OPEN DEMONSTRATION AND MASTERY-BASED EDUCATION ACT OF 2025 (ODMEA)

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TITLE I — SHORT TITLE; FINDINGS; PURPOSE

Section 101. Short Title

This Act may be cited as the **"Open Demonstration and Mastery-Based Education Act of 2025"** or **"ODMEA."**

Section 102. Findings

1. The U.S. education system relies on seat-time, rigid credentials, and closed assessments that no longer serve an AI-driven, rapidly changing labor market.
2. Learners, employers, and communities require trusted, portable, and open records of demonstrable competence.
3. Federally supported, standards-based, user-controlled infrastructure is necessary to unlock mastery-based advancement while preventing new forms of digital gatekeeping.

Section 103. Purpose

The purposes of this Act are to—
(a) establish a public, interoperable **U.S. Open Competence Registry (OCR)** for verifiable demonstrations of learning and skill;
(b) launch a **five-year federal pilot** of mastery-based learning pathways integrating transparent

AI copilots;
(c) enable voluntary, user-controlled **public portfolios** as alternatives to traditional credentials;
(d) ensure equity, privacy, and anti-abuse safeguards through annual audits and public reporting; and
(e) provide clear criteria for scaling successful pilots into a national backbone.

Section 104. Sense of Congress on Human-Factor Supports

It is the sense of Congress that effective mastery-based implementation requires (1) educator bias-calibration practices and (2) administrator change-management capacity. The Secretary is encouraged to prioritize these factors in pilot guidance and funding decisions and to incorporate emerging evidence into future Technical Implementation Profile updates.

TITLE II — DEFINITIONS

For the purposes of this Act:

1. **"Mastery-Based Advancement"** means learner progression triggered by verified demonstration of competence rather than seat-time or credit accumulation.
2. **"Open Competence Registry" ("Registry")** means the public, standards-driven digital infrastructure established under Title III.
3. **"AI Copilot"** means an artificial-intelligence system that assists instruction, assessment, or learner support, accompanied by public model documentation and auditable logs.
4. **"Public Portfolio"** means a user-controlled digital record of learning artefacts, endorsements, and Registry-verified achievements.
5. **"Gatekeeping Entity"** means any body controlling access to credentials, advancement, or learning resources, including accrediting agencies, licensing boards, or proprietary vendors.
6. **"Pilot Site"** means any school, district, higher-education institution, or learning network awarded a grant under Title IV.
7. **"Equity Audit"** means a systematic, disaggregated analysis of learner outcomes, access, and algorithmic performance across protected classes.

TITLE III — ESTABLISHMENT OF U.S. OPEN COMPETENCE REGISTRY

Section 301. Establishment

Within 18 months of enactment, the Secretary of Education ("Secretary") shall establish and maintain the **U.S. Open Competence Registry**.

(a) Design Principles. — The Registry shall—

1. maintain persistent metadata for every record, including timestamp, verification method, verifying entity, AI involvement, and privacy flag;
2. provide open, royalty-free application-programming interfaces aligned with W3C *Verifiable Credentials* and, pursuant to § 308, *Common Education Data Standards (CEDS)* and *Ed-Fi* logical models;
3. enable user-controlled export, deletion, and portability of records in machine-readable formats; and
4. publish and preserve a publicly accessible changelog for all schema or governance updates.

Section 302. Access and Participation

(a) **Voluntary Participation.** Individuals may opt-in at no cost; institutions may participate upon compliance with Registry standards.
(b) **Privacy-by-Design.** Role-based access, data minimization, and encryption at rest and in transit are mandatory.
(c) **Identity Assurance & Rate-Limiting.** Entities must meet NIST IAL2 prior to write access; adaptive rate-limiting and anomaly detection shall mitigate Sybil or bot-farm attacks.

Section 303. Governance

A 15-member multi-stakeholder Advisory Board—including educators, technologists, employers, privacy experts, and students—oversees standards via a transparent, version-controlled process.
(a) **Composition Cap.** No single interest group may hold more than 25 percent (25 %) of seats; vendor employees observe a two-year cooling-off period.
(b) **Employer Representation.** At least two seats shall be held by national employer organizations; the Board shall publish a biennial **Employer-Adoption Survey.**
(c) **Cyber & Fairness Sub-committee.** A standing sub-committee shall manage red-team exercises, bias audits, and security standards.

(d) **Special-Education Representation.** At least one seat shall be reserved for an individual with demonstrated expertise in special-education services or disability advocacy.

