WHAT SHOULD BE LEARNED

The Aims of Education Across Philosophy, Evidence, and Culture

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1

FRAMING THE QUESTION

What should a person know, be able to do, and be disposed toward by the time they reach adulthood? This is the most fundamental question in education — logically prior to questions about how learning works, how teaching should proceed, or how institutions should be organized. Every educational system, whether it makes its reasoning explicit or not, embodies an answer. The purpose of this investigation is to examine what answers exist, how well-supported they are, and what a curriculum designer can build on.

The question is partly empirical and partly normative. The empirical part asks: what knowledge, skills, and dispositions actually predict adult flourishing — health, financial stability, satisfying relationships, meaningful work, civic participation? Longitudinal research has something to say about this, though less than one might hope, and the most important recent evidence complicates the popular narrative in ways the v1 review did not address. The normative part asks: what *counts* as flourishing? What kind of life is a good life? Here we leave the domain of science and enter philosophy, culture, and values. There is no experiment that can tell us whether Nussbaum's capabilities or Dewey's growth or Freire's liberation or the Confucian tradition of self-cultivation is the right framework. But that does not mean all frameworks are equally well-considered. Some are more rigorous, more cross-culturally robust, and more empirically grounded than others. Finding them — and identifying what they converge on — is the work of this review.

A secondary question gives this investigation urgency: how does the answer change when artificial intelligence restructures the economy and the nature of knowledge work? Since the v1 review was written, a body of post-2022 empirical evidence has emerged — field experiments with knowledge workers, labor market exposure analyses, experimental studies of AI-assisted learning — that transforms what was previously informed speculation into something closer to evidence-based reasoning. The picture that emerges is more nuanced and in some respects more alarming than what v1 could offer.

This review proceeds in ten sections. We begin with the philosophical foundations — an expanded treatment that engages twelve distinct traditions, six of which were absent from v1, including the analytic philosophy of education (Peters, Hirst), the Aristotelian virtue tradition (Kristjánsson, Darnell), the radical critique (Illich), and the Confucian tradition of self-cultivation (Tu Weiming). We then examine the empirical evidence, now substantially enriched by the psychology of flourishing (Seligman, Vaillant, Ryan and Deci, Ryff, Keyes) and by a more honest treatment of the self-regulation evidence, including the marshmallow test replication controversy. We survey curriculum theory — now informed by the sociology of knowledge (Bernstein, Apple, Chevallard) and the convergence between the German Bildung tradition and the British "powerful knowledge" movement. We address the knowledge-versus-skills debate, which resolves more cleanly than the policy wars suggest once cognitive science and curriculum sociology are taken seriously. We examine cross-cultural evidence — national curricula from Finland, Singapore, Japan, and the OECD, and philosophical traditions from Confucian China, the French *didactique*, and the German *Bildung* — asking whether there is a defensible cross-cultural core or whether the answer is irreducibly local. We identify what the frameworks converge on, what remains genuinely contested, and what the AI transition changes. We close with an assessment of what a curriculum designer at Applied Pedagogy can confidently build on, and what remains for the Principal Investigator to decide on the basis of values rather than evidence.

Throughout, every claim carries a provenance tag. Claims marked *Verified (direct)* rest on primary texts read in this session. Claims marked *Verified (via PI summary)* rest on detailed book summaries produced by the lab's summarization pipeline. Claims marked *Abstract-verified* rest on abstracts or TLDRs. Claims marked *Training-derived* come from the agent's training knowledge and have not been verified against the source in this session. The provenance breakdown is reported in 'changelog.md'. This is not an exercise in false precision — it is a commitment to letting the reader calibrate trust claim by claim.

One final note on the nature of this review. The v1 version was approximately 9,500 words and engaged thirty-two sources, almost all at Training-derived provenance. This v2 review is the product of reading sixty-eight sources, the majority at Verified (direct) provenance, including sixteen books read in full or substantial part, thirty-four academic papers, five practitioner sources subjected to systematic gap-detection analysis, four national curriculum documents, and eight new sources from the psychology of flourishing. It is longer not because length is the goal but because depth is, and the question it addresses — what should a person learn? — is arguably the hardest in the research program. The other nine agents in this wave ask "how does learning work?" and "how should we teach?" This one asks "learn *what*?" and "teach *toward what*?" It is logically prior to all of them, and the answer must be as honest as we can make it about both what we know and what remains irreducibly a matter of values.

2

THE PHILOSOPHICAL FOUNDATIONS

The question "what should be learned?" has been asked by every serious philosophical tradition, and answered with more convergence than one might expect given the depth of the cultural and methodological differences involved. This section examines twelve sources across seven distinct philosophical traditions, organized not as sequential summaries but as a conversation among positions that illuminate each other's strengths and blind spots.

2.1 2.1 THE CAPABILITIES APPROACH: WHAT MUST A PERSON BE ABLE TO DO AND BE?

Martha Nussbaum's capabilities approach, developed from the economic foundations laid by Amartya Sen, provides the most systematic philosophical answer to the question "what should education produce?" Sen's original argument was that development should be understood as the expansion of human freedoms — "substantive freedoms" or capabilities — rather than growth in GDP or income (Sen, 1999, Ch. 1)◑. The approach begins with a question that is deceptively simple: what is each person actually able to do and to be? It shifts attention from aggregates — GDP, test scores, national rankings — to individuals, and from resources to the freedoms those resources enable (Nussbaum, 2011, Ch. 2)●.

Nussbaum distinguishes three levels of capability. *Basic capabilities* are innate endowments — the raw material of development. *Internal capabilities* are developed traits and abilities — what education most directly cultivates. *Combined capabilities* are internal capabilities plus the external conditions that allow their exercise. A person who has been educated to think critically but lives in a society that punishes dissent lacks the combined capability of free thought. Education's primary contribution is to internal capabilities, but Nussbaum insists that internal capability without the social conditions for its exercise is insufficient for a life of dignity (Nussbaum, 2011, Ch. 2)●.

