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Reconceptualizing Bloom's Taxonomy for an Integrated Architecture of Learning

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ABSTRACT

For nearly seventy years, Bloom's cognitive, affective, and psychomotor domains have supplied education's default definition of a whole learning outcome. This article argues that the three-domain architecture is no longer theoretically adequate to that task and proposes a seven-dimension architecture — affective, cognitive, executive, embodied, aesthetic-expressive, sociocultural, and ethical — as a theoretical alternative. The three-domain model is shown to be structurally insufficient on four grounds: it omits capacities essential to whole-person learning; it treats its named domains as non-interacting silos with no account of how they combine within a single learner; it misrepresents embodiment as a parallel skill track rather than as constitutive of cognition; and it predates the executive-function, social-cognitive, and developmental-neuroscience literatures that now document these capacities as distinct, sequentially maturing systems. The seven-dimension architecture addresses each insufficiency, sequencing the dimensions along parallel gradients of neurobiological and functional complexity such that each is a precondition for the next. Two consolidation tables position the argument and the alternative architecture for rapid appraisal. The article closes by examining the necessity and holistic usefulness of this transition for competency-based and policy-aligned education, while positioning the seven-dimension model as a theoretical proposal requiring empirical validation rather than a settled replacement for Bloom's taxonomy.

***Keywords**: Bloom's Taxonomy, Three-Domain Model, Seven Dimensions, Holistic Learning, Embodied Cognition. Competency-based Education, Educational Theory.*

Introduction

Benjamin Bloom and his collaborators set out, in the 1950s and 1960s, to give the fledgling field of educational evaluation a shared vocabulary for what a learning outcome is (Bloom et al., 1956; Krathwohl et al., 1964; Simpson, 1972; Harrow, 1972). The resulting three domains — cognitive, affective, and psychomotor — have proved remarkably durable. Curriculum documents, lesson-planning templates, and assessment rubrics across the world still organize learning objectives under this tripartite scheme, and the cognitive taxonomy in particular remains the most widely taught framework in teacher education programs globally.

Durability, however, is not the same as adequacy. The three-domain architecture was built to classify the objectives of a knowledge-transmission and skill-acquisition curriculum. Education has since moved through an outcomes orientation, a constructivist turn, and a competency movement (Rychen & Salganik, 2003; Weinert, 2001) toward what Guba and Lincoln's (1989) generational framework would place as a fifth generation of curricular and evaluative thought, beyond their own fourth: holistic, competency-based learning, in which a learner's development is judged not by isolated domain scores

but by an integrated profile of capacities deployed together in authentic tasks. This is not a marginal position. It is the explicit aim of India's National Education Policy 2020 (Ministry of Education, Government of India, 2020) and is operationalized by the National Curriculum Framework for School Education 2023 through the Pañcakoś Vikas model, a five-sheath account of human development drawn from the Taittirīya Upaniṣad (Trans. Gambhirananda, 1986; National Council of Educational Research and Training, 2023).

The three-domain architecture was not built for this task, and this article argues that it cannot be adequately retrofitted to it. The purpose here is not to dismiss Bloom's contribution — the cognitive taxonomy in particular remains a genuine achievement in operationalizing levels of understanding — but to show, on independent theoretical grounds, why a transition from three domains to seven dimensions is necessary for holistic, competency-based education, and to specify what such a transition would look like. The article proceeds in five steps. Section 2 describes the three-domain architecture and the conditions of its original design. Section 3 sets out four structural insufficiencies of that architecture, consolidated for rapid appraisal in Table 1. Section 4 introduces the seven-dimension architecture as a theoretical alternative and its sequencing logic. Section 5 grounds each of the seven dimensions theoretically, consolidated in Table 2. Section 6 discusses the necessity and holistic usefulness of the transition, and Section 7 positions the proposal's epistemic status and limitations before concluding with an assessment of what remains to be established through empirical work.

The Three-Domain Architecture: Origins and Enduring Influence

Bloom's cognitive taxonomy (Bloom et al., 1956) ordered educational objectives into six increasingly complex categories of intellectual behavior, from knowledge recall through comprehension, application, and analysis to synthesis and evaluation — later revised into a two-dimensional knowledge-by-cognitive-process framework (Anderson & Krathwohl, 2001). The affective taxonomy (Krathwohl et al., 1964) classified objectives concerning attitudes, values, and emotional responses along a continuum of internalization, from mere awareness to a fully characterized value system. The psychomotor domain, left incomplete by Bloom's original team, was independently formalized by Simpson (1972) and Harrow (1972) as a hierarchy of physical skill acquisition from reflexive movement to complex, adaptive, and creative motor performance.

