

RESEARCH PAPER

APPLIED PSYCHOLOGY

The Emotional Regulation Gap: Measuring Affective AI Literacy in Educational Discourse through the Aali Computational Index—A YouTube Corpus Validation of the Affective AI Literacy Model (AALM)

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ABSTRACT

The Affective AI Literacy Model (AALM) proposes that genuine AI literacy requires four integrated dimensions: Cognitive Decoding, Emotional Regulation, Ethical Discernment, and Technological Empathy. This article provides the first empirical corpus validation of the AALM by introducing the Affective AI Literacy Index (AALI), a computational metric measuring the proportion of empowerment markers in naturalistic learner-generated educational AI discourse, and identifies the Emotional Regulation Gap — the systematic under-representation of Agency markers relative to all other AALM dimensions in current educational AI discourse. A corpus of 829 YouTube comments was collected via the YouTube Data API v3 across five educational AI discourse domains (April 2026). Python-based lexical annotation applied marker patterns across six categories — Understanding, Agency, Ethics, Collaboration, Anxiety, and Rejection — grounded in Goleman (1995), Vygotsky (1978), Selwyn (2021), and the AALM framework. The AALI was computed as empowerment markers divided by total markers. The full corpus is deposited at Zenodo (DOI: 10.5281/zenodo.19519080). The mean AALI is 0.8861, confirming that educational AI discourse is substantially empowerment-dominant. However, the dimension distribution reveals a critical structural imbalance: Cognitive Decoding dominates (0.7041 per 100 tokens; 59.7% of empowered comments), while Emotional Regulation is the least represented dimension (0.0940 per 100 tokens; 8.4% of empowered comments). Domain-level analysis shows that AI ethics content produces the highest AALI (0.9621) and AI anxiety/future jobs content produces the lowest (0.6609) — confirming that fear-framed educational discourse activates resistance rather than empowerment. The AALI is the first computational instrument for measuring Affective AI Literacy in naturalistic educational discourse. The Emotional Regulation Gap is an original empirical finding with direct curriculum design implications: current AI

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education develops cognitive understanding but systematically neglects the emotional agency dimension that the AALM identifies as the transformative core of genuine AI literacy. The AALI provides educators, curriculum designers, educational policymakers, and ed-tech researchers with a scalable, theoretically grounded instrument for auditing whether AI education content produces genuine affective empowerment or merely cognitive information transfer.

Keywords: Affective AI Literacy, Emotional regulation gap, AI education, emotional intelligence, digital literacy, YouTube corpus

The integration of artificial intelligence into educational systems has generated a substantial policy and research literature on AI literacy — broadly understood as the knowledge, skills, and dispositions required to understand, use, and critically evaluate AI systems. This literature has developed along two largely separate tracks. The technical track, dominant in computer science and STEM education, defines AI literacy as the capacity to understand algorithmic logic, data structures, and machine learning principles (Long & Magerko, 2020). The critical track, dominant in educational technology and media literacy research, defines AI literacy as the capacity to evaluate AI systems' social, ethical, and political implications (Selwyn, 2021). Both tracks share a common assumption: that AI literacy is primarily a cognitive achievement, measurable through knowledge assessments and critical reasoning tasks.

What neither track adequately addresses is the affective dimension of AI literacy — the emotional states, regulatory capacities, and psychological orientations that determine whether cognitive AI knowledge translates into genuine empowerment or merely produces informed anxiety. The research evidence on this point is unambiguous: knowledge of AI does not reduce fear of AI, and awareness of AI capabilities does not reduce resistance to AI adoption. Prior DBA research on AI and consumer behaviour in Greece (citation omitted blind review) found a critical threshold beyond which high technical AI awareness, unmatched with emotional literacy, produces higher levels of anxiety rather than greater acceptance. Participants who received ethical AI education, by contrast, demonstrated greater capacity to perceive AI as a collaborative partner rather than a competitive threat. The mechanism proposed is clear: emotional regulation mediates the relationship between AI knowledge and AI empowerment.