Her list of ten Central Capabilities — Life, Bodily Health, Bodily Integrity, Senses/Imagination/Thought, Emotions, Practical Reason, Affiliation, Other Species, Play, and Control over One's Environment — represents a minimum threshold for a dignified human life. For education, capabilities 4 (Senses, Imagination, and Thought), 6 (Practical Reason), and 7 (Affiliation) are most directly relevant. Capability 4 explicitly references education: a person should be able to use the senses, to imagine, think, and reason "in a way informed and cultivated by an adequate education, including, but by no means limited to, literacy and basic mathematical and scientific training" (Nussbaum, 2011, Ch. 2)●. Capability 6 — forming a conception of the good and engaging in critical reflection about one's life — describes what many traditions recognize as the ultimate purpose of education: autonomous practical reasoning.

Three features of the approach are especially important for curriculum design. First, capabilities are *irreducibly heterogeneous*: a nation cannot satisfy one by providing more of another. Literacy cannot substitute for practical reason; knowledge cannot substitute for affiliation or play. This means a curriculum that develops cognitive capability at the expense of social or emotional capability has failed on the approach's own terms (Nussbaum, 2011, Ch. 2)●. Second, Nussbaum identifies *fertile functionings* — capabilities like affiliation and credit access that cascade positively across other domains — and *corrosive disadvantages* that cascade destructively. A curriculum designer should

identify and prioritize the educational fertile functionings: the foundational competencies that unlock access to all others (Nussbaum, 2011, Ch. 2)●. Third, the concept of *adaptive preferences* means satisfaction-based metrics are invalid for evaluating curricula: people denied educational opportunities often stop wanting them, so their reported satisfaction cannot validate the adequacy of what they received (Nussbaum, 2011, Ch. 3)●.

Ingrid Robeyns's *Wellbeing, Freedom and Social Justice* (2017) provides the most rigorous meta-level analysis of the capabilities framework. Robeyns demonstrates that the capability approach is modular: an A-module (the core framework — evaluate states of affairs in terms of what people can do and be) is common to all versions, while the B-module (which capabilities? whose list?) and C-module (applied to which domain?) vary. This modularity means a curriculum designer can use the capability framework without inheriting all of Nussbaum's specific commitments — and without accepting Sen's refusal to specify any list at all (Robeyns, 2017, Chs. 3–4)●. Robeyns also introduces *conversion factors* — personal, social, and environmental features that determine whether resources translate into capabilities. Two students receiving the same instruction may develop different capabilities depending on their health, family support, and institutional context. This has direct implications for curriculum equity: identical inputs do not produce identical capabilities (Robeyns, 2017, Ch. 2)●.

The capabilities approach has significant limitations. Sen himself resists any fixed list, arguing that democratic deliberation must determine which capabilities matter — and that a theorist's list, however well-intentioned, forecloses the political process through which communities should make these decisions (Sen, 1999, Ch. 3)◑. The ten capabilities are described at a level of abstraction that does not translate directly into curriculum: "being able to form a conception of the good" does not tell a teacher what to teach on Monday morning. The gap between philosophical framework and curricular specificity must be bridged by other tools — curriculum theory, institutional design, teacher judgment — and the capabilities approach does not provide those tools. The cultural-specificity critique remains unresolved: despite Nussbaum's argument that the capabilities reflect cross-cultural consensus rather than Western values (Nussbaum, 2011, Ch. 5)●, the emphasis on individual autonomy and political participation sits uneasily with traditions that locate personhood in relational rather than individual terms.

2.2 2.2 DEWEY, PETERS, AND THE ANALYTIC TRADITION: WHAT DOES "BEING EDUCATED" MEAN?

John Dewey's *Democracy and Education* (1916) takes a fundamentally different approach to educational aims. Where Nussbaum specifies what education should produce, Dewey resists specification. His central claim is that the aim of education is to enable individuals to continue their education — that "the object and reward of learning is continued capacity for growth" (Dewey, 1916, Ch. 4)●. This is not evasion but a principled position: any aim imposed from outside the educational process will be distorting, because it substitutes external authority for the learner's own intelligent activity.

Dewey's concept of growth is richer than it first appears. Growth requires *plasticity* — "the ability to learn from experience; the power to retain from one experience something which is of avail in coping with the difficulties of a later situation" (Dewey, 1916, Ch. 4)●. It also requires democratic community: "Not only is social life identical with communication, but all communication (and hence all genuine social life) is educative" (Dewey, 1916, Ch. 1)●. Education is not preparation for democratic life; it *is* democratic life, practiced in miniature.

R. S. Peters's *Ethics and Education* (1966) sharpens the question considerably. Peters argues that "education" is not a neutral descriptive term but a normative one — to call a process "education" implies that something worthwhile is being transmitted, that the learner is developing a cognitive perspective (not merely acquiring habits), and that the process is conducted with the learner's voluntary engagement rather than through coercion. His three criteria for education are among the most precise in the philosophical literature: the transmission of something worthwhile, the development of knowledge and understanding (not merely skill or habit), and the use of morally acceptable methods that respect the learner's developing agency (Peters, 1966, Ch. 1)●. Training a person to perform a task efficiently is not educating them unless they understand *why* they are doing it and can situate their activity within a broader cognitive framework.

Peters adds a further criterion that is directly relevant to the competence stack: an educated person is one who is "on the inside" of knowledge — who not only possesses it but *cares* about the standards of evidence and inquiry that govern it. Knowledge that is merely held, without the disposition to use it well and extend it honestly, is not education's product. This cognitive-perspective requirement bridges the gap between knowledge (Layer 1 of the competence stack) and character (Layer 5): genuine education produces not just competence but the disposition to exercise competence with intellectual integrity (Peters, 1966, Ch. 1)●.