Each domain was a genuine advance for its purpose: giving curriculum designers a shared, ordinal vocabulary for writing and sequencing objectives within a single category of outcome. Crucially, however, the three domains were conceived and published as three separate taxonomies, developed by different teams over nearly two decades, and never integrated into a single account of how a learner deploys cognitive, affective, and physical resources together in an authentic task. Their combination into a single "three-domain model" of holistic learning is a retrospective curricular convention rather than a claim advanced by Bloom and his collaborators, who described each taxonomy as pertaining to its own "domain" of objectives precisely because they were not designed to interact. This is the architecture's origin: three independently constructed classification systems for objectives within a knowledge-and-skill curriculum, subsequently pressed into service as a general theory of holistic development — a role for which it was neither designed nor, as the next section argues, structurally adequate.

Structural Insufficiencies of the Three-Domain Model

The three-domain architecture, examined against the requirements of a fifth-generation, competency-based curriculum, exhibits four structural insufficiencies. These are consolidated in Table 1 and expanded below.

Table 1: Consolidation of Structural Arguments Against the Three-Domain Model

#	Structural Limitation	Nature of the Problem	Key References	Implication for a Seven-Dimension Architecture
1	**Omitted capacities**	Self-regulatory, aesthetic-expressive, sociocultural, and ethical capacities are absent from all three domains	Zimmerman, 2002; Eisner, 2002; Blakemore et al., 2007; Kohlberg, 1984	Seven dimensions restore these as explicit, assessable constructs
2	**Non-interacting silos**	Domains function as parallel classification lists with no account of how they combine in one learner	Bassett & Sporns, 2017; Pessoa, 2008; Immordino-Yang & Damasio, 2007	Dimensions are sequenced as functional preconditions, not parallel tracks

3	**Embodiment misrepresented**	Psychomotor domain treated as a skill track parallel to cognition rather than constitutive of thought	Lakoff & Johnson, 1999; Varela et al., 1991; Piaget, 1952	Embodied dimension repositioned as functionally prior to expressive and social dimensions
4	**Pre-neuroscience origins**	Architecture fixed in the 1950s–1960s predates executive-function and social-cognitive neuroscience	Miyake & Friedman, 2012; Kolskår et al., 2018	Sequencing reflects documented neurodevelopmental maturational gradients
5	**No fifth-generation counterpart**	Three-domain model retrofitted onto competency-based curricula it was not designed for	Rychen & Salganik, 2003	Seven dimensions purpose-built for holistic, policy-aligned curricula

- **Omitted Capacities**

First, the three domains omit entire capacities that contemporary competency frameworks treat as constitutive of whole-person learning. Self-regulatory capacity — the ability to monitor, plan, and adjust one's own learning strategies — is not addressed by any of the three domains, though it is now recognized as a distinct executive system with its own developmental trajectory (Miyake & Friedman, 2012; Zimmerman, 2002) and a documented, effortful, and limited resource (Baumeister & Vohs, 2007). The capacity to render understanding into an aesthetic or expressive form — to compress a competency into a communicable, memorable shape — is likewise absent, despite being treated as a distinct mode of knowing in its own right rather than a decorative addition to cognition (Eisner, 2002). The capacity to reason about the social and civic stakes of knowledge, mediated by a mentalizing network that matures across adolescence (Blakemore et al., 2007; Burnett et al., 2011), has no home in any of the three domains, nor does moral or ethical reasoning, which Kohlberg (1969, 1984) and subsequent researchers have shown to develop through a sequence distinct from either cognitive or affective maturation. A framework that omits self-regulatory, aesthetic-expressive, sociocultural, and ethical capacity cannot certify holistic development, whatever its adequacy within the capacities it does name.

- **Non-Interacting Silos**

Second, even for the domains the architecture does name, it supplies no account of how they interact within a single learner. The three taxonomies were designed, and largely function in curricular practice, as parallel classification lists: a lesson plan cites a cognitive-domain objective, an affective-domain objective, and a psychomotor-domain objective as though these could be pursued and certified independently. Network neuroscience has since documented that learning is an integrative rather than a modular process — that affect, cognition, and action are continuously coupled rather than functionally separable (Bassett & Sporns, 2017; Pessoa, 2008), and that emotional processing is not merely correlated with but partly constitutive of reasoning itself, a relation Immordino-Yang and Damasio (2007) term 'emotional thought.' A three-domain architecture with no account of sequencing or interaction between domains is not a simplification of this integration; it is a structural misrepresentation of it.