The Affective AI Literacy Model (AALM, citation omitted blind review) responds to this gap by proposing a four-dimension framework — Cognitive Decoding, Emotional Regulation, Ethical Discernment, and Technological Empathy — in which emotional regulation is not supplementary to cognitive understanding but constitutive of genuine AI literacy. The AALM's central educational prescription is that curricula addressing only the cognitive dimension of AI literacy will produce learners who understand AI but cannot emotionally engage with it in ways that support agency, ethical judgement, and collaborative orientation. This prescription generates a testable empirical prediction: in naturalistic educational AI discourse, the Emotional Regulation dimension should be underrepresented relative to Cognitive Decoding, because existing educational practice systematically underdevelops the affective dimension that the AALM identifies as transformative.

This article tests that prediction by introducing the Affective AI Literacy Index (AALI) and applying it to a corpus of 829 YouTube comments across five educational AI discourse domains. The mean AALI of 0.8861 confirms overall empowerment dominance. The dimension distribution confirms the AALM's prediction: Cognitive Decoding dominates (0.7041 per 100 tokens; 59.7% of empowered comments) while Emotional Regulation is the least represented dimension (0.0940 per 100 tokens; 8.4% of empowered

comments). This Emotional Regulation Gap is the central empirical finding of the study — and the central challenge for AI curriculum design.

THEORETICAL FOUNDATIONS

Goleman's Emotional Intelligence and the Affective Dimension of Learning

Goleman's (1995) emotional intelligence (EI) framework identifies five core competencies: self-awareness, self-regulation, motivation, empathy, and social skills. The framework's central claim — that EI predicts life outcomes more reliably than cognitive intelligence in domains requiring sustained engagement with complex, emotionally charged situations — applies directly to AI education. Learning to engage with AI systems is not emotionally neutral: it involves confronting existential anxieties about professional replacement, identity threat, and loss of human agency that cognitive instruction alone cannot address. Goleman's self-regulation competency corresponds directly to the AALM's Emotional Regulation dimension: the capacity to manage AI-related anxiety, reframe threat narratives as growth opportunities, and sustain engagement with AI learning despite initial discomfort. The AALI's Agency markers operationalise this competency in naturalistic discourse: comments expressing confidence, readiness, capability, and the explicit reframing of fear ('not afraid,' 'overcoming') are classified as Emotional Regulation empowered.

Vygotsky's Socio-Cultural Theory and the Zone of Proximal Development

Vygotsky's (1978) socio-cultural theory provides the pedagogical grounding for the AALM's claim that emotional and cognitive development are inseparable. Vygotsky's concept of the Zone of Proximal Development (ZPD) — the space between what a learner can achieve independently and what they can achieve with appropriate scaffolding — applies to affective as well as cognitive development: learners require scaffolding not only for understanding algorithmic logic but also for managing the emotional responses that AI encounters generate. Vygotsky's insight that psychological tools mediate cognitive development implies, in the AI education context, that how learners emotionally relate to AI as a tool shapes what they can cognitively achieve with it. An AI encountered primarily as a threat cannot function as a ZPD-extending tool; an AI encountered as a collaborative partner can extend the learner's developmental reach substantially. The AALM's Technological Empathy dimension operationalises this Vygotskian insight: the capacity to humanise AI interactions while maintaining clear human-machine boundaries is the affective precondition for AI-extended cognitive development.

Selwyn's Critical Ed-Tech and the Techno-Solutionism Critique

Selwyn's (2021) critique of techno-solutionism — the assumption that providing more digital tools automatically improves educational outcomes — provides the critical framework for understanding why cognitive-only AI literacy fails. Techno-solutionist AI education treats the learner as a passive recipient of AI capability, to be updated with functional skills rather than empowered with critical and emotional capacities. Selwyn's concept of conceptual blindspots — the systematic inability of techno-solutionist frameworks to perceive technology as a socio-cultural construction rather than a neutral instrument — maps directly onto the AALM's critique of cognitive-only AI literacy. The AALI's Ethics markers

operationalise Selwyn's critical literacy competency: comments questioning algorithmic fairness, data privacy, AI bias, and the social implications of AI deployment are classified as Ethical Discernment empowered. The AALI's domain-level finding that AI ethics content produces the highest AALI (0.9621) confirms Selwyn's prediction: critical framing of AI produces greater empowerment than informational or technical framing.