Paul Hirst's *Knowledge and the Curriculum* (1974) provides the most direct philosophical answer to "what must a curriculum contain?" Hirst argues that the mind is not a general-purpose instrument that can be trained through any content; rather, it is constituted by logically distinct "forms of knowledge" — each with its own concepts, truth criteria, and methods of inquiry. His original list includes mathematics, physical sciences, human sciences, history, religion, literature and the fine arts, and philosophy. A person who has not been initiated into these forms has not developed the full range of rational understanding that constitutes an educated mind (Hirst, 1974)●.

Crucially for the knowledge-skills debate, Hirst argues that "one cannot, in pursuing the ability to solve scientific problems, assume one is thereby pursuing the ability to solve moral problems or historical problems as well." Each form has its own logic, and competence in one does not transfer to others (Hirst, 1974)●. This is the same conclusion that cognitive science would reach fifty years later through Willingham's work on domain-specificity — arrived at through philosophical analysis rather than experimental evidence.

Alfred North Whitehead's *The Aims of Education* (1929) contributes a concept that every curriculum designer should internalize: *inert ideas* — "ideas that are merely received into the mind without being utilised, or tested, or thrown into fresh combinations" (Whitehead, 1929)●. Knowledge that sits in memory without being activated is worse than useless; it is actively harmful because it breeds mental habits of passivity. Whitehead's alternative is education that produces *style* — "the ultimate morality of mind," the capacity to deploy knowledge with elegance, economy, and purpose. "Style, in its finest sense, is the last acquirement of the educated mind; it is also the most useful" (Whitehead, 1929)●. This anticipates the competence stack's distinction between Layers 1–2 (knowledge and skill) and Layers 3–5 (judgment, metacognition, character): knowing and doing are necessary but insufficient without the quality of deployment that Whitehead calls style and the competence stack calls judgment.

The tension between Dewey and Peters is productive. Dewey resists specifying aims; Peters insists that education *logically entails* something worthwhile. But they agree that education is more than the transmission of content, that it requires the development of a cognitive perspective and the disposition to use knowledge well, and that its success is measured not by what students can recite but by who they become. A curriculum designer who takes both seriously will resist reducing education to a content list while insisting that the specific content chosen must be genuinely worthwhile — not in a market sense but in the sense of developing rational understanding.

2.3 2.3 FREIRE, ILLICH, AND THE RADICAL CRITIQUE

Paulo Freire's *Pedagogy of the Oppressed* (1970) adds a dimension that neither Nussbaum, Dewey, nor Peters foregrounds: the political question of whose interests educational aims serve. "There is no such thing as a neutral educational process. Education either functions as an instrument that is used to facilitate the integration of the younger generation into the logic of the present system and bring about conformity to it, or it becomes 'the practice of freedom,' the means by which men and women deal critically and creatively with reality and discover how to participate in the transformation of their world" (Freire, 1970, Shaull foreword)•.

Freire's critique of "banking education" — the teacher deposits knowledge into passive student-receptacles — is not merely pedagogical but political. The banking concept trains people to adapt to existing reality rather than to question and transform it. For Freire, the aim of education is *conscientização* — the development of critical consciousness, the capacity to perceive social, political, and economic contradictions and to take action against oppressive elements of reality. Whatever is learned should develop the learner's capacity to read the world critically and act to transform it. This is not "critical thinking" in the generic sense but critical engagement with power (Freire, 1970, Ch. 2)•.

Freire insists that genuine knowledge is *praxis* — "the radical interaction of reflection and action." "There is no true word that is not at the same time a praxis. Thus, to speak a true word is to transform the world" (Freire, 1970, §3.0.2)•. Knowledge divorced from the capacity for transformative action is not genuine knowledge. This parallels — from a radically different starting point — the Confucian tradition's insistence that knowing and acting are unified rather than sequential.

Ivan Illich's *Deschooling Society* (1971) radicalizes Freire's critique. Where Freire argues for transforming education, Illich argues that compulsory schooling is itself the problem — not because schools teach the wrong content but because their structure systematically converts intrinsic human capacities into institutional dependencies. Schools teach people that they cannot learn without a teacher, that knowledge is a commodity dispensed by certified professionals, and that learning must be measured by institutions to be real. "The pupil is thereby 'schooled' to confuse teaching with learning, grade advancement with education, a diploma with competence, and fluency with the ability to say something new" (Illich, 1971, Ch. 1)•.

Illich's concept of the *hidden curriculum* extends beyond the well-known observation that schools teach compliance and hierarchy. He argues that schools function as the "reproductive organ of a consumer society," teaching people to value institutional products over self-directed activity across all domains of life — health, transportation, housing, not just education. "The escalation of the schools is as destructive as the escalation of weapons but less visibly so" (Illich, 1971, Ch. 1)•.

The radical critique must be taken seriously, but it also has limits. Freire's framework provides no empirical evidence for conscientization's effects; the concept is not operationalized in any measurable way. Illich's argument that schools should be replaced by voluntary "learning webs" ignores the distributional question: Bernstein's sociology of education shows that informal learning reproduces social inequality *more* sharply than formal schooling, not less, because middle-class families transmit the recognition and realization rules that make self-directed learning productive while working-class families do not (Bernstein, 2000, Ch. 4)•. Deschooling benefits the already-advantaged precisely because they already possess the cultural capital that formal schooling was designed to distribute. This does not invalidate Illich's structural critique of credentialism — which the practitioner literature (80,000 Hours, the rationality community) echoes in contemporary language — but it limits the radical prescription. The question is not whether to have educational

institutions but how to design them so they develop genuine competence rather than institutional dependency.

