TogetherWe

Executive Summary

TogetherWe is a framework-free, privacy-first web game that transforms two evidence-based mood helpers—**laughter** and **movement**—into playful, 10-second challenges. It runs entirely in the browser (no installs, no backend), processes all sensor data on-device, and stores scores locally. The experience is designed as a **positive interruption** that can lift mood in the moment while normalizing conversations about mental health in **Vietnam** and **Australia**, where 12-month prevalence of mental health problems is high and access to care is uneven. (qcmhr.org)

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1) Introduction

TogetherWe provides two quick game modes—**Laugh** (microphone + on-device audio classification) and **Shake** (phone motion sensors)—each scored, animated, and saved to a personal, local leaderboard. The guiding philosophy is to offer **micro-boosts** that are easy to start, safe to repeat, and respectful of privacy. There is no user account, no analytics collection, and no network calls other than public CDNs for model files.

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2) Motivation: Why Vietnam & Australia, why now?

- **Vietnam (youth):** The **Viet Nam Adolescent Mental Health Survey (V-NAMHS, 2023)** found that **1 in 5 adolescents (21.7%)** reported a mental health problem in the past 12 months; **anxiety 18.6%**, **depression 4.3%**. Only **8.4%** of those with a problem accessed support or counseling, revealing large treatment gaps and persistent stigma. (qcmhr.org)
  UNICEF echoed these gaps in 2024 communications to the public. (UNICEF)
- **Australia (adults):** The **Australian Institute of Health and Welfare (AIHW)** and **ABS** report that in **2020–2022**, **1 in 5 Australians (≈22%)** experienced a 12-month mental disorder; **17% anxiety**, **8% affective disorders**. (AIHW)

These figures underline the need for **low-barrier, high-reach tools** that reduce shame, spark conversation, and encourage self-care—especially for those unlikely to seek clinical services quickly.

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3) Evidence base: Why laughter and movement?

Laughter → stress down, mood up.
A 2019 meta-analysis of randomized trials concluded that **laughter/humor interventions reduce depression and anxiety** in adults (with varying study quality and calls for more RCTs). ([PubMed](#))
Physiologically, laughter is associated with reductions in stress biology (e.g., cortisol) and shifts toward parasympathetic activity, consistent with acute relief from tension (representative reviews summarized in the clinical literature). ([PMC](#))

Movement → a scalable antidepressant with acute benefits.
A 2023 umbrella review (Br J Sports Med) across diverse populations found **physical activity is highly beneficial for improving symptoms of depression, anxiety, and distress**. ([British Journal of Sports Medicine](#))
A 2024 BMJ systematic review shows **exercise has moderate effects** vs. controls for depression, reinforcing its role as a first-line adjunct. ([BMJ](#))
Crucially for TogetherWe's 10-second design, contemporary evidence shows **short, vigorous bursts** embedded in daily life (VILPA) are linked to meaningful health benefits, supporting the idea that **tiny, frequent efforts matter**. ([Nature](#))

Interpretation for game design: Even brief, playful sessions of laughter and movement can produce **immediate affective lift** and help build **self-efficacy** for mood-supportive habits, aligning with TogetherWe's "micro-boost" premise. ([PMC](#))

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4) Concept & Social-Impact Framing

Goal: destigmatize and de-intimidate mood-supportive behaviors by turning them into a **10-second game** that anyone can try, anywhere, without accounts or downloads.

How TogetherWe helps:

1. **Positive interruption:** A quick, low-friction action (laugh or shake) interrupts rumination and nudges the body toward a lighter state. ([PMC](#))
2. **Replayability:** Scores, personal bests, and celebratory effects build **habit loops**—useful where service access is limited (Vietnam) or demand is high (Australia). ([qcmhr.org](#))
3. **Awareness:** The About page shows concise, cited stats for Vietnam & Australia, normalizing discussion and prompting help-seeking where needed. ([qcmhr.org](#))
4. **Ethical technology:** All sensing and scoring are **on-device**; nothing leaves the browser. This is both safer and trust-building.

