

EDUCATION CANON

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Hadley Lab CANONIC

Abstract

Example

hadleylab.org Governed Research. Every claim cited.

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Student educational records **MUST** be protected under FERPA with access limited to legitimate educational interest.

Example: FERPA (Family Educational Rights and Privacy Act, 20 USC 1232g, 34 CFR Part 99) applies to all educational institutions receiving federal funding. Educational records: any record directly related to a student maintained by the institution or a party acting on its behalf. Directory information (name, address, phone, dates of attendance, degree, honors) may be disclosed without consent IF annual notification given AND opt-out period provided. Legitimate educational interest: school official performing a task specified in their job description, related to a students education. Annual notification requirements: rights to inspect, request amendment, consent to disclosure, file complaint with SPPO (Student Privacy Policy Office). COPPA (Childrens Online Privacy Protection Act, 15 USC 6501) applies to children under 13, requires verifiable parental consent for data collection by commercial operators; school-authorized exception allows ed-tech vendors to collect data on schools behalf. State-level extensions: California SOPIPA (Student Online Personal Information Protection Act) prohibits targeted advertising to students, building behavioral profiles, selling student data. New York Education Law 2-d supplemental data privacy protections and breach notification requirements for PII.

0.1 2. Curriculum Standards

Educational programs **MUST** align to recognized academic standards with measurable learning outcomes.

Example: Common Core State Standards (CCSS) adopted by 41 states + DC for K-12 ELA and Mathematics, defining grade-level expectations: e.g., CCSS.MATH.CONTENT.3.OA.A.1 (Interpret products of whole numbers). NGSS (Next Generation Science Standards) 3-dimensional learning: Disciplinary Core Ideas (DCI), Science and Engineering Practices (SEP),

Crosscutting Concepts (CCC), organized by Performance Expectations (PE). State standards: Texas TEKS (Texas Essential Knowledge and Skills), Virginia SOL (Standards of Learning) independently developed state-specific standards. Competency-Based Education (CBE): student advancement based on demonstrated mastery rather than seat time, supported by C-RAC (Council of Regional Accrediting Commissions) guidelines. Blooms Taxonomy (revised 2001): Remember, Understand, Apply, Analyze, Evaluate, Create hierarchical classification of learning objectives used in curriculum design. OBE (Outcomes-Based Education): defining exit-level outcomes, program outcomes, and course-level outcomes with assessment rubrics. Alignment tools: Webbs Depth of Knowledge (DOK) levels 1-4 for cognitive complexity, Achieve alignment protocol for standards-assessment alignment.

0.2 3. Assessment Integrity

Educational assessments MUST produce verifiable evidence of learning using standardized data models and secure delivery.

Example: SCORM (Sharable Content Object Reference Model) ADL (Advanced Distributed Learning) specification defining: content packaging (IMS Content Packaging), run-time environment (API communication with LMS), and sequencing/navigation. SCORM 2004 4th Edition supports complex sequencing rules, objectives tracking, and multi-SCO content. xAPI (Experience API, formerly Tin Can API) statement-based learning record format: Actor + Verb + Object (e.g., John completed Module 3), stored in LRS (Learning Record Store), enabling tracking beyond LMS boundaries (simulations, mobile, VR, on-the-job). QTI (IMS Question and Test Interoperability) XML-based standard for representing assessment items and tests, v3.0 supports: simple choice, multiple choice, text entry, essay, drawing, composite items. Assessment security: proctoring standards per ATP (Association of Test Publishers) guidelines, includ-

ing remote proctoring (AI-based, live, recorded review), biometric authentication, browser lockdown (Respondus LockDown Browser), and item exposure control. Psychometric standards: AERA/APA/NCME Standards for Educational and Psychological Testing (2014) validity evidence (content, response process, internal structure, relations, consequences), reliability coefficients (Cronbachs alpha > 0.80 for high-stakes), and fairness (DIF analysis, accommodations).

0.3 4. Accreditation

Educational institutions and programs MUST maintain accreditation from recognized accrediting bodies with evidence of continuous improvement.