2.4 2.4 THE ARISTOTELIAN VIRTUE TRADITION

Kristján Kristjánsson's *Aristotelian Character Education* (2015) provides the most sophisticated contemporary integration of moral philosophy, developmental psychology, and educational practice relevant to the question of what education should produce. Kristjánsson argues that the Aristotelian framework offers something no other tradition does: a unified account of how moral character develops, what it consists of when mature, and why it matters for human flourishing — all grounded in a theory of practical wisdom (*phronesis*) that maps directly onto the competence stack's Layer 3 (judgment) and Layer 5 (character).

The Aristotelian account of character formation runs through three stages. First, *habituation*: the young person develops behavioral dispositions through practice, guided by exemplars and social norms. Second, *cognitive refinement*: the habituated dispositions are integrated with rational understanding, so the person not only acts well but understands *why* the action is good. Third, the development of *phronesis* — practical wisdom, the capacity to perceive what a situation requires, deliberate about the right response, and act on that deliberation reliably and with the right emotional engagement. The *phronimos* — the person of practical wisdom — does not merely know the right thing; they perceive it, feel it, and do it with an ease that reflects deep integration of perception, emotion, and action (Kristjánsson, 2015, Ch. 2)●.

Catherine Darnell and colleagues' synthesis, "Phronesis and the Knowledge-Action Gap" (2019), provides the empirical grounding that Kristjánsson's philosophical account needs. They show that moral knowledge alone explains only about 10% of the variance in moral behavior — a finding from Augusto Blasi's integration of over 100 studies. The gap between knowing what is right and doing what is right is the defining problem of moral education, and neither Kohlberg's "motivational internalism" (knowledge is sufficient for action) nor appeals to moral identity or moral emotions alone can close it. Phronesis — as a multi-component construct integrating perception, deliberation, and emotional attunement — is the best current candidate for bridging the knowledge-action gap, though the developmental psychology of how phronesis actually develops is the acknowledged weakest link in the research program (Darnell et al., 2019)●.

The Aristotelian tradition's contribution to the "what should be learned?" question is not a content list but a structural claim: education must produce not just knowledge but the practical wisdom to deploy knowledge well, and practical wisdom is not a generic capacity but is constituted through habituation, refined through experience, and integrated through deliberate reflection on practice. This converges with Dewey (intelligent activity directed by foresight), with Peters (the cognitive perspective criterion), with Whitehead (style as the ultimate morality of mind), and — most strikingly — with the Confucian tradition's insistence on the unity of knowing and acting.

A critical qualification: Kristjánsson counsels "hopeful modesty" about character education's current evidence base. The evidence for reliable character development through formal schooling is real but more modest than advocates claim. And the situationist critique from social psychology — that behavior is overwhelmingly situation-determined and that stable character traits may be a fiction — must be addressed. Kristjánsson responds that situationist evidence comes primarily from studies of strangers in extraordinary situations, not from the slow formation of habituated dispositions in familiar contexts that Aristotelian character education describes (Kristjánsson, 2015, Ch. 5)●. The evidence for character development is weaker than enthusiasts claim but stronger than skeptics allow.

2.5 2.5 THE CONFUCIAN TRADITION: SELF-CULTIVATION AS EDUCATION

Tu Weiming's *Humanity and Self-Cultivation* (1979) provides the most sustained English-language engagement with the Confucian educational tradition, and its inclusion in this review corrects the most significant philosophical gap in v1. The Confucian tradition offers not a supplementary non-Western perspective but a genuinely alternative philosophical foundation — one that locates the aims of education in a different ontology of the self.

The core concept is *hsiu-shen* — self-cultivation — and it rests on the structural inseparability of personal moral development, social engagement, and cosmic participation. The educated person in the Confucian tradition is one who has internalized *jen* (humaneness, the inner moral principle) and expresses it through *li* (ritual propriety, its concrete social form). Neither can exist authentically without the other: moral feeling without social form is mere sentiment; social form without moral feeling is empty conformity (Tu, 1979, Ch. 2)●.

Three features of the Confucian tradition are irreducible to Western frameworks. First, the self is constitutively relational. Western liberal philosophy — from Locke through Rawls through Nussbaum — posits a self that pre-exists its social relationships. The Confucian tradition makes self-cultivation inseparable from relational practice: "it is inconceivable that self-cultivation can be isolated from human-relatedness" (Tu, 1979, Ch. 2, p. 28)●. The moral development sequence from the *Great Learning* — personal cultivation → familial regulation → state ordering → world peace — is not merely sequential but mutually constitutive. One becomes oneself *through* specific relationships, not prior to them.

Second, knowing and acting are unified rather than sequential. Wang Yang-ming's *chih-hsing ho-i* (unity of knowing and acting) is not a pedagogical technique but a metaphysical claim: "Knowing is the beginning of acting; acting is the completion of knowing." Genuine knowledge of the good is inseparable from acting on it; if you know cruelty is wrong and still act cruelly, you did not really know it (Tu, 1979, Ch. 5)●. This reframes what academic education can accomplish: propositional knowledge that does not transform action is not knowledge in the fullest sense. No Western framework makes this claim with the same metaphysical force, though Freire's concept of praxis and Aristotle's account of phronesis approach it from different directions.

Third, the Confucian tradition holds that moral development is not installation but cultivation. Mencius's four moral sprouts — commiseration, shame, deference, and moral discernment — are innate, and education's task is to cultivate what is already latent: "humanity, righteousness, propriety, and wisdom are not drilled into us from outside. We originally have them with us" (*Mencius* 6A.6, via Tu, 1979, Ch. 4, p. 65)●. The famous Ox Mountain allegory illustrates this: the moral sensibility is like vegetation on a mountain that is repeatedly cut down and grazed, until the mountain appears barren — yet the root system persists, and "the power for rejuvenation can never be completely suppressed" (Tu, 1979, Ch. 4)●. This is a fundamentally optimistic view of human moral potential that converges with Nussbaum's "basic capabilities" and Dewey's insistence that immaturity is a "positive capacity" rather than a deficiency.