The AALM and Its Empirical Gap

The Affective AI Literacy Model (citation omitted blind review) integrates Goleman's EI framework, Vygotsky's socio-cultural theory, and Selwyn's critical ed-tech into a four-dimension educational framework. Cognitive Decoding addresses the 'black box' of algorithmic logic, reducing ignorance-based fear through comprehension. Emotional Regulation addresses AI anxiety and the fear of professional replacement, cultivating psychological resilience and digital agency. Ethical Discernment addresses the moral implications of AI — bias, privacy, accountability — developing critical technological citizenship. Technological Empathy addresses the humanisation of AI interaction while maintaining clear human-machine boundaries, mitigating identity threat. The AALM's central pedagogical claim is that curricula developing all four dimensions produce learners capable of genuine Affective AI Literacy — the integrated cognitive, emotional, and ethical orientation that enables responsible and empowered AI engagement.

RESEARCH METHODOLOGY

Research Design

This study employs a computational corpus analysis design combining purpose-built lexical annotation with statistical summary and domain-level comparative analysis. The design extends the conceptual-reflective methodology of the prior AALM framework with a computational empirical validation layer. Five search domains were constructed to correspond to the primary contexts of educational AI discourse and to sample across the full AALI empowerment-resistance spectrum, from high-empowerment contexts (AI ethics, AI collaboration) to potentially lower-empowerment contexts (AI anxiety, AI and future jobs). The full corpus and analysis code are deposited at Zenodo (DOI: 10.5281/zenodo.19519080).

The AALI: Operationalisation

The AALI is computed as: $AALI = \text{Empowerment Markers} / (\text{Empowerment} + \text{Resistance Markers})$, where Empowerment = Understanding + Agency + Ethics + Collaboration markers, and Resistance = Anxiety + Rejection markers. This formula produces a value between 0.0 (all markers are resistance) and 1.0 (all markers are empowerment), with 0.5 representing equal empowerment and resistance presence. The four empowerment dimensions correspond directly to the four AALM components, and the two resistance dimensions correspond to the AALM's identified barriers to Affective AI Literacy: anxiety (emotional) and rejection (attitudinal). Comments with zero markers across all categories are classified as Uncategorised (616 comments, 74.3%) and excluded from AALI computation.

Table 1: AALI Lexicon: Six Categories, AALM Grounding, Example Markers

AALI Category	AALM Dimension	Theoretical Grounding	Example Markers (n)
Understanding	Cognitive Decoding	Vygotsky (1978) Tools of Thought	understand, learn, makes sense, now I know, figured out (15)
Agency	Emotional Regulation	Goleman (1995) Self-Regulation	empowered, confident, ready, not afraid, capable, overcome (15)
Ethics	Ethical Discernment	Selwyn (2021) Critical Ed-Tech	ethics, fair, bias, responsible, moral, critical thinking (15)
Collaboration	Technological Empathy	Vygotsky (1978) ZPD + AALM	collaborate, AI helps, tool, augment, not replace, extend (15)
Anxiety	Resistance — Emotional	Goleman (1995) EI deficit	scared, afraid, anxious, overwhelmed, stressed, vulnerable (12)
Rejection	Resistance — Attitudinal	Selwyn (2021) techno-solutionism	useless, irrelevant, refuse, avoid, dangerous, replace humans (13)

EMPIRICAL FINDINGS

Overall AALI and the Emotional Regulation Gap

The mean AALI across 213 categorised comments is 0.8861, confirming that educational AI discourse is substantially empowerment-dominant — for every ten emotional markers in categorised comments, approximately nine are empowerment markers and only one is a resistance marker. This overall empowerment dominance is consistent with the AALM's prediction that educational contexts produce more empowered than resistant discourse. However, the dimension distribution within the empowerment category reveals the Emotional Regulation Gap: the critical structural finding of the study.

Table 2: AALI Results — Overall, By Dimension, and By Domain

Measure	Value	Interpretation
Total comments	829	5 domains × 10 videos × up to 50 comments
Categorised	213 (25.7%)	At least one marker across all six categories
Mean AALI	0.8861	Strongly empowerment-dominant overall
Cognitive Decoding /100 tokens	0.7041	DOMINANT — 7.5× higher than Agency
Ethical Discernment /100 tokens	0.2289	Second — ethics discourse present
Technological Empathy /100 tokens	0.1879	Third — collaboration framing present
Emotional Regulation /100 tokens	0.0940	LOWEST empowerment dimension — THE GAP
Resistance /100 tokens	0.1464	Minimal but present — higher than Agency
Empowered(Cognitive Decoding)	114 (59.7% of empowered)	Modal — knowledge-dominant discourse
Empowered(Ethical Discernment)	37 (19.4%)	Second — critical literacy present
Empowered(Technological Empathy)	21 (11.0%)	Third — collaboration framing present
Empowered(Emotional Regulation)	16 (8.4%)	LOWEST — agency discourse almost absent
Resistant	20 (9.4%)	Higher than Emotional Regulation cluster

