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Project Prototype - DoEarMi

Need Finding

Survey

Our app is meant to be geared toward beginner and intermediate musicians and music students seeking ear training. We created and sent out a survey to better understand the needs of these potential users. The survey was posted on the music section of Craigslist, on the Musician Hub @ WWU Discord server, on the WWU Music Theory Discord server, and sent directly to several of our musician friends. We received six responses. The questions and responses were as follows:

1. What is your level of experience with music theory? (6 responses)
 - 33.3% *Beginner*
 - 33.3% *Intermediate*
 - 16.7% *Advanced*
 - 16.7% *Expert*
2. What would be the most useful app/tool to develop your musical skills? (6 responses)
 - "Interval and chord training"*
 - "A tool to help organize my practice and help build a practice routine"*
 - "Quizzing on noted and/or chord progressions"*
 - "Dictation at least in multiple voices"*
 - "Anki? I have never really used tools to assist in my musical training- just physical practice"*
 - "Aural skills app"*
3. What device would you prefer to use for ear training? (6 responses)
 - 33.3% *Mobile*
 - 16.7% *Desktop*
 - 50% *Both*
4. Have you used an app for ear training before? (6 responses)
 - 33.3% *Yes*
 - 66.7% *No*
5. If you answered yes to the previous question, which apps have you used? (2 responses)
 - "FET"*
 - "musictheory.net"*
6. If you have used any ear training apps before, was there anything you disliked about them? (2 responses)
 - "No melodic dictation, not free/expensive, no intro to chord prog"*
 - "Limited customizability, didn't tell me how I was doing, I was in charge of organizing my practice around it"*

7. If you have used any ear training apps before, was there anything in particular you liked about them? (2 responses)
 - "Game levels"*
 - "I liked the basic interval tests and dominant inversion tests"*
8. How much time per week do you spend ear training? (6 responses)
 - 66.7% Almost never
 - 16.7% Every other day
 - 16.7% Other: *"Hours a day when I started, now usually an hour or two a week"*
9. What types of ear training are you most interested in? Select multiple if needed. (6 responses)
 - 33.3% Scale Degrees
 - 33.3% Melodic Dictation
 - 66.7% Intervals
 - 100% Chords
10. Any other thoughts? (2 responses)
 - "A feature that gives you multiple progression options and lets you choose which one sounds best (+ inform what that chord was). Something interactive that lets you apply your musical ear"*
 - "This is a great idea, I think it would also be important to make sure the app or website is super accessible as that's also an issue with the few I've used in the past. I'd also add rhythmic dictation as a separate exercise from melody. ideally there's a rhythmic exercise, a note transcription exercise (no rhythm just a quarter note melody), and then one that combines them. It would also be cool to introduce an exercise where you are given a 4 bar progression and need to do functional analysis."*

Takeaways

Given the responses we were able to collect, we were able to determine important features for our app. Two-thirds of the responses came from people who self-identified as having beginner/intermediate experience with music theory, which reaffirmed our decision to gear the application towards beginner and intermediate musicians. Considering most responses came from people who had never used an ear training app before, we will make the UI of the app as beginner friendly as possible with clear buttons, familiar navigation to other mobile apps, descriptions of ear training content, and foundational concepts incorporated into lessons.

The two responses about which previous ear training apps people had used in the past came from one mobile user and one desktop user. We had planned for DoEarMi to be a mobile app, but after seeing the desire for both desktop and mobile we plan to make both options available. We will focus on mobile, but we can scale the UI and support mouse and keyboard interactions to fit the desktop environment.

The two people who had used ear training apps previously expressed their desire for a customizable, free app with gamified aspects. To meet these needs, we will include the ability to customize user profiles and practice sessions with profile icons and multiple instruments respectively. The decision to include multiple instruments was also informed by reading user

reviews for similar ear training apps, as most other apps currently lack that option. We will tie customization into the gamified components of DoEarMi by making icons and instruments available for purchase with credits in the DoEarMi shop. Credits will be earned by completing ear training practice sessions and daily challenges. There will not be an option to buy credits with real-world currency, as we want this app to be completely free and to encourage users to continue their ear training. To further motivate users in their ear training journey and to include more game-like aspects, we will include a leaderboard of users based on their earned XP from practice sessions and offer rewards to those who place in the top.

Most of the responses for what kinds of apps would be most helpful included apps with music exercises like ear training. We had planned for the main focus of DoEarMi to be on scale degrees, but 100% of responses demonstrated a desire for chords and 66% demonstrated a desire for intervals while only 33% demonstrated a desire for scale degrees. We now plan to include scale degrees, intervals, chords, and melodic dictation exercises in DoEarMi. We will include foundational lessons for each of these concepts to ease users into the practice environment. We will provide multiple forms of feedback during and after each lesson to help users know how they're doing, as one survey response said other apps lacked that. There will be auditory, visual, and written feedback to let users know what they are getting correct or incorrect.