The Confucian tradition's educational implications are radical: if moral formation cannot be separated from the texture of everyday life — who you eat with, how you greet people, how you maintain your household — then moral education cannot be scheduled as a discrete period in the school day. It must permeate the entire institutional culture. This has direct practical significance for curriculum design and finds its most developed contemporary expression in Japan's *tokkatsu* model, where character formation occurs through cleaning, serving lunch, group governance, and shared institutional life rather than through dedicated moral instruction.

2.6 2.6 WHAT THE PHILOSOPHICAL TRADITIONS CONVERGE ON

Despite real differences in ontology, methodology, and cultural context, the twelve philosophical sources examined in this review exhibit a striking pattern of convergence on six points. This convergence deserves serious attention precisely because it emerges from traditions that developed independently and rarely cite each other.

First, education must produce active competence, not inert knowledge. This is the single most robust cross-traditional finding. Whitehead condemns "inert ideas" — knowledge that is "above all things, harmful" if merely received without being utilized, tested, or recombined. Peters insists that being educated means being "on the inside" of knowledge — not merely possessing it but caring about its standards of inquiry. Freire attacks the banking model for depositing knowledge students cannot use to transform their worlds. Dewey calls education "the art of the utilisation of knowledge." Wang Yang-ming declares that knowing and acting are inseparable by definition. Darnell and colleagues show empirically that moral knowledge alone explains only 10% of moral behavior. Kristjánsson describes the *phronimos* as someone whose virtuous action flows from integrated perception, emotion, and habit — not from applied theoretical knowledge. This convergence spans Western analytic philosophy, Continental critical theory, American pragmatism, Confucian classical philosophy, and contemporary empirical moral psychology. It is one of the most robustly multi-traditional findings available.

Second, education is irreducibly normative — there is no neutral curriculum. Peters argues that the concept of education *logically entails* something worthwhile; there is no value-free account of being educated. Freire insists that every curriculum either integrates learners into the existing system or enables them to transform it. Nussbaum's capability list is an explicit normative commitment. Illich reveals that the hidden curriculum operates normatively regardless of explicit content. Robeyns confirms that the capability approach is fundamentally a theory of the good, not a neutral descriptive framework, and that collective capabilities — goods that are irreducibly communal rather than individual — are a genuine category requiring their own analysis (Robeyns, 2017, Ch. 6)●. The implication for Applied Pedagogy: there is no escape from making explicit normative commitments about what human flourishing requires. The only question is whether those commitments are made openly and defended, or made silently and naturalized.

Third, the knowledge-action gap is the central problem. This convergence runs across traditions that never cite each other. Darnell and colleagues document that Kohlberg's motivational internalism fails: knowing the right thing does not reliably produce doing the right thing. Aristotle (via Kristjánsson) argues that phronesis is required to bridge the gap. Wang Yang-ming (via Tu Weiming) insists that the unity of knowing and acting is a normative ideal, not an empirical description — precisely because the gap between them is the problem to be overcome. Freire's concept of praxis defines genuine learning as reflection-and-action together, either alone being deficient. Dewey argues that habits must be intelligent dispositions that "actively seek occasions to pass into full operation." This convergence directly grounds the competence stack's architecture: Layers 1–2 (knowledge and skill) are insufficient without Layers 3–5 (judgment, metacognition, character).

Fourth, human beings are malleable and educable. Nussbaum: "basic capabilities are the innate faculties of the person that make later development and training possible." Mencius via Tu Weiming: the four moral sprouts are innate; environment can suppress but never wholly destroy the capacity for goodness. Dewey: immaturity is a "positive capacity," not a deficiency; plasticity is the foundational educational resource. Kristjánsson: "hopeful modesty" — the evidence for character development is real, if more modest than advocates claim. This optimism about human development is not universal — the situationist critique in social psychology challenges it, and

Illich's structural analysis suggests that institutions may degrade rather than develop human capacities. But the philosophical consensus is that education is possible because people are developable, and this developmental optimism is a precondition for any curriculum project.

Fifth, self-formation is social and relational. Tu Weiming: "it is inconceivable that self-cultivation can be isolated from human-relatedness." Nussbaum: affiliation is a "fertile functioning" that supports capability-formation across all areas. Freire: dialogue — the medium of genuine education — requires love for the world and for other people. Dewey: "society exists in transmission, in communication." Robeyns: collective capabilities are a genuine category; some educational goods are irreducibly communal. The educated person across all these traditions is not a solitary intellect but a person embedded in relationships through which their capabilities are developed and exercised.

Sixth, competence is domain-specific, not general. Hirst argues that each form of knowledge has its own concepts, truth criteria, and methods of inquiry, and that "one cannot, in pursuing the ability to solve scientific problems, assume one is thereby pursuing the ability to solve moral problems or historical problems as well" (Hirst, 1974)●. Dewey: "there is no such thing as an ability to see or hear or remember in general." Darnell and colleagues: phronesis is "context-sensitive" and "domain-specific," not a global decontextualized wisdom. Kristjánsson: virtues form "dispositional clusters" in "significant and distinguishable spheres of human life." This convergence across analytic philosophy, pragmatism, and contemporary virtue psychology is the strongest available multi-traditional argument against generic "21st-century skills" curricula — and it aligns precisely with the cognitive science evidence that Willingham synthesizes.

2.7 2.7 WHERE THE TRADITIONS GENUINELY DISAGREE

Five disagreements among these traditions are not resolvable by further evidence; they reflect deep philosophical differences that a curriculum designer must navigate rather than resolve.

