OpenMind — White Paper (v3): Mastery, Certificates, and the Value Cycle

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Abstract (One Page)

Education has an incentives problem. Systems are rewarded for minutes and coverage; learners are rewarded for tests they soon forget. OpenMind flips the incentives: **we only win when the learner reaches mastery** — and we mint a **verifiable, on-chain certificate** that encodes those results. Here's the point: when you master something real, you mint a verifiable, on-chain certificate that carries your results. It's portable, durable, and instantly verifiable by schools and employers.

This paper explains (1) our brain-aware learning model and parent-approved AI tutor, and (2) the **Certificate Value Cycle** — the engine that aligns creators, learners, and the platform around real learning. When learners succeed, value accrues to them first, creators second, and the platform last. **Mastery is the growth hack.**

Why now: Global outcomes fell (PISA 2022). Edtech impact is mixed (UNESCO 2023). The answer isn't more screens — it's **aligned incentives and brain-aware practice**.

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1) What's Broken (and Fixable)

Think of school like a gym that celebrates attendance instead of strength. Platforms that prize "time on device" are that gym. Meanwhile, public curricula are routinely politicised, so teachers tiptoe around topics and students practice compliance more than reasoning. Add tools that ignore how memory works and we get the results we see: high effort, low transfer.

Our way forward addresses three main issues:

- **Minutes over mastery.** Time-on-device is easy to count; competence isn't. We flip that.

- **Politics over pedagogy.** We remove ideological tug-of-war from core concepts so learners practice reasoning, not posture-taking.

- **Brain-blind design.** Forgetting wins without retrieval, spacing, worked examples, and interleaving. We bake them in.

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2) The Learning Model (Brain-Aware by Construction)

Retrieval practice strengthens memory like a muscle. **Spaced repetition** keeps forgetting from winning. **Worked examples** model thinking before we fade support. **Interleaving** makes transfer happen. We use these on purpose, with short cycles that don't exhaust attention.

Every unit ships **Learning Science Notes** so learners, teachers, and parents can see the *why* behind the design.

The **AI Personal Tutor** is not a free-form "friend app." It's a coach that:

- motivates and narrates progress;

- digests concepts into plain language;

- generates fresh examples that match the learner's context;

- designs real-world experiments and activities;

- shares related resources to extend learning.

Guardrails: teacher/parent in the loop, explainable steps, age gating and quiet hours, privacy by default, and **no 'AI-detector policing.'** Instead, we keep **process evidence** (drafts, attempts, retrieval traces) that proves the work is yours.

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3) The Certificate Value Cycle (the Engine)

Short version: when you **learn** → **verify** → **mint**, the whole system gets better — and the value accrues to the people doing the learning and creating.

Step-by-step (course-level flow):

1. **Learn:** The learner completes a course path built on retrieval + spacing + worked examples.

2. **Verify mastery:** The system checks spaced retrieval thresholds and task performance (with process evidence). No mastery, no minting.

3. **Mint:** The learner mints a **course certificate** on Polygon. Minting needs:

    - a **course token** (granted upon finishing the final node/assessment);

    - a small amount of **in-game currency** (to cover minting fees and art rights).

4. **Get in-game currency:** three options that preserve equity and control:

    - watch **ads** (kept separate from learning paths);

    - **buy** currency directly;

    - **subscribe** to a premium plan that includes infinite currency.

5. **Wallet creation:** a **personal wallet** is created at the first mint (custodial with export).

6. **Certificate design & rarity:** each course has a limited collection ("drop") with art that is **identical per rarity tier but course-specific and easily identifiable** (serialised; course metadata; learner proofs). Drops are **limited; once they sell out, they're gone**.

7. **Primary market:** initial mint goes to the learner. Portions of mint proceeds (after fees) flow to **creators** (teachers/authors/artists) and the **platform**. Portions of mint proceeds (after fees) flow to **creators** (teachers/authors/artists), and the **platform**.

8. **Secondary market (optional):** certificates are **soulbound by default** for fraud prevention and dignity; the learner can **enable transfer** later. If traded or gifted, creators may receive royalties. We do **not** market certificates as investments; there are **no guarantees** of value.

9. **Use & display:** certificates are **verifiable credentials** with **on-chain integrity** and **off-chain privacy**. Learners share them with schools/employers or

display at home.

10. **Growth loop:** proud learners **bring in more learners** (social sharing, referrals). Creator income funds more and better courses. The platform reinvests in pedagogy and safety. **Mastery fuels the flywheel.**

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4) Why Certificates Can Accrue Cultural Value (Without Speculation)

Imagine you could see the verifiable certificate from **a first physics class**, complete with learning traces and early notes. Even if the learner later becomes "Einstein-level," the certificate's value isn't hype; it's **provenance** — a signed artefact of real work at a real time. That's why we anchor proofs on-chain and keep details private off-chain: durable verification without leaking personal data.