HTA

1. User Information

a. Log-in to account menu

- i. Username and password input fields
- ii. "Remember Me" option
- iii. Launch practice main menu on successful log-in
- iv. Create an account option
 1. Enter and confirm email
 2. Enter username
 3. Enter and confirm password
 4. Launch practice main menu on successful creation

b. User profile settings

- i. Profile information
 1. Display username
 2. Display profile icon
 3. Display XP
 4. Display available credits
 5. Display consistency streak
- ii. User Preferences
 1. Change password option
 2. Change icon
 - a. Display purchased icons
 - b. Select desired icon

- c. Update icon everywhere
 - iii. Instrument preferences
 - 1. Select one or many
 - a. Display purchased and default instruments
 - b. Add selected instrument(s) to audio output options backend
 - iv. Delete account option
- 2. Ear Training Lessons
 - a. Lessons main menu
 - i. Button for each lesson (launches lesson session in new screen)
 - ii. Description of each lesson
 - b. Specific lesson session
 - i. Text fields with relevant lesson information (e.g. chord type for intro to chords)
 - ii. Output audio
 - 1. Play default audio
 - 2. Volume control
 - 3. Replay Button
 - iii. Next lesson page button
- 3. Ear Training Practice
 - a. Practice Main Menu
 - i. Button for each practice type (launches practice session in new screen based on current user level)
 - ii. Description of each practice type
 - iii. Button for Daily Challenge
 - 1. Unclickable upon completion
 - b. Specific Practice Session
 - i. Output audio
 - 1. Play audio based on user selected instruments
 - 2. Volume control
 - 3. Replay button
 - ii. User input answer
 - 1. Written response practice sessions (e.g. melodic dictation)
 - a. Do Re Mi... buttons corresponding to note audio
 - b. Backspace option
 - c. Submit answer button
 - 2. Multiple choice practice sessions (e.g. chords)
 - a. Buttons corresponding to each answer choice
 - iii. Question correctness feedback
 - 1. Auditory feedback
 - 2. Color feedback
 - 3. Visual symbol feedback (e.g. check mark)

- iv. Progress bar for session completion percentage
 - 1. Update at each new question
- Repeat i-iv for each question in practice session
- v. Session completion
 - 1. Display score
 - 2. XP added to user profile
 - a. Update leaderboard position
 - 3. Credits added to user profile
 - 4. Update user streak if first session of day
 - 5. Retry option button (not available for daily challenges)
- c. Ear Training Daily Challenges
 - i. Daily challenge session (users get one attempt at challenge session)
 - 1. Pseudo-randomized challenge based on users completed lessons (e.g. scale degrees with 3 notes if they have only completed intro to scale degrees)
 - ii. Same requirements as "Specific Practice Session" i-v (see above)
- 4. Leaderboard
 - a. Display top 20 users in randomly selected group ranked by XP
 - i. Display if user is in the top 5 users currently
 - b. Display end of week long leaderboard
 - i. Display top 5 winning users
 - ii. Display prizes for competing
 - iii. Default back to leaderboard entry screen (complete lessons and/or practice sessions to enter leaderboard)
- 5. Shop
 - a. Display purchase options (purchased with in-app earned credits)
 - i. XP boosters
 - 1. Display XP boost icons with name and credits cost
 - 2. Limit time for XP boost (e.g. 2x XP for next hour)
 - 3. Update backend XP calculation function
 - 4. Reset XP calculation function after time expires
 - ii. Profile Icons
 - 1. Display unpurchased icons with credits cost
 - 2. Select icon to purchase
 - 3. Update user icon collection
 - 4. Update unpurchased icon collection
 - iii. Instruments
 - 1. Display unpurchased instrument icon with name and credits cost
 - 2. Output sample audio on click
 - 3. Select instrument to purchase
 - 4. Update user instrument collection
 - 5. Update unpurchased instrument collection

6. General Overlays

a. Headerbar

- i. Display menu name
- ii. Profile icon button
 1. Switch to profile menu on click
- iii. X out of session button (available on all session screens)
 1. Return to previous menu on click (e.g. lessons menu)
- iv. Shop icon button (available on main menus)
 1. Switch to shop menu on click