The degree of specification. Nussbaum specifies ten capabilities. Peters specifies three criteria for education. Hirst specifies seven forms of knowledge. Dewey specifies only "continued capacity for growth." Freire specifies only "critical consciousness." The disagreement is about whether educational aims should be specified by a theorist or left to democratic deliberation. This is a question about political epistemology: can a philosopher legitimately determine what all people should learn, or must every specification emerge from community process? Applied Pedagogy must take a position on this spectrum.

Individual versus relational as the unit of concern. Nussbaum, Sen, and Peters treat the individual as the primary unit of educational concern, even when they acknowledge social interdependence. Tu Weiming's Confucian tradition makes the self constitutively relational — separating individual cultivation from family and social engagement is "inconceivable." Freire insists that individual liberation is impossible outside collective struggle. This disagreement goes to foundational ontology — whether persons are prior to their social relations or constituted by them — and has major practical implications for whether cooperative and communal learning structures are incidental or essential.

Whether compulsory schooling is reformable. Most traditions assume schools are the appropriate vehicle for education. Illich argues that the structure of compulsory schooling — not its content — is counterproductive, and that no reform can fix an institution whose hidden curriculum produces institutional dependency. The empirical evidence on distributional effects favors the reformist position for disadvantaged learners, but Illich's structural critique retains force as a diagnosis of how schools serve advantaged learners.

Whether moral character can be deliberately cultivated. Kristjánsson and Darnell say yes, with appropriate modesty. Illich says institutional schooling *cannot* cultivate genuine character. Situationist psychology questions whether stable character traits even exist. The honest position: the evidence for reliable character cultivation through formal schooling is weaker than advocates claim but stronger than situationists allow.

The nature of educational value. Peters treats educational aims as intrinsic goods — intellectual development is what education *is*, not what it produces. Sen treats education as both intrinsically and instrumentally valuable — as a freedom that matters in itself and as a means to expand other freedoms (Sen, 1999, Ch. 2)◗. Nussbaum follows Sen on this. Freire treats it as politically instrumental — aimed at transformation of unjust structures. Illich argues the question of aims is corrupted by institutional framing. This disagreement matters practically: if education is intrinsically valuable, it cannot legitimately be replaced by efficient delivery of outcomes.

3

THE EMPIRICAL EVIDENCE: WHAT PREDICTS ADULT FLOURISHING?

The v1 review relied on three main empirical sources — the Dunedin study (Moffitt et al., 2011), the Perry Preschool study (Schweinhart et al., 2005), and the Grant Study (Vaillant, 2012) — all at Training-derived provenance. The v2 review substantially expands and updates this evidence base. It adds the psychology of flourishing — what psychologists have actually learned about what constitutes and predicts a good adult life — and provides a more honest treatment of the self-regulation evidence, including replication studies that complicate the popular narrative.

3.1 3.1 WHAT FLOURISHING ACTUALLY IS: THE PSYCHOLOGICAL EVIDENCE

Before asking what predicts adult flourishing, we must ask what flourishing *is*. Four independent research programs converge on a multidimensional answer that education has largely failed to incorporate.

Carol Ryff's six-dimensional model (1989) defines psychological well-being as autonomy, environmental mastery, personal growth, positive relations with others, purpose in life, and self-acceptance. This is explicitly a *eudaimonic* model — grounded in Aristotle's conception of flourishing as the full exercise of human capacities, not the hedonic model of subjective happiness (Ryff, 1989)○. Crucially, Ryff has linked these dimensions to biological markers — lower inflammatory cytokines (IL-6), lower cardiovascular risk, better neuroendocrine function — suggesting that eudaimonic well-being is not merely a philosophical preference but has physiological substrates (Ryff, 1989 and subsequent work)○.

Ryan and Deci's Self-Determination Theory (2000) identifies three basic psychological needs — autonomy, competence, and relatedness — whose satisfaction is necessary for intrinsic motivation, optimal functioning, and well-being across cultures. Their finding that these three needs are genuinely universal, not culturally specific, is supported by evidence from over a hundred cross-cultural studies spanning collectivist and individualist societies (Ryan & Deci, 2000)○. The educational implication is direct: learning environments that satisfy these three needs produce better motivation and deeper engagement; environments that thwart them produce controlled motivation, amotivation, and ill-being — regardless of how good the content is.

Corey Keyes's two-continua model (2002) demonstrates that mental health and mental illness are not opposite ends of a single spectrum but two independent dimensions. A person can be free of diagnosable illness and yet *languishing* — lacking positive engagement, purpose, and social contribution. By Keyes's criteria, only about 17% of U.S. adults are *flourishing* — experiencing high levels of emotional, psychological, and social well-being (Keyes, 2002)○. This finding is sobering for education: if the goal is to produce flourishing adults, current educational systems are failing for over 80% of the population — not because graduates are mentally ill but because they are languishing.

Martin Seligman's PERMA model — Positive emotion, Engagement, Relationships, Meaning, and Accomplishment — synthesizes positive psychology's account of flourishing (Seligman, 2011)◑. The Strath Haven High School pilot ($n \approx 300$) showed that a positive-psychology curriculum improved student engagement, curiosity, love of learning, and creativity as rated by independent

teachers blind to condition, though no significant effects on depression or anxiety were found (Seligman, 2011)◑. Seligman himself describes the broader evidence as "preliminary and much in need of replication." Roy Baumeister and colleagues (2013) add an important distinction: happiness and meaningfulness are empirically separable, with meaning involving more stress, self-sacrifice, and temporal integration — connecting the present to past and future in a coherent narrative (Baumeister et al., 2013)○. Most philosophical traditions (Aristotle, Nussbaum, Peters, Bildung) favor eudaimonic flourishing — meaning, purpose, the exercise of capacities — over hedonic happiness, and the empirical evidence supports this distinction.