- **Embodiment Misrepresented**

Third, the psychomotor domain in particular is misrepresented as a parallel skill track rather than as constitutive of cognition. Embodied-cognition theory holds that sensorimotor engagement partly constitutes thought rather than merely expressing a cognitive competency arrived at independently (Lakoff & Johnson, 1999; Varela et al., 1991; Glenberg, 2010) — a claim with clear developmental precedent in Piaget's (1952) account of sensorimotor intelligence as the foundation of later operational thought. Treating psychomotor achievement as a domain running in parallel to cognitive achievement, rather than as one of its constitutive channels, is therefore not a minor terminological choice but a substantive theoretical error with consequences for how embodied performance is taught and assessed.

- **Pre-Neuroscience Origins**

Fourth, the three-domain architecture predates, by several decades, the neuroscience literatures that now document self-regulatory, social-cognitive, and affective systems as developmentally distinct with their own maturational timetables (Miyake & Friedman, 2012; Kolskår et al., 2018; Blakemore et al., 2007). A framework fixed in the 1950s and 1960s cannot, without revision, reflect research that did not yet exist at the time of its construction. This is not a criticism of Bloom and his collaborators, who worked within the empirical horizon available to them, but it is a reason the architecture requires updating rather than indefinite retrofitting onto curricula it was not designed to serve — including the fifth-

generation, competency-based curricula that India's National Education Policy 2020 and National Curriculum Framework for School Education 2023 now require (Ministry of Education, Government of India, 2020; National Council of Educational Research and Training, 2023).

Toward a Seven-Dimension Architecture

The seven-dimension architecture proposed here — affective, cognitive, executive, embodied, aesthetic-expressive, sociocultural, and ethical — is offered as a theoretical alternative that directly addresses each insufficiency identified in Section 3. It restores the four omitted capacities as explicit dimensions (executive, aesthetic-expressive, sociocultural, ethical) rather than leaving them unmeasured. It replaces the parallel-list structure with an explicit sequencing logic, such that the dimensions are not independent classification categories but functionally ordered capacities, each a precondition for the one that follows. It repositions embodiment as prior to, rather than parallel with, higher-order expressive and social capacities, consistent with embodied-cognition theory. And it draws its sequencing directly from the neurodevelopmental and cognitive-science literatures that postdate Bloom's original taxonomies.

The sequencing logic rests on two parallel gradients: increasing neurobiological complexity, from phylogenetically old subcortical systems to late-maturing prefrontal and social-cognitive networks; and increasing functional complexity, in the sense that each dimension enables a class of learning behavior that presupposes the capacities preceding it. Affect, generated by early subcortical salience systems (Panksepp, 1998), gates what is attended to and encoded, functioning as a form of thought in its own right rather than a mere modulator of it (Immordino-Yang & Damasio, 2007). Cognition then encodes and reasons over what affect has selected (Damasio, 1994). Executive function, among the latest-maturing neural systems (Miyake & Friedman, 2012; Kolskår et al., 2018), converts that knowledge into sustained, self-regulated action, drawing on a limited and effortful regulatory capacity (Zimmerman, 2002; Baumeister & Vohs, 2007). Embodiment then makes the regulated competency physically demonstrable, since thought is partly constituted by sensorimotor engagement rather than simply expressed through it (Piaget, 1952; Lakoff & Johnson, 1999). Aesthetic-expressive form renders the demonstrated competency communicable and memorable by compressing it into a transferable shape (Eisner, 2002). The sociocultural dimension, mediated by a mentalizing network that matures across adolescence (Blakemore et al., 2007; Burnett et al., 2011), then receives and reshapes that communicated competency in social exchange, since higher psychological functions are internalized only once socially enacted (Vygotsky, 1978). Ethical reasoning, requiring perspective-taking beyond formal operational thought (Kohlberg, 1969, 1984), supplies the value-frame within which all prior capacities are ultimately judged and directed. Table 2 consolidates each dimension's construct and theoretical anchors for rapid appraisal.

Theoretical Foundations of the Seven Dimensions

Each dimension draws on an independent theoretical or empirical literature; none was constructed by extending Bloom's taxonomy, and each is defensible on its own terms even before the seven are considered together as a sequence.