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5) Game Design & Mechanics

Shared loop (both modes)

- **Controls:** `Start 10s`, `Stop`, `Play Again`; live status; compact "Secure/Origin/Permission" line.
- **Meters:** smooth, high-contrast bars provide immediate feedback.
- **Local scoreboard:** top-10 per mode, saved as `{name, score, ts}` in `localStorage`; personal bests trigger subtle confetti (disabled if the user prefers reduced motion).
- **A11y & polish:** keyboard navigable, ARIA labels, ≥4.5:1 contrast, reduced-motion support, responsive layout.

Laugh mode (microphone + on-device audio ML)

- **Input & calibration:** The app uses Web Audio to capture 16 kHz audio; a 2-second quiet period estimates baseline RMS to avoid rewarding "shouts."
- **Classification: MediaPipe Tasks Audio** runs **YAMNet** locally (WASM), aggregating categories like *laugh, giggle, chuckle, snicker*. ([Google AI for Developers](#))
- **Scoring (JoyRank):**
  - Base = `100 × mean(laughter-probability)`
  - Penalty for exceeding baseline volume (fairness)
  - Streak bonus for sustained laughter
    Final **JoyRank** is rounded, non-negative, and tuned for fun.

Shake mode (phone motion sensors)

- **Input:** `DeviceMotionEvent` for acceleration and rotation (with iOS permission request path).
- **Integration:** The game integrates **acceleration-energy** and **rotation-energy** over 10 seconds.
- **Scoring (ShakeRank):** `round(6 × AccelEnergy + 2 × RotEnergy)`—rewarding both vigorous shakes and sharp twists.
- **Graceful desktop state:** If no sensors, the UI shows a gentle "no data" notice.

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6) Technology & Implementation

- **Framework-free:** Vanilla HTML/CSS/JS (ES modules), runs by opening `index.html` or via GitHub Pages.
- **Tailwind via CDN** for layout/utility classes; minimal custom CSS for brand feel.
- **Audio ML: MediaPipe Tasks Audio** (jsDelivr with unpkg fallback) and TFLite **YAMNet** model (TF Hub with GCS fallback); all inference is local. ([Google AI for Developers](#))
- **Web APIs:** `getUserMedia` (mic), Web Audio API (RMS/metering), `DeviceMotionEvent` (motion), `localStorage` (scores).
- **Privacy:** No servers, no accounts, no telemetry; processing and storage are **100% on-device**.

7) Visual & UX Direction

- **Tone:** Calm, hopeful, joyful.
- **Palette:** Indigo/Sky/Emerald with warm yellow for celebrations.
- **Micro-interactions:** Button ripples, meter pulses, confetti on PB; all honor `prefers-reduced-motion`.
- **Copy style:** Encouraging and stigma-free: "tiny boosts," "try a 10-second laugh," "shake it out—your way."

Localization notes for UI copy

- **Vietnam:** "Nhiều bạn trẻ gặp lo âu/chán nản nhưng ít người tiếp cận hỗ trợ. Hãy thử 10 giây cười hoặc vận động—một bước nhỏ để thấy dễ chịu hơn." (Grounded in V-NAMHS.) (qcmhr.org)
- **Australia:** "1 in 5 Australians experience a mental disorder each year. Short bursts of movement and shared laughter can help your mood today." (Australian Bureau of Statistics)

8) Impact Model & Evaluation

Theory of change (10 seconds at a time):

1. **Prompt** lowers activation energy.
2. **Immediate affective lift** from laughter/movement. ([PMC](PMC))
3. **Habit loop** via scores, PBs, and positive feedback.
4. **Awareness** through in-app stats for Vietnam & Australia. (qcmhr.org)

Device-local metrics you can track (privacy-safe):

- Session completion rate; replay rate; multi-day streaks
- Distribution of JoyRank/ShakeRank; PB frequency
- About page views (exposure to awareness copy)

9) Ethics & Guardrails

- **Not a medical device:** Copy clearly states that TogetherWe doesn't diagnose or treat; it **encourages** actions supported by evidence and signposts to professional help.
- **Fairness:** Laugh scoring penalizes loudness spikes to avoid rewarding shouting; Shake scoring weights both linear and rotational energy to respect different abilities.