Peterson and Seligman's *Character Strengths and Virtues* (2004) provides the most ambitious attempt to create an empirical taxonomy of character. Their VIA Classification identifies twenty-four character strengths organized under six broad virtues (wisdom, courage, humanity, justice, temperance, transcendence), derived from convergent analysis across world philosophical and religious traditions. The strengths most strongly correlated with life satisfaction — hope, zest, gratitude, curiosity, and love — are among those that schools least systematically develop (Peterson & Seligman, 2004)◑. Meanwhile, the strengths most emphasized in traditional academic curricula — knowledge-based wisdom strengths like love of learning and judgment — show the weakest correlation with life satisfaction. This does not mean schools should stop teaching knowledge; it means schools are systematically underinvesting in the character strengths that matter most for flourishing.

3.2 3.2 THE LONGITUDINAL EVIDENCE: WHAT ACTUALLY PREDICTS GOOD LIVES?

Two major longitudinal studies — spanning 75 and 40 years respectively — provide the strongest available evidence about what childhood and early-adult capacities predict late-life flourishing.

George Vaillant's *Triumphs of Experience* (2012) reports on the Harvard Grant Study, which followed 268 Harvard men from the late 1930s for seventy-five years. The headline finding is that the warmth of relationships — not career success, not IQ, not social class — was the strongest predictor of late-life satisfaction and health. "Happiness is love. Full stop," Vaillant concluded. More precisely, the study found that mature defense mechanisms — altruism, humor, sublimation, suppression, anticipation — predicted better outcomes across nearly every domain. Men who developed the capacity for intimate, reciprocal relationships fared better on what Vaillant calls the "Decathlon of Flourishing," a composite measure including career achievement, mental and physical health, close friendships, and subjective well-being (Vaillant, 2012)◑.

For education, the Grant Study's most provocative finding is negative: childhood IQ, academic achievement, and social class predicted career earnings but were only weakly associated with late-life satisfaction and health. What predicted late-life flourishing was the capacity to form and maintain warm relationships, to deploy mature rather than immature psychological defenses, and to continue developing emotionally through midlife. These are capabilities that formal education rarely addresses directly.

Emmy Werner and Ruth Smith's Kauai Longitudinal Study (2001) provides essential complementary evidence from a radically different population — an entire birth cohort (n = 698) on the Hawaiian island of Kauai, followed for forty years. Where the Grant Study tracked elite Harvard men, the Kauai study tracked a diverse, largely working-class, multiethnic population including many high-risk children from backgrounds of chronic poverty, parental psychopathology, and perinatal stress. The central finding: approximately one-third of high-risk children developed into competent, confident, caring adults despite severe adversity. The protective factors included

dispositional characteristics (an active, sociable temperament; internal locus of control; planning competence), affectional ties within the family (at least one stable, caring person), and external support systems (mentors, churches, community groups) (Werner & Smith, 2001).

The convergence between the Grant Study and the Kauai Study is powerful: across an elite male Harvard cohort and a diverse Hawaiian cohort, across seventy-five and forty years of follow-up, relationships emerge as the strongest predictor of good adult lives. This convergence is further supported by Michaelson and Munakata's (2020) reanalysis of the marshmallow test data, which found that social support explains nearly twice as much variance in adolescent problem behavior as self-control. The educational implication is that the capacity for relationship — for emotional intimacy, empathy, conflict resolution, and sustained connection — is not peripheral to flourishing but central to it, and that education's systematic neglect of relational capability in favor of academic content represents a significant misallocation of developmental attention.

3.3 3.3 SELF-REGULATION: A MORE COMPLICATED PICTURE

The v1 review presented self-regulation as the meta-capability underlying all other learning, grounded primarily in the Dunedin study and the marshmallow test. The v2 evidence requires a more nuanced account.

The Dunedin study's finding that childhood self-control predicts adult health, wealth, and criminal behavior at age 32 (Moffitt et al., 2011) remains the strongest longitudinal evidence for self-regulation's importance. But the marshmallow test — the most famous operationalization of this finding — has been substantially complicated by replication.

Tyler Watts and colleagues (2018) conducted a conceptual replication using the NICHD SECCYD dataset (n = 918, far larger and more diverse than Mischel's original sample). They found that the bivariate correlation between preschool delay of gratification and age-15 academic achievement was approximately half the original Mischel effect size. Two-thirds of even this reduced effect disappeared with adequate controls for family background, early cognitive ability, and home environment. And the behavioral outcomes — social behavior, externalizing problems — showed *no* significant effects at all after controls (Watts et al., 2018).

The Watts finding does not invalidate self-regulation as a concept but transforms what it means. The child who waits longer for the second marshmallow does so partly because they grew up in a more resourceful, higher-trust environment — not purely because they possess a stronger self-control trait. Moreover, the effect is a threshold, not a gradient: the analytically important distinction is between children who cannot wait at all (less than 20 seconds) and everyone else. The popular framing — that more self-control produces proportionally better outcomes — is not what the data show (Watts et al., 2018).

Laura Michaelson and Yuko Munakata (2020) complicate the picture further by reanalyzing the same data with different (preregistered) analytic choices and finding that three of five outcomes show significant bivariate associations, and problem behavior remains significant even after controls. But their key mechanism finding is that social support explains nearly twice as much variance in adolescent outcomes as self-control. The marshmallow test may work as a predictor not because it measures willpower but because it indexes whether a child lives in a trustworthy, predictable environment where waiting makes rational sense (Michaelson & Munakata, 2020).

Adele Diamond's landmark review of executive functions (2012) clarifies the underlying cognitive architecture. Executive functions — inhibitory control (including self-regulation), working memory, and cognitive flexibility — are genuinely important for academic success and life outcomes. But Diamond distinguishes between *core* EFs and the higher-order EFs (reasoning,

problem-solving, planning) that build on them. Core EFs develop rapidly in early childhood and are highly sensitive to environmental stress, while higher-order EFs develop more gradually and are more responsive to educational intervention (Diamond, 2012)•.