Section 304. Resilience, Offline Caching & Uptime Targets

The Registry shall maintain 99.9 percent (99.9 %) monthly uptime and provide edge-cache modules for Pilot Sites lacking reliable broadband, enabling credential validation offline for up to 72 hours.

Section 306. Digital Signatures & Dual Verification

All credential write operations must be cryptographically signed using an ECDSA scheme by both the verifying entity and the Registry. Signing keys must be stored in hardware security modules (HSMs) and subject to an annual custody and rotation audit. Independent monitoring shall run daily diff-checks to detect unauthorized or orphaned records.

Section 307. Interstate Data-Bridge Working Group

(a) **Establishment.** Within 12 months, the Secretary shall convene CCSSO and NGA to map state course codes, educator IDs, and assessment identifiers to Registry schema.
(b) **Maintenance.** Updates publish semi-annually via the Title VIII version-control process.
(c) **Seat-Time Waiver Toolkit & Safe Harbor.** By the start of Pilot Year 2, the Working Group shall publish model waiver language allowing districts to convert seat-time requirements into mastery credits. Pilot Sites adopting the model waiver and the accompanying reporting template shall receive safe-harbor protection in Department monitoring audits for discrepancies solely related to the waiver.

Section 308. Living Technical Implementation Profile

(a) **Standards Alignment.** Registry field definitions shall align with *Common Education Data Standards (CEDS)* and *Ed-Fi* logical models.
(b) **Profile Updates.** An annually versioned **Technical Implementation Profile (TIP)**, approved by the Advisory Board, shall define compliance; SIS/LMS vendors that implement the current TIP remain compliant without further legislation.

TITLE IV — FEDERAL PILOT PROGRAM: MASTERY-BASED LEARNING PATHWAYS

Section 401. Pilot Grants

Competitive grants (50–100 sites) shall implement mastery pathways with AI copilots. Additional criteria:

1. Allocate ≥ **10 percent (10 %)** of each grant to educator **Professional Development (PD)**.
2. Provide **bi-weekly human mentorship check-ins** per learner.
3. Submit an evaluation plan capable of meeting **ESSA Tier II** standards.
4. **Grant Scoring Weight.** The Secretary shall weight proposed educator bias-mitigation protocols and administrator change-management plans at no less than **10 percent of the total application score**.

Section 402. Funding Formula & Uses

(a) **Connectivity Reserve. 5 percent (5 %)** of annual appropriations is reserved for rural Title I Pilot Sites to upgrade broadband and devices.
(b) Remaining uses include infrastructure, AI licensing/development, and educator release time.

Section 403. Reporting & Sunset

Pilots publish anonymized, disaggregated outcome data annually; authority terminates five years after first grant unless extended in Title X.

Section 404. Professional Development & Technical Assistance

Grants may fund instructional-design coaches, copilot-specific PD modules, and substitute stipends.

Section 405. Mentorship & Social-Emotional Learning

Pilot Sites must document mentorship structures, SEL resources, and escalation protocols for at-risk learners, with metrics in quarterly reports.

Section 406. Independent Evaluation Standards

External evaluators meeting Institute of Education Sciences peer-review standards shall conduct outcome studies; datasets must be open within FERPA/IDEA limits.

Section 407. Teacher Capacity & Change-Management Reporting

Pilot Sites shall report, each semester, (a) total Professional Development hours per participating teacher, (b) percentage of PD hours dedicated to change-management or role-redefinition activities, and (c) teacher-retention rates within pilot classrooms. These metrics shall be included in annual public pilot reports and inform continuation of grant funding.

TITLE V — AI INTEGRATION AND PUBLIC COPILOT STANDARDS

Section 501. Transparency & Safety

AI copilots must:

1. Publish model cards (architecture, training-data domains, limitations, update history).
2. Maintain auditable logs for interactions affecting assessment or advancement.

3. Use **Secure DevOps & Authenticated Deploys**—signed binaries, reproducible builds, staged checksum validation, 24-hour public pre-deployment notice for MAJOR updates.
4. Implement **Exam-Mode Protections** (prompt-jailbreak detection, randomized question pools, watermarked content).
5. All copilots and Registry software must maintain a software bill of materials (SBOM) and vet dependencies per NIST/OMB guidance.

Section 502. Open Source Preference & Independent Audits

(a) Open-source or source-available copilots receive grant-scoring preference.
(b) The Secretary may commission third-party audits for bias, security, and pedagogical efficacy.
(c) **Dataset Provenance & Hold-Out Audits.** Vendors shall log training-data provenance and undergo periodic fairness audits with hold-out datasets.

