

Mediterranean Kids – Educational Nutrition App

Team: Andreas Solomou · Andreas Michael · Panayiotis Marquez Charalambous

2025-12-16

Abstract

We present a bilingual (English/Greek) educational mobile application for children aged 4–7 to learn the Mediterranean Food Pyramid. Built with Expo SDK 54 (React Native 0.81.5, React 19.x), the app provides an offline-first Learn section (4 levels), a multiple-choice Quiz with a post-quiz review screen, and an integrated learning mini-game via WebView (mobile) and iframe (web). Key design choices include large fonts, high contrast, big buttons, and minimal text. Local persistence via AsyncStorage stores level unlocking and high scores. We outline requirements, architecture, implementation details, a lightweight evaluation, and future work such as audio narration and additional games.

1. Introduction & Problem Definition

Nutrition education for early learners can be confusing without age-appropriate content and localized language support. Our objective is to deliver a simple, kid-friendly application that teaches the Mediterranean Food Pyramid using short interactions—learn, quiz, and play—available in English and Greek.

Stakeholders: children (4–7), parents/teachers, schools.

Goals: bilingual UI, offline reliability for Learn content, quick feedback loops, and seamless game integration.

2. Literature Review & State of the Art

Related work spans kids' nutrition apps and serious games for health. Many solutions lack bilingual content, offline-first design, or transparent assessment with review. Our app addresses these gaps by combining structured Learn levels with a fair Quiz (no pre-reveal of correctness) and a lightweight embedded game.

3. Requirements Analysis

Functional requirements (user stories):

- Browse 4 Learn levels with big text, emojis, and examples.
- Take a 10-question multiple-choice Quiz with progress and high score.
- Review mistakes after finishing the Quiz (show only wrong/all).

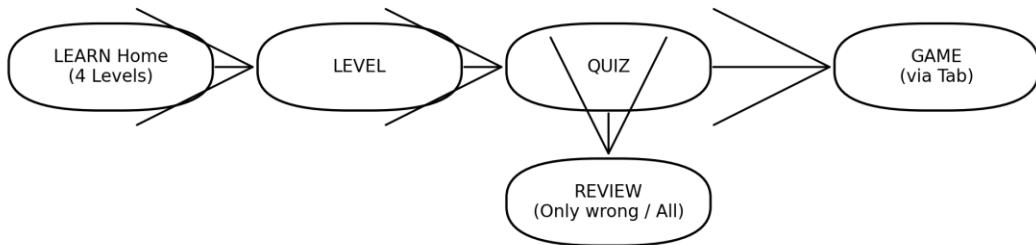
- Switch language EN \rightleftarrows GR; the choice persists.
- Play an embedded learning mini-game inside the app.

Non-functional requirements:

- Offline-first for Learn content.
- Fast startup; high contrast; large touch targets.
- Privacy-by-design (no PII).

4. System Design & Architecture

Stack: Expo SDK 54; React Native 0.81.5; React Navigation v6 (Bottom Tabs: Learn | Quiz | Game; Learn has a Stack). AsyncStorage stores unlocked levels and high scores. WebView integrates the game on mobile; an iframe fallback supports the web build. Custom LocaleProvider with LangSwitch supports i18n (EN/GR) across screens.



5. Implementation

- LocaleProvider & LangSwitch: persisted language toggle (EN/GR).
- Learn: 4 levels with group names, Greek examples, and kid notes; unlock progression; Vimeo link for video.
- Quiz: neutral option selection; progress bar; high score; post-quiz review (only wrong/all); bilingual questions.
- Game: WebView (iOS/Android) and iframe (web) for <https://cerino-games.eu/game.html>.
- Config & fixes: icons/splash placeholders; removed stray DefaultTheme usage; aligned dependencies.

[FIGURE C – UI screenshots montage (Learn, Level, Quiz, Review, Game) – Insert here]

6. Evaluation & Testing

Manual tests on Expo Go (Android/iOS).

Key test cases:

ID	Scenario	Steps / Expected	Result
T1	Unlock flow	Complete Level 1 → Level 2 unlocks	Pass
T2	Quiz scoring	Select answers → points on Next only	Pass
T3	Review screen	Finish quiz → see wrong answers	Pass
T4	Language switch	Toggle EN/GR → persists on reload	Pass
T5	Game loads	Open Game tab → game visible & playable	Pass
T6	Web build	Run on web → iframe fallback works	Pass

7. Discussion

The app met core goals: bilingual content, fair assessment, and a simple play loop. Trade-offs include reliance on an external game host and the absence of analytics or user accounts to keep privacy simple.

8. Conclusions & Future Work

We delivered a working, kid-friendly mobile app that teaches the Mediterranean diet via Learn, Quiz, and Game. Future improvements: more mini-games and characters, a teacher/parent mode and accessibility upgrades

9. Ethical, Legal & Data Protection (Optional)

The app collects no personal data (no login, no analytics). Links to external content (video/game) are used judiciously; Learn content is offline to ensure reliability and privacy. If future telemetry is added, consent and data minimization will be enforced in line with GDPR.

References

- [1] Expo. React Native for Everyone.
- [2] React Navigation v6.
- [3] Mediterranean Diet Pyramid resources.

[4] Vimeo – Mediterranean Diet for Kids.

[5] cerino-games.eu – Learning game.

Appendix A – Screenshots

The screenshots show three levels of a learning game:

- Level 1 – Καθημερινά (βάση)**: Describes the diet as healthy and energizing, with fruits and vegetables as the base. It includes a note about whole grains.
- Level 2 – Καθημερινά (πράσινη ζώνη)**: Describes the diet as colorful and includes a note about whole grains.
- Level 3 – 2–3 φορές την εβδομάδα**: Describes the diet as colorful and includes a note about whole grains.

Each level has a description, a note about whole grains, and a progress bar at the bottom.

The screenshots show a quiz and results screen:

- Kouīz**: A quiz titled "Ποια επίπεδα είναι «Καθημερινά» τρόφιμα;" with options A, B, and C. Option A is correct (green checkmark), B is incorrect (red X), and C is neutral (grey). The score is 0/10.
- Αποτελέσματα**: Shows the score 3/10 and the correct answer (A) highlighted in green.

Both screens include a progress bar at the bottom.