*   **Transparency:** Visible secure-context and permission states; explicit privacy note ("All processing on your device; scores never leave your browser").

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10) Challenges & Limitations

*   **Browser variance:** iOS motion permissions and sampling differences require careful handling; the app includes permission flows and clear guidance.
*   **Model imperfections:** YAMNet may misclassify; smoothing and averaging mitigate outliers.
*   **Secure context:** Sensors require HTTPS or `localhost`; TogetherWe displays clear prompts to help users run it properly.

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11) Future Directions

*   **Modes:** mindful breathing via mic envelope; rhythm-tap via accelerometer; "sync-laugh" co-play over WebRTC (optional, opt-in).
*   **PWA packaging:** offline play and install banners.
*   **Opt-in sharing:** privacy-preserving, device-local QR handoff of top scores (no servers).

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12) Conclusion

TogetherWe shows that joyful, evidence-informed, **on-device** experiences can be both **impactful** and **ethical**. In contexts like Vietnam and Australia—where prevalence is high and access uneven—turning laughter and movement into a 10-second game offers a practical, stigma-free way to nudge mood and normalize help-seeking, one tiny win at a time. (qcmhr.org)

References

1. Viet Nam Adolescent Mental Health Survey (V-NAMHS) Report, 2023 (English). One in five adolescents (21.7%) had a 12-month mental health problem; 8.4% accessed services. (qcmhr.org)
2. UNICEF Viet Nam press note on adolescent mental health and access gaps, 2024. (UNICEF)
3. AIHW Prevalence and impact of mental illness (updated May 20, 2025). **22%** had a 12-month mental disorder; **17%** anxiety; **8%** affective. (AIHW)

4. ABS *National Study of Mental Health and Wellbeing 2020–2022*, latest release. **21.5%** with a 12-month mental disorder; **17.2%** anxiety; **8.0%** affective. ([Australian Bureau of Statistics](#))
5. Singh et al., 2023. **Umbrella review**: physical activity improves depression/anxiety/distress. *Br J Sports Med*. ([British Journal of Sports Medicine](#))
6. Singh et al., 2023. PubMed record for the umbrella review on physical activity and mental health. ([PubMed](#))
7. Noetel et al., 2024. **Systematic review & meta-analysis**: exercise vs controls for depression. *BMJ*. ([BMJ](#))
8. Zhao et al., 2019. **Meta-analysis**: laughter/humor interventions reduce depression and anxiety. *PubMed*. ([PubMed](#))
9. Basso & Suzuki, 2017. **Review**: **acute** bouts of exercise improve mood shortly after activity. *Neuropsychobiology/Reviews* (open-access summary). ([PMC](#))
10. Stamatakis et al., 2022. **VILPA**: short, vigorous bursts associated with lower mortality. *Nature Medicine*. ([Nature](#))
11. MediaPipe Audio Classifier (Web JS) — YAMNet in the browser (on-device). ([Google AI for Developers](#))

Appendix:

Why TogetherWe? In Viet Nam, **1 in 5 adolescents (21.7%)** face a mental health problem each year, yet only **8.4%** access support; in Australia, **1 in 5 adults (~22%)** experience a mental disorder annually. **Laughter** can reduce stress biology and **exercise** is a proven antidepressant— even **short bouts** help mood and health. TogetherWe turns these evidence-based actions into a playful 10-second challenge you can do anywhere, privately on your device—because tiny moments of **laughing and moving together** add up. ([qcmhr.org](#))