Section 503. Compliance Clock

Material issues under §§ 501–502 must be remedied within 90 days or the copilot is suspended and related funds forfeited.

Contingency Migration. In the event of grantee termination or school closure, the Secretary shall ensure immediate migration of affected learner records to the Registry and reassign mentorship obligations to a backup Pilot Site within 30 days.

Section 504. Vendor & Grantee Liability; Learner Redress Fund

(a) Vendors and Pilot Sites are jointly liable for harms from negligent algorithms or data breaches.
(b) A **Learner Redress Fund** (≥ $10 million) capitalized from Title VII penalties shall provide swift remediation.

TITLE VI — PUBLIC PORTFOLIO INFRASTRUCTURE

Section 601. Portfolio Enablement

Registry users may link a Public Portfolio displaying selected achievements and artefacts.

Section 602. Interoperability & API Requirements

Portfolios shall support rich media and third-party endorsements and, via the TIP, integrate with at least two major LMS/e-portfolio platforms within 12 months of launch.

Section 603. Privacy Controls & Content Moderation

Users control visibility at artefact, badge, or portfolio level (default private). Services must meet WCAG 2.2 AA **and Section 508 of the Rehabilitation Act**, encrypt data, whitelist file types, scan for malware, and remove flagged content within 24 hours.

TITLE VII — ANTI-GATEKEEPING AND OPEN PARTICIPATION

Section 701. Open Participation Rights

No grantee may condition mastery-pathway access on proprietary credentials, closed platforms, or fees unrelated to service delivery.

Section 702. Prohibition on Unreasonable Exclusion

Unreasonable denial or distortion of bona-fide Registry or portfolio submissions is unlawful. Aggrieved parties may appeal to the Advisory Board; decisions are reviewable by the Secretary.

Section 703. Enforcement

The Secretary may impose civil penalties up to $50,000 per violation and withhold grant funds for repeated offences.

TITLE VIII — OPERATIONALISATION: REPORTING, FEEDBACK, VERSIONING

Section 801. Public Reporting

All pilot datasets, schema updates, and evaluations must publish in machine-readable form within 90 days of collection.

Section 802. User Feedback Mechanisms

The Secretary shall maintain an always-open public issue tracker and host an annual 30-day comment period on Registry and pilot standards.

Section 803. Version History & Migration Protocols

MAJOR updates (per Semantic Versioning) require a 60-day public review and must ship migration tooling to preserve data integrity.

Section 804. Immutable Logging

All Registry and pilot logs must be append-only and hash-chained. Quarterly checksums are published to a public ledger; unverifiable gaps constitute a material breach under § 503.

Section 805. Employer-Adoption Dashboard & Survey

The Advisory Board shall publish an annual dashboard summarizing Registry credential usage in hiring pipelines, drawing on survey data and federal hiring metrics.

TITLE IX — EQUITY, PRIVACY, AND ACCESSIBILITY

Section 901. Equity Audits & Remediation

Independent annual Equity Audits shall analyze disaggregated outcomes; statistically significant design-linked gaps trigger a remediation plan within 120 days.

Section 902. FERPA, IDEA, and Minor Consent Compliance

(a) All operations must comply with FERPA and IDEA.
(b) For K-12 learners, opt-in participation requires verified parental or guardian consent until age 18; opt-out must be equally simple.

TITLE X — SUNSET, SCALING, AND CONTINUING APPROPRIATIONS

Section 1001. Sunset & Evaluation

Within six years, the Secretary shall evaluate pilot efficacy, equity impact, and cost, recommending to scale, extend, or sunset the program.

Section 1002. Conditions for Scaling Nationally

Scaling requires: (1) ≥ 75 percent (75%) of Pilot Sites show significant mastery gains; (2) equity gaps narrow year-over-year; (3) privacy/cyber benchmarks met.

Section 1003. Appropriations

Authorizes $250 million per fiscal year 2026-2030.

Section 1004. Triggered Continuing Appropriations

If § 1002 conditions are met, $400 million per year for FY 2031-2035 is automatically authorized unless a joint resolution of disapproval passes within 180 days.

Section 1005. Research & Continuous Improvement Fund

Two percent of each fiscal-year appropriation authorized under this Title shall be set aside for competitive research grants administered by the Institute of Education Sciences to advance AI explainability, bias mitigation, and mastery-based pedagogy improvements relevant to this Act.