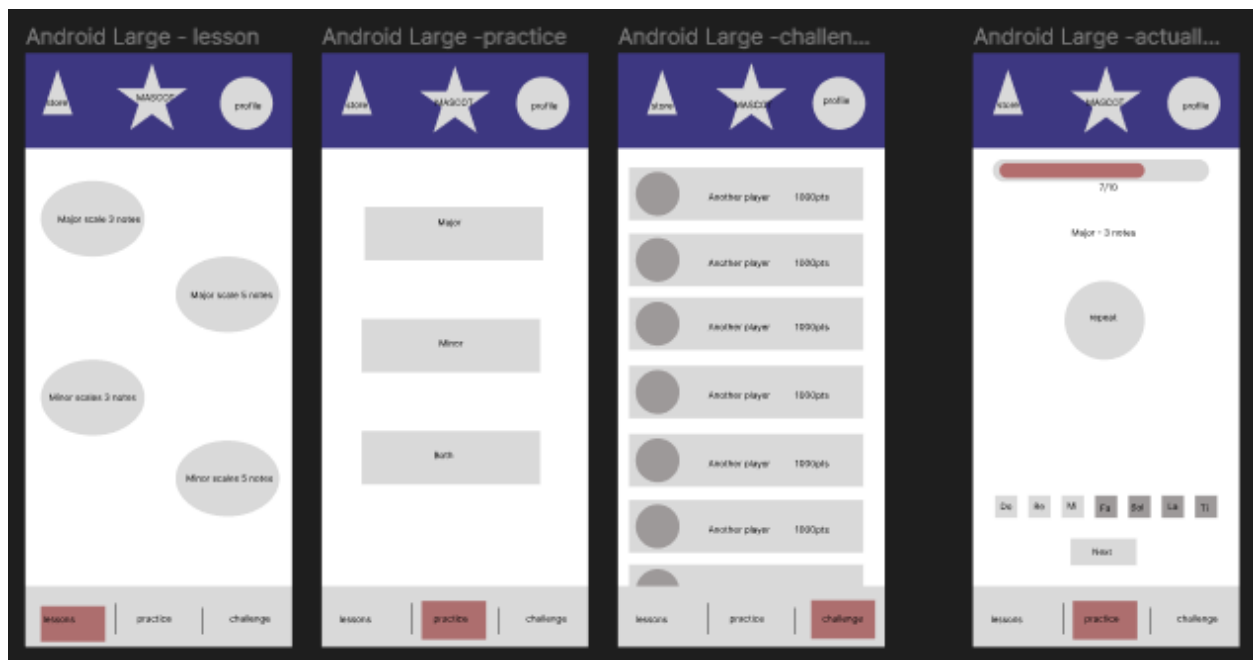
b. Bottom Navigation Bar (available on main menus)

- i. Lessons button
 1. Switch to lessons menu on click
- ii. Practice button
 1. Switch to practice menu on click
- iii. Leaderboard button
 1. Switch to leaderboard on click
- iv. Highlight current menu
- v. Disable click for current menu

Prototype Development

Version 1

Initially we dropped in some preconceived ideas from our initial proposal and certain ideas from our relevant apps like Duolingo and Earpeggio. Version 1 is what resulted from this brainstorming.