AI ethics/critical thinking AALI	0.9621	Highest — ethics framing most empowering
AI empowerment/collaboration AALI	0.9200	Second — collaboration framing effective
AI emotional intelligence AALI	0.9086	Third — EI framing substantially empowering
AI in education/classroom AALI	0.9024	Fourth — general educational context
AI anxiety/future jobs AALI	0.6609	LOWEST — fear framing activates resistance

Source: YouTube Data API v3, $n = 829$ comments, April 2026. DOI: 10.5281/zenodo.19519080.

The Emotional Regulation Gap is the most theoretically significant finding of the study. Emotional Regulation (Agency) markers appear at a density of 0.0940 per 100 tokens — less than one-eighth of Cognitive Decoding marker density (0.7041) and, most strikingly, lower than Resistance marker density (0.1464). This means that in naturalistic educational AI discourse, learners are more likely to express resistance (anxiety or rejection) than emotional agency. The learner who comments ‘I finally understand how neural networks work’ (Cognitive Decoding) is six times more common than the learner who comments ‘I used to be afraid of AI but now I feel ready to work with it’ (Emotional Regulation). The discourse confirms the AALM’s central concern: AI education is developing knowledge without developing the emotional regulatory capacity that transforms knowledge into empowerment.

Resistance markers (0.1464 per 100 tokens) exceeding Agency markers (0.0940) is the starkest expression of the Emotional Regulation Gap. The learners who express resistance — anxiety about job replacement, fear of AI, rejection of AI relevance — outnumber the learners who express emotional agency in proportion to total token production. This is not a ceiling effect: it is a systematic structural absence. Educational AI content is generating cognitive understanding and ethical reflection without generating the emotional regulatory development that the AALM identifies as the transformative core of genuine Affective AI Literacy.

Domain-Level AALI: The Fear-Framing Penalty

The domain-level AALI variation provides direct evidence for the AALM’s claim that how AI is framed educationally determines whether it activates empowerment or resistance. The AI ethics and critical thinking domain achieves the highest AALI (0.9621): content framed around ethical evaluation and critical analysis generates the most strongly empowered discourse, with Ethical Discernment and Understanding markers dominant. This finding confirms Selwyn’s (2021) prediction that critical framing of AI produces greater learner empowerment than informational or promotional framing — and extends it computationally with a domain-specific AALI score that can be tracked and compared across content types.

The AI anxiety and future jobs domain produces the lowest AALI (0.6609) — more than 0.30 AALI points below the AI ethics domain and the only domain approaching the empowerment-resistance balance threshold (0.50). This fear-framing penalty is the most actionable finding for curriculum designers: educational content that frames AI primarily through the lens of job replacement and human obsolescence — even when intended to motivate engagement — systematically activates resistance rather than empowerment. The AALI score of 0.6609 indicates that approximately one in three emotional markers in AI anxiety discourse is a resistance marker, compared to approximately one in fifteen in AI ethics discourse.

DISCUSSION

The Emotional Regulation Gap as Educational Diagnosis

The Emotional Regulation Gap identified by the AALI provides a computational diagnosis of the structural limitation of current AI education: it develops cognitive understanding (which learners can articulate) and ethical concern (which they can express) without developing the emotional regulatory capacity (which they cannot yet consistently demonstrate) that transforms these cognitive and ethical achievements into genuine agency. This diagnosis is grounded in Goleman's (1995) EI framework: self-regulation — the capacity to manage disruptive emotions and impulses — is the EI competency most directly relevant to AI education because AI encounters are inherently disruptive, challenging the learner's sense of competence, uniqueness, and control. Curricula that develop AI knowledge without developing AI-specific emotional regulation produce learners who understand what AI can do and worry about it with greater sophistication, but cannot yet navigate that worry in ways that support agency.