Section 1006. Post-2035 Sustainability Plan

By the end of Pilot Year 4, the Advisory Board shall submit to Congress a funding-model recommendation—covering Registry maintenance and audit costs post-FY 2035—evaluating options including user fees, public-private partnerships, and general appropriations.

APPENDIX A — RISK MODES, COUNTERMEASURES, IMPLEMENTATION ROADMAP

A.1 Core Risk Modes

#	Risk Mode	Practical Threat	Built-In Safeguard(s)
1	Vendor lock-in	Proprietary platform becomes indispensable	Open API mandate; source-available preference; 5-year recompete cycle
2	Privacy breach	Unauthorized access or data leakage	Encryption; privacy by design; independent security audits; 30-day breach notification rule
3	Algorithmic bias	Copilot systematically disadvantages protected groups	Model card transparency; annual equity audits; 90-day remediation clock
4	Pilot stagnation	Successful prototypes never scale	Five-year sunset; KPI-linked funding tranches
5	Regulatory capture	Incumbents manipulate standards for self-benefit	Board composition cap; public, version-controlled standard-setting

A.2 Red Team Vulnerabilities & Countermeasures

#	Attack Vector	Exploit Scenario	Safeguard / Implementation	Statutory Hook
1	Credential Forgery	Fake records via compromised API keys	Dual ECDSA signatures; daily diff checks by independent monitor	§ 306
2	Sybil/Bot Farm Accounts	Mass fake learners distort metrics	IAL2 identity proofing; adaptive rate limiting	§ 302
3	Model Tampering	Insider pushes poisoned or biased copilot update	Signed builds; staged checksum validation; 24-hour pre-deploy notice	§ 501
4	Training Data Poisoning	Adversary seeds biased data to skew outputs	Dataset provenance logs; hold-out fairness audits	§ 502(c)
5	Registry DoS	API flooded during exam windows	Autoscaling front end; geo-replicated read replicas; incident response plan	§ 304
6	Log Forgery	Admin alters logs pre-audit	Append-only hash-chained logs; quarterly checksum ledger	§ 804
7	Supply Chain Attack	Compromised third-party package (e.g., npm/PyPI malware)	SBOM audits; periodic dependency vetting; compliance with NIST/OMB guidance	§ 501
8	Key Custody Loss	Loss or theft of ECDSA signing keys	Hardware security modules (HSMs); annual key rotation/custody review	§ 306

A.3 Implementation Roadmap

#	Phase	Timeline	Key Deliverables	Lead Entity	Dependencies
0	Statutory Insertions	Day 0–30	§§ 304, 306, 502(c), 804 + Board cap & Secure DevOps clause in statute	DoE General Counsel	None
1	Interim Rulemaking	Month 1–4 (to 6 with FedReg notice)	NPRMs, public comment, final rules in Federal Register	DoE Office of Policy	Phase 0 complete
2	Standards & Reference Implementations	Month 3–9	TIP v0.1 (schema) by Mo 6; TIP v1.0 (API & test suite) by Mo 12; ECDSA lib, etc.	DoE Tech Dir., NIST, OSS	Phase 1 rules

#	Phase	Timeline	Key Deliverables	Lead Entity	Dependencies
3	Advisory Board Ramp-Up	Month 4–6	Seat members; composition cap; Cyber & Fairness subcommittees	Advisory Board Secretariat	Phase 1 rules
4	Compliance Clock Upgrade	Month 6	Revise § 503 benchmarks; compliance handbook	DoE Grants Mgmt	Phase 2 standards
5	Pilot Site Integration	Month 6–18	Key pair issuance, log endpoint activation, DoS gateway, edge cache hardware	Pilot Sites, DoE liaisons	Phase 4 handbook
6	First Annual Red Team Exercise	Month 12	≥ 80 percent pilot sites have immutable logs; contract external red team; Year 1 digest	Advisory Board Subcommittee	Phase 5 integrations
7	Remediation & Iteration Loop	Month 13–24 & annual	Patch findings, update toolkits, reallocate unused grant for urgent fixes	DoE + Pilot Sites	Red Team findings
8	Independent Audit Alignment	Month 18–30	Third-party audit of signing, logs, datasets; publish attestations	IG + auditors	Phase 5 deployments
9	Scale Readiness Assessment	Month 48–54 or after 3rd year	KPIs (0 critical breaches, <2 % forged attempts, bias Δ <1 SD); Board vote on scaling	DoE + Advisory Board	Red Team Y3 digest