Example: Regional/institutional accreditors recognized by USDE (US Department of Education) and CHEA (Council for Higher Education Accreditation): SACSCOC (Southern Association of Colleges and Schools Commission on Colleges) 73 standards across 14 sections, 10-year reaffirmation cycle with 5th-year interim report. HLC (Higher Learning Commission) Open Pathway and Standard Pathway, criteria for accreditation in 5 areas: mission, integrity, teaching/learning quality/resources/support, teaching/learning evaluation/improvement, institutional effectiveness/planning. WASC Senior (WSCUC) standards organized around: institutional purposes, academic programs, fiscal/physical/information resources, and organizational structures. NWCCU (Northwest Commission on Colleges and Universities) 7-year cycle, Year 1 self-evaluation, Year 3 mid-cycle, Year 7 evaluation of institutional effectiveness. Programmatic accreditors: ABET (engineering/computing/applied science/natural science) program-level accreditation with Student Outcomes (1-7) and Continuous Improvement process, typically 6-year cycle. AACSB (business) 9 accreditation standards, AOL (Assurance of Learning) requirements,

5-year continuous improvement review. CCNE (nursing), LCME (medicine), ABA (law). Outcomes assessment: Institutional effectiveness = mission fulfillment + student achievement benchmarks (retention, completion, licensure pass rates, employment).

0.4 5. Credential Verification

Academic credentials MUST be verifiable, tamper-evident, and interoperable across institutions and employers.

Example: PESC (Postsecondary Electronic Standards Council) XML-based standards for educational data exchange: College Transcript (official academic record exchange between 3,600+ institutions), Admissions Application, Financial Aid. EDI (Electronic Data Interchange): SPEEDE/ExPRESS historical transcript exchange network. Digital badges: IMS Open Badges v3.0 (aligned with W3C Verifiable Credentials) JSON-LD format containing: issuer, recipient, criteria, evidence, and alignment to standards. Badge validation: hosted verification (issuer URL), signed verification (cryptographic signature), and blockchain-anchored verification. W3C Verifiable Credentials (VC) decentralized credential model: Issuer, Holder, Verifier triangle, using DIDs (Decentralized Identifiers), JSON-LD proof, and selective disclosure. CLR (Comprehensive Learner Record) IMS Global standard extending transcripts to include competencies, co-curricular achievements, and experiential learning. European standards: ECTS (European Credit Transfer System) 60 credits/academic year, Bologna Process harmonization across 49 countries. Europass Digital Credentials EU-wide framework for digitally-signed qualifications. Diploma supplement: standardized description of qualification (8 sections per Bologna framework). National Student Clearinghouse enrollment and degree verification for 97% of US higher education students.

0.5 6. Instructional Technology

Learning management systems and educational technology MUST implement interoperability standards for content, tools, and data exchange.

Example: LMS platforms: Canvas (Instructure, 30M+ users), Blackboard (Anthology, deployed at 2,700+ institutions), Moodle (open source, 300M+ users, 100K+ sites). LTI (Learning Tools Interoperability) IMS Global standard enabling seamless tool integration: LTI 1.3 (OIDC-based authentication, JWT security tokens, deep linking, Names and Role Provisioning, Assignment and Grade Services). LTI Advantage = LTI 1.3 + Deep Linking + Assignment and Grade Services + Names and Role Provisioning Services. IMS Global (now 1EdTech): CASE (Competency and Academic Standards Exchange) machine-readable standards frameworks. OneRoster standard for exchanging class roster data between SIS and LMS (CSV and REST API). Caliper Analytics IMS standard for measuring learning activities, generating Learning Sensor data (events: NavigationEvent, AssessmentEvent, GradeEvent) sent to Caliper endpoint. Ed-Fi Data Standard K-12 data model covering students, staff, education organizations, assessments, used by SEAs (State Education Agencies) and LEAs (Local Education Agencies). SIF (Schools Interoperability Framework) data sharing for K-12 administrative systems. Accessibility: WCAG 2.1 AA compliance (US Section 508, ADA Title II/III), VPAT (Voluntary Product Accessibility Template), UDL (Universal Design for Learning) framework.

1. Constraints

MUST: Cite FERPA, accreditation body, or education
 MUST: Distinguish between learning analytics (evid
 MUST NOT: Present LMS activity logs as equivalent to g

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