.
- Show **goal-based tracking** (e.g., "You have mastered 60% of A2 vocabulary").

7. Revamp Hearts/Lives System

- Offer **unlimited practice mode** without heart restrictions.
- Allow users to **earn hearts** by completing challenges or reviews.
- Introduce **difficulty-based rewards** for tackling harder lessons.

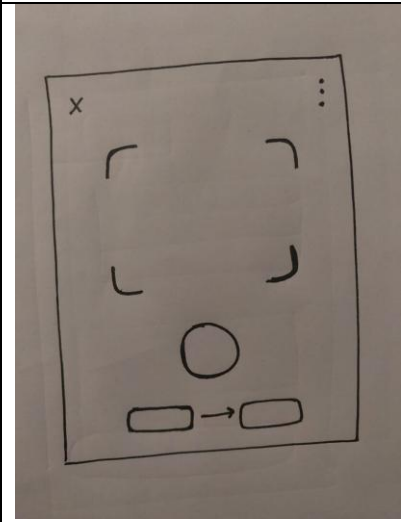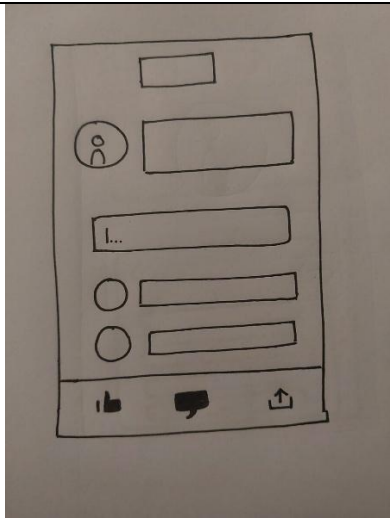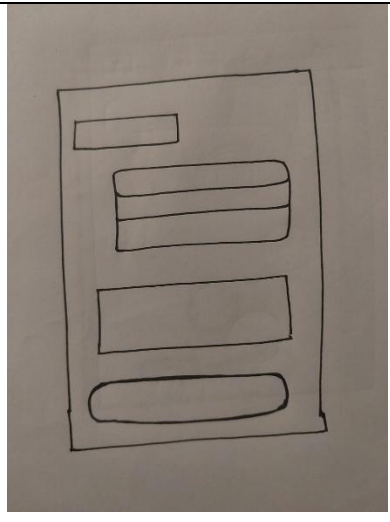**8. Add Text-Scan Translation Feature**

- Integrate an **OCR (Optical Character Recognition) scanner** for translating real-world texts like menus, books, or signs.
- Provide **tap-to-hear pronunciation** and **grammar notes** for scanned words.
- Gamify it: award **XP points** for practicing with scanned text, bridging lessons and real life.

9. Introduce Q&A Platform

- Add an in-app **Q&A forum** for collaborative learning.
- Use **upvoting** to highlight the best responses.
- Include **topic tags** (e.g., Grammar, Pronunciation, Culture).
- Recognize native speakers and experts with **badges or verification**.

Design Alternatives:

Text Translation	QnA	Grammar Section

8. Expected Impact

The proposed redesign strategies will make Duolingo a more ethical and user-friendly platform while retaining its gamified appeal. By addressing manipulative streak mechanics, lesson monotony, aggressive upselling, and artificial scarcity, the platform will promote healthier engagement, build trust, and ensure that learners remain motivated for the right reasons.

9. Sources

Primary Data:

- Survey responses collected via Google Forms from batchmates (August 2025).
  Google Form Response

Secondary References:

- Gray, C.M., Kou, Y., Battles, B., Hoggatt, J., & Toombs, A. (2018). *The Dark (Patterns) Side of UX Design*.
- Nielsen, J. (1995). *10 Usability Heuristics for User Interface Design*. Nielsen Norman Group.
- Duolingo app (observational analysis, 2025)