Table 2: The Seven-Dimension Architecture: Constructs, Anchors, and Sequencing

#	Dimension	Core Construct	Theoretical Anchor(s)	Sequencing Rationale
1	**Affective**	Motivational orientation and emotional gating of attention and encoding	Panksepp, 1998; Immordino-Yang & Damasio, 2007; Wigfield & Eccles, 2000	Precursor: gates what is attended to and encoded
2	**Cognitive**	Comprehension, structural integration, and reasoning over encoded content	Bloom et al., 1956; Anderson & Krathwohl, 2001	Encodes and reasons over what affect has selected
3	**Executive**	Metacognitive knowledge and self-regulated, sustained action	Miyake & Friedman, 2012; Zimmerman, 2000, 2002; Baumeister & Vohs, 2007	Converts knowledge into sustained, self-regulated action
4	**Embodied**	Sensorimotor enactment as constitutive of, not parallel to, thought	Piaget, 1952; Lakoff & Johnson, 1999; Varela et al., 1991	Makes regulated competency physically demonstrable
5	**Aesthetic-Expressive**	Compression of competency into a communicable, memorable form	Eisner, 2002	Renders demonstrated competency communicable and memorable

6	**Sociocultural**	Reasoning about social/civic stakes; competency reshaped through social exchange	Vygotsky, 1978; Blakemore et al., 2007; Eyler & Giles, 1999	Receives and reshapes competency in social exchange
7	**Ethical**	Moral reasoning and perspective-taking beyond formal operations	Kohlberg, 1969, 1984; Haidt, 2012; Toulmin, 1958	Supplies the value-frame judging all prior capacities

The affective dimension draws on affective neuroscience's account of subcortical salience and motivational systems (Panksepp, 1998) and on the affective-neuroscience critique of a strict emotion–cognition divide (Immordino-Yang & Damasio, 2007), together with expectancy-value theory and self-determination theory's accounts of engagement (Wigfield & Eccles, 2000; Ryan & Deci, 2000). The cognitive dimension draws on Bloom's own taxonomy (Bloom et al., 1956) as revised and reorganized (Anderson & Krathwohl, 2001), retained here as the empirically best-established of the seven. The executive dimension draws on the cognitive-neuroscience literature on executive function as a distinct, late-maturing system (Miyake & Friedman, 2012; Kolskår et al., 2018), on metacognitive theory's distinction between strategy knowledge and regulation (Flavell, 1979; Veenman et al., 2006), and on self-regulated-learning theory (Zimmerman, 2000, 2002; Baumeister & Vohs, 2007). The embodied dimension draws on embodied-cognition and enactivist theory (Lakoff & Johnson, 1999; Varela et al., 1991; Glenberg, 2010) and on Piaget's (1952) developmental account of sensorimotor intelligence. The aesthetic-expressive dimension draws on Eisner's (2002) account of the arts as a distinct mode of knowing not reducible to verbal-propositional cognition. The sociocultural dimension draws on Vygotsky's (1978) sociocultural theory of the internalization of higher psychological functions and on developmental social neuroscience's account of the maturing mentalizing network (Blakemore et al., 2007; Burnett et al., 2011), together with evidence that authentic civic and social reasoning contributes to identity formation (Eyler & Giles, 1999; Youniss & Yates, 1997). The ethical dimension draws on Kohlberg's (1969, 1984) stage theory of moral development, on pluralist accounts of moral foundations (Haidt, 2012), and on the structure of practical argument (Toulmin, 1958).

Necessity and Holistic Usefulness of the Transition

- **Necessity**

The necessity of this transition follows from a simple observation: a curriculum that has already moved to a competency-based, holistic aim cannot be adequately served by an evaluative architecture that neither names all the capacities that aim requires nor accounts for how they combine. This is not merely an academic concern. India's National Education Policy 2020 makes holistic development the explicit aim of school education, and the National Curriculum Framework for School Education 2023 operationalizes this aim through the Pañcakoś Vikas model — a five-sheath account of physical, life-energy, mental-emotional, intellectual, and reflective-spiritual development (National Council of Educational Research and Training, 2023). What this policy asserts, the seven-dimension architecture supplies as a compatible, independently derived theoretical structure: both converge on the claim that human development is irreducibly multi-layered and that no single layer, or pair of layers, is an adequate proxy for the whole. This convergence, arrived at from an Indological philosophical tradition on one side and cognitive and developmental science on the other, is treated here as substantively significant rather than coincidental, though the two frameworks are not proposed as isomorphic, and a detailed mapping between the seven dimensions and the five sheaths remains a task for further theoretical work.