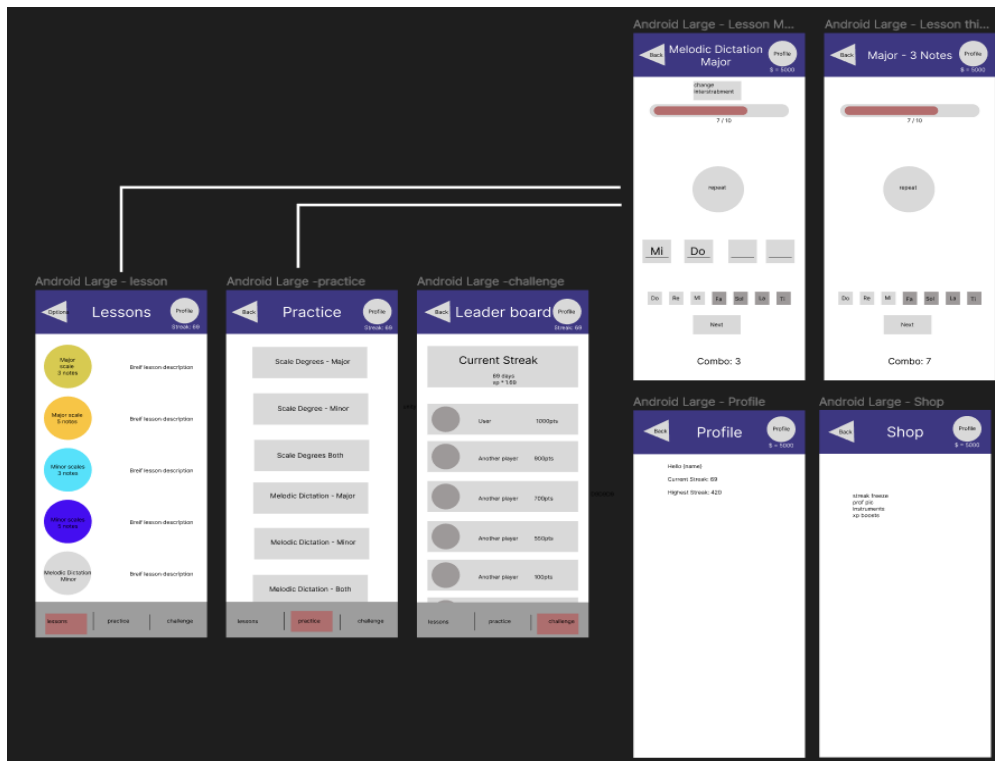
Version 2 and Version 3

Version 2 and 3 refined some of our ideas while also introducing some new ones. We tried changing the navigation bar on the bottom to a dedicated page and started to think about currency and shop functionality. We also worked with the placement and design of the lessons between version 2 and 3.



Version 4

For version 4 we started to wrap up exploration and refine what options worked best for our app. We had a couple responses on our survey at this point, and incorporated that feedback into clarifying and simplifying our menus. The lessons page got another redesign and some concepts for the profile and shop are developed. The challenge page is redeveloped to a leaderboard system to make the app less complicated.



Version 5

With version 5 we started from scratch designing a more clean user interface, while polishing what we had in version 4. This step focused on designing the details that were brushed aside in previous iterations. For example, the profile and shop design and features got filled in, and a distinction was made between lessons and practice. As we were working on this step, we were getting feedback from our survey and added chords and intervals to go along with scale degrees and melodic dictation. The lessons were changed to include more foundational concepts, as many survey responses came from beginners and those who have never used an ear training app.

Click around the prototype [here](#).



The practice menu is kept simple with just a button for each practice type and the daily challenge button at the top. The daily challenge is highlighted in a different color to show the user that it has not yet been completed and distinguish it from regular practice sessions. In the prototype, practice sessions open to a partially completed practice, where a green highlighted button is meant to demonstrate what a user would see when answering a question correctly

mid-session. The play button in all practice sessions has rings around it, that in a more developed version would be animated, to provide visual feedback that audio is playing. We chose to keep practice question pages very simple, with only what was necessary to complete the question and progress. This allows users to focus more on what they are hearing rather than what they are seeing. We also chose to not include a 'next' button after each question, and instead plan on automatically switching to the next question after a user inputs their answer and receives the visual/auditory feedback. This will keep practice sessions moving more quickly and avoid tedious button clicking.

The lessons main menu was kept simple with a slight change in design from the practice menu to distinguish them. Given that lessons are all very similar, we created a partial "Intro to Chords" lesson to demonstrate how a lesson works and what it looks like. The highlighted play button and corresponding audio name is meant to demonstrate the visual feedback a user would see when playing that sound, so they can be sure of what is playing. Lessons are meant to go at a slower pace than practice sessions, so here we do include a 'next' button for users to switch to the next lesson page at their own pace.

Our shop's main page is meant to be simple and show the three kinds of items available for purchase with in-app earned credits. We chose to put users' total credits in the header bar, where the profile icon typically appears, to help distinguish between user credits and item prices. We include a 'see more' button for icons and instruments for users who want to view all available options, and avoid overwhelming users by having too many purchase options on the shop's main page.

The user profile is meant to help users keep track of earned XP, credits, and practice streaks, so those stats are displayed visibly at the top. Credits are shown in the header bar to be consistent with how they appear in the shop. The profile is also where users can meet their customization desires, with the ability to change username, icon, and instruments. We include visual symbols like the pencil icon, commonly used in many apps, to show users that they can change these parts of their profile at any time.

Our leaderboard is designed to encourage users to keep practicing their ear training skills. We chose to include the icons and usernames of all users ranking on the leaderboard, as this allows users to show off their icon which require several practice sessions of earning credits to acquire. Highlighting where users rank and displaying the exact amount of XP everyone has allows users to see how many practice sessions they are away from a top ranking. Reminding users at the top of the page that those who rank in the top receive a reward is also meant to keep motivating them to train.

For this prototype, we wanted to have functionality of our main buttons to get an understanding of how it would feel to navigate the app. We included everything we felt we needed to convey the core goals and structure of our app. We did not include pages that felt superfluous for this prototype to the main structure of our app (i.e. create an account page, all icons/instruments page, edit icon/instrument pop-up window).