We design for **use first** (study validation, employment) and **cultural value second** (display, collection, gifting across generations). Like all culture, some items become mementos that matter. **Use first, culture second** — cultural value is a by-product of provenance.

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5) On-Chain Design & Privacy (What We Publish, What We Don't)

- **Standards:** W3C Verifiable Credentials **(VC 2.0)** for the credential; ERC-721 for the certificate token.
- **On-chain:** metadata pointers + integrity hashes; issuer/creator IDs; timestamp; course + rarity; revocation/supersession flags.
- **Off-chain (with holder consent):** detailed score vectors, artefacts, and process evidence — shared via signed links; never dumped on-chain.
- **Revocation/Correction:** no silent edits. We issue a **superseding certificate** and flag the old one in a public issuer registry.
- **Minors:** Certificates can be held and displayed; transfers are restricted to guardians until age of majority.

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6) Roles & Incentives (Aligned, on Purpose)

- **Learners** earn recognition that travels and endures. Minting is unlocked by **mastery**, not minutes.
- **Creators (teachers, authors, artists)** are paid on primary mints and (optionally) via royalties; they also gain reputation via a public creator profile tied to audited courses.
- **Parents & Schools** get dashboards with explainable AI steps, weekly summaries, and one-click verification of results.
- **The Platform** only grows when the others do — measured by verified mastery, certificate verifications, and long-term retention.

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7) Product System (How It's Built)

- **Learner App:** mastery journeys, retrieval calendar, worked examples, **lab activities**, AI tutor with explainable steps.
- **Authoring Studio:** bias-checks, multi-review workflow, and embedded **Learning Science Notes** for each unit.
- **Org Console:** cohort analytics, standards mapping, verification reports.
- **Wallet & Credentials:** issue/export verifiable credentials; custody with export; rotation and recovery; consented verification links.

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8) Governance, Safety, and Parent Trust

- **Human-in-the-loop** for sensitive content; age-appropriate defaults; clear appeals.

- **Data minimisation** and **regional hosting** options; never sell personal data; no third-party ad tracking.
- **Transparent operations:** public changelog for content and safety; red-team prompts and publish outcomes.
- **Parent visibility:** Weekly summary that shows exactly what the AI did — prompts, sources, and practice — for their child.

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9) Impact & What We'll Measure

- **Mastery lift:** % hitting retrieval thresholds at 7/14/30/90 days.
- **Transfer:** performance on interleaved vs. blocked tasks.
- **Verification:** certificates verified by schools/employers (count and share of active learners).
- **Equity:** use in low-bandwidth contexts.
- **Trust:** parent/teacher satisfaction; incident rates.
- **Creator sustainability:** creator payouts; time-to-revision on substantiated flags.

Appendix A — Certificate Value Cycle

1) Learn → **2)** Verify → **3)** Mint (course token + in-game currency) → **4)** Wallet auto-created → **5)** Limited drop issued → **6)** Primary proceeds split (**creator/platform**) → **7)** Optional secondary with royalties → **8)** Share/verify/display → **9)** Referrals and enrolment lift → **10)** Reinvest.

Notes:

- Ads **never influence** learning pathways.

- Drops are **course-specific and rarity-based**; art is identical within a tier but clearly identifiable across courses.
- Limited collections mean scarcity is **policy**, not speculation.

Appendix B — On-Chain & VC Spec (Outline)

- **Token:** ERC-721 with creator royalties (EIP-2981); soulbound by default; learner can enable transfer.
- **VC Claims:** issuer DID, subject DID, achievement, score digest, timestamps, process-evidence digest.
- **Privacy:** off-chain artefacts in signed storage; consented access; on-chain hash for integrity.
- **Revocation:** superseding issue + public flag.

Appendix C — Glossary

- **Course token:** Non-transferable grant issued after passing the final assessment; required to mint a certificate; **limited** per learner per course.
- **In-game currency:** Utility credits used to cover mint/art costs; obtained via ads, direct purchase, or a premium plan that includes **infinite in-game currency**.
- **Soulbound (default):** Non-transferable until the owner explicitly enables transfer.
- **Process evidence:** Drafts, attempts, and retrieval traces that demonstrate authentic work.
- **VC 2.0:** W3C Verifiable Credentials, the open standard for portable, cryptographically signed credentials.

Closing

If school has felt like a place where **showing up** mattered more than **growing up**, this is your way forward. We align the economics of learning to the act of learning itself. When you master something real, you get a credential that lasts, creators get paid to make more of what works, and the rest of us get a smarter world. Mastery is the point. Everything else should orbit it.