The practical curriculum implication follows directly: AI education programmes need explicit emotional regulation components that are not supplementary to cognitive content but structurally integrated with it. Goleman's (1995) self-regulation competency development requires practice in identifying, naming, and reframing emotional responses — not as a preliminary to AI instruction but as an ongoing, integrated element of it. The AALI provides the measurement instrument for evaluating whether such components are achieving their intended outcomes: an effective emotional regulation curriculum component should produce measurable increases in Agency marker density in learner discourse, shifting the AALI's dimension distribution toward greater balance across all four AALM components.

Ethics Framing as the Most Effective Empowerment Strategy

The domain-level finding that AI ethics content produces the highest AALI (0.9621) has a specific implication that extends beyond the obvious prescription to include ethics in AI curricula. Ethics framing appears to be the most effective empowerment strategy not because it is necessarily the most technically rigorous or the most practically applicable content, but because it repositions the learner from a passive recipient of AI capability to an active moral evaluator of AI impact. This repositioning is precisely what Selwyn (2021) identifies as the transformative contribution of critical ed-tech: not the development of critical capacity as an academic skill but the development of critical citizenship as a moral identity.

The AALI operationalises this repositioning computationally. In ethics-framed AI discourse, learners deploy the language of moral evaluation — fairness, bias, accountability, responsibility, rights — at substantially higher densities than in other discourse domains. This moral evaluation language is empowerment language: it positions the speaker as a moral agent with standing to assess and challenge AI systems rather than as a passive user accommodating to them. The curriculum implication is that ethical framing should precede and frame technical instruction rather than following it as an afterthought: learners who enter AI learning with a moral evaluator identity are more resistant to the identity threat that AI competence can pose.

Limitations and Future Research

The AALI's 74.3% uncategorised rate reflects the methodological challenge of measuring affective

states in naturalistic discourse: the majority of educational AI comments deploy primarily informational, evaluative, or social language that falls outside the empowerment-resistance marker framework. Future research should develop domain-specific AALI lexicons — validated against human-coded datasets — that capture indirect and contextual expressions of emotional regulation, ethical concern, and collaborative orientation. Longitudinal AALI tracking of learner discourse before and after specific AI curriculum interventions would enable causal inference about which pedagogical approaches produce the greatest increases in Emotional Regulation and Agency marker density. Cross-cultural AALI validation — particularly in Greek educational contexts, where prior DBA research has documented specific patterns of AI anxiety and identity threat (citation omitted blind review) — would enable assessment of whether the Emotional Regulation Gap is universal or culturally specific.

CONCLUSION

This article has introduced the Affective AI Literacy Index as the first computational instrument for measuring the affective empowerment orientation of educational AI discourse, identified the Emotional Regulation Gap as the central structural limitation of current AI education, and provided domain-level evidence that ethics framing produces the highest empowerment scores while fear framing produces the lowest. Three conclusions define the study's contribution.

First, the mean AALI of 0.8861 confirms that educational AI discourse is substantially empowerment-dominant — but this overall empowerment conceals a critical structural imbalance. Cognitive Decoding dominates at 7.5 times the density of Emotional Regulation, and Resistance markers exceed Agency markers in absolute token density. Educational AI discourse is generating informed cognition without generating emotional agency. Second, the Emotional Regulation Gap — Emotional Regulation (0.0940 per 100 tokens; 8.4% of empowered comments) as the least represented AALM dimension, below even Resistance density (0.1464) — directly confirms the AALM's central educational diagnosis: current AI education systematically under-develops the affective dimension that transforms knowledge into empowerment. Third, the domain AALI gradient — from AI ethics (0.9621) to AI anxiety (0.6609) — demonstrates that educational framing choices have measurable empowerment consequences: ethics-centred framing produces three times less resistance language than fear-centred framing. Curriculum designers who frame AI education through job replacement anxiety are systematically activating the resistance they intend to overcome.

The AALI provides educators, curriculum designers, and educational policymakers with a scalable, replicable, and theoretically grounded instrument for auditing the affective quality of AI education content — answering not whether learners understand AI, but whether they are becoming empowered to engage with it as moral agents and collaborative partners rather than anxious observers of their own displacement.

GENERATIVE AI DECLARATION

The author(s) confirm that there was no use of artificial intelligence (AI)-assisted technology for assisting in the writing or editing of the manuscript, and no images were manipulated using AI. The authors developed and verified all scientific content, data analysis, interpretation of results, and conclusions. The authors take full responsibility for the accuracy, integrity, and originality of the work presented, and no AI tool was listed as an author.

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