The necessity is sharpened further by what continued reliance on the three-domain model costs in practice. Where curriculum documents retain the three domains as their organizing vocabulary, self-regulatory, aesthetic-expressive, sociocultural, and ethical objectives tend either to disappear from assessment altogether or to be folded imprecisely into whichever of the three domains seems closest — executive self-monitoring reported as a cognitive-domain skill, ethical reasoning reported as an affective-domain disposition. Each such accommodation is a category error that obscures rather than measures the capacity in question, and each accumulates as the gap between policy aim and evaluative practice widens.

- **Holistic Usefulness**

The holistic usefulness of the seven-dimension architecture follows from what it makes visible that the three-domain model cannot. A curriculum or assessment system organized around three domains has no vocabulary for a learner's self-regulatory capacity, aesthetic-expressive fluency,

sociocultural reasoning, or ethical development — these either go unassessed or are folded imprecisely into the cognitive or affective domains, where they are poorly served by those domains' own construct definitions. A seven-dimension architecture gives each of these capacities an explicit theoretical home, and its sequencing logic further gives curriculum designers a principled basis for deciding which capacities to build first: affective engagement and cognitive understanding before self-regulated executive control, embodied enactment before aesthetic-expressive rendering, and sociocultural exchange before the ethical reasoning that ultimately judges all prior capacities. This ordering is itself a practical, not merely descriptive, contribution: it offers a developmental sequence for holistic curriculum design, not only a taxonomy for post hoc classification of objectives.

The architecture is also diagnostically useful in a way the three-domain model cannot be. Because the seven dimensions are theorized as functionally sequenced rather than merely listed, a profile that is strong in early dimensions (affective engagement, cognitive comprehension) but weak in later ones (executive regulation, ethical reasoning) is informative in a way no combination of three parallel domain scores could be: it locates where in the developmental sequence a learner's competency currently breaks down, rather than simply reporting three unrelated numbers. This diagnostic structure is what makes the seven-dimension model useful for holistic pedagogy and not only for holistic description.

Theoretical Status and Limitations

This article has argued for the seven-dimension architecture as a theoretical alternative to Bloom's three domains, not as an empirically validated replacement for them. Three qualifications follow. First, the seven-dimension count is a theoretical claim, derived from the convergence of several independent literatures, and it remains open to revision through factor-analytic or other empirical work that might reveal a different underlying structure. Second, the sequencing logic, while grounded in documented neurodevelopmental gradients, is a proposed ordering rather than a demonstrated causal chain; the claim that each dimension is a functional precondition for the next is a testable hypothesis, not an established finding. Third, the cognitive dimension's theoretical grounding remains substantially indebted to Bloom's own taxonomy, which this article retains rather than discards — the argument is for supplementing and re-sequencing Bloom's architecture, not for erasing its genuine contribution to the cognitive dimension specifically.

The seven-dimension architecture should accordingly be read as a structurally motivated synthesis inviting empirical scrutiny, in the same spirit that Bloom's own taxonomies were revised, extended, and reorganized over subsequent decades (Anderson & Krathwohl, 2001) rather than treated as fixed upon first publication. Readers grounded in any one of the literatures drawn upon here — affective neuroscience, embodied cognition, developmental moral psychology, or Vedantic philosophy — may reasonably contest details of how their literature has been represented; the synthesis is offered as an integration to be tested and refined, not a closed account.

Conclusion

Bloom's three-domain architecture was a genuine achievement for the knowledge-and-skill curriculum it was built to classify, but it was neither designed for, nor structurally adequate to, the holistic, competency-based curriculum that education has since moved toward. This article has identified four structural insufficiencies in the three-domain model — omitted capacities, non-interacting silos, misrepresented embodiment, and pre-neuroscience origins — and has proposed a seven-dimension architecture, sequenced along parallel gradients of neurobiological and functional complexity, as a theoretical alternative that addresses each. The transition from domains to dimensions is necessary because contemporary educational policy already requires what the three-domain model cannot supply, and it is holistically useful because it gives self-regulatory, aesthetic-expressive, sociocultural, and ethical capacities an explicit theoretical home alongside cognition and affect, together with a developmental sequence for building them. The seven-dimension architecture is offered here as a theoretical proposal awaiting the empirical validation that alone can establish whether its structure and sequencing hold as designed — the necessary next step in the transition this article argues for.

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