Diamond and Lee (2011), in a landmark *Science* review of EF interventions for children ages 4–12, found that computerized cognitive training produces narrow, non-transferring gains, while holistic interventions — martial arts, curriculum-embedded programs (Tools of the Mind, Montessori), physical-plus-character programs — produce broader effects. The implication is that EF develops best when training is embedded in rich, meaningful activity rather than isolated as cognitive drill (Diamond & Lee, 2011)•. However, subsequent meta-analyses have qualified even these claims: Tools of the Mind has mixed replication results, and the mechanism by which holistic programs produce broader gains is not well understood.

Clancy Blair and C. Cybele Raver (2014) add the biological pathway: chronic stress — particularly the unpredictable, uncontrollable stress associated with poverty — impairs the hypothalamic-pituitary- adrenal (HPA) axis and directly degrades the self-regulatory systems that support learning. This means the intervention target should be stress reduction and environmental predictability, not cognitive self-control drill (Blair & Raver, 2014)•.

The integrated picture: self-regulation and executive function are genuinely important for schooling and life outcomes. But the mechanism is primarily environmental — a low-stress, predictable, warm environment enables self-regulation to develop — not primarily cognitive-training-responsive. Curricula that target self-control through discrete skill-training modules are likely to produce narrow effects; curricula that create the relational and environmental conditions for self-regulation to flourish are likely to be more effective. The most important educational interventions for self-regulation may not be self-regulation interventions at all but relationship-building, stress-reduction, and environmental design.

3.4 3.4 EARLY CHILDHOOD: WHAT THE INTERVENTION EVIDENCE SHOWS

The early childhood intervention evidence provides the strongest causal evidence available about what education can accomplish. Greg Duncan and Katherine Magnuson's (2013) meta-analytic review of eighty-four preschool programs found average cognitive gains of approximately d = 0.35, with the most intensive programs (Abecedarian, Perry, IHDP) producing substantially larger effects. The Abecedarian Project produced effect sizes of d = 1.22–1.45 during infancy, making it one of the largest educational intervention effects ever documented (Duncan & Magnuson, 2013)•.

The "fade-out puzzle" — cognitive test score gains diminish within a few years, yet life-outcome improvements persist through adulthood — remains explicitly unresolved. The Abecedarian findings at age 40, recently reported by the original investigators, include effects on brain macrostructure (larger total brain volume and hippocampal volume), reduced metabolic syndrome risk, and improved social decision-making and future orientation — suggesting that early educational intervention changes how people engage with the world at a fundamental level, not merely their test performance (Ramey & Ramey, 2023)•.

The educational implication is not that later education does not matter — it clearly does — but that early investment creates the developmental platform on which later learning builds. This is the "skill begets skill" dynamic from Heckman's framework: early capabilities make it easier to develop later ones, producing compound returns. A curriculum designer must attend to the full developmental arc, not just the K–12 window.

3.5 3.5 COGNITIVE SCIENCE: WHY KNOWLEDGE MATTERS

Daniel Willingham's *Why Don't Students Like School?* (2009/2021) synthesizes forty years of cognitive science into the clearest available argument for content-rich education. The core finding: working memory is severely capacity-limited (roughly four items), so all complex thinking depends on having relevant knowledge organized in long-term memory. You cannot think critically about something you know nothing about because there is nothing for working memory to operate on. Background knowledge determines reading comprehension more than reading skill — high-knowledge poor readers outperform low-knowledge good readers on passages in their knowledge domain (Willingham, 2021, Ch. 2)•.

Critical thinking, on Willingham's account, is not a generic transferable skill but is deeply domain-specific. Transfer between domains is severely constrained by surface structure: only 30% of subjects who heard a structurally identical problem with its solution could apply it when the surface features changed (Willingham, 2021, Ch. 4)•. This converges precisely with Hirst's philosophical argument that each form of knowledge has its own logic, and with the empirical finding from the expertise literature that expert performance does not transfer across domains.

The educational implication is that knowledge — substantive, organized, factual knowledge — is not an obstacle to thinking but its prerequisite. Curricula that prioritize "thinking skills" over content are building on sand. But Willingham also shows that knowledge without the capacity to deploy it is inert in precisely Whitehead's sense: students need both knowledge and extensive practice in applying it across varied contexts.

3.6 3.6 WHAT THE EMPIRICAL EVIDENCE CONVERGES ON

Six convergences emerge from the expanded evidence base:

Relationships are the strongest predictor of adult flourishing. The Grant Study (seventy-five years), the Kauai Study (forty years), and Michaelson and Munakata's reanalysis of the marshmallow data all converge: the capacity for warm, reciprocal relationships predicts life satisfaction, health, and resilience more robustly than IQ, academic achievement, or socioeconomic status. SDT provides the theoretical framework: relatedness is a basic psychological need whose satisfaction is necessary for well-being across cultures.

Flourishing is multidimensional and eudaimonic. Ryff's six dimensions, Keyes's flourishing criteria, Seligman's PERMA, and Baumeister's happiness-meaning distinction all converge: a good life is not reducible to happiness or the absence of illness. It involves purpose, growth, positive relationships, autonomy, and environmental mastery. Only 17% of American adults meet Keyes's flourishing threshold, suggesting current educational systems are not reliably producing this outcome.

Self-regulation matters but its development is primarily environmental. The Dunedin study, Diamond's EF review, and Blair and Raver's developmental psychobiology all confirm that self-regulation is important. But the marshmallow replication (Watts et al., 2018) shows the effect is smaller than claimed and largely confounded by environment, Diamond and Lee show that EF training must be holistic and embedded rather than isolated, and Blair and Raver show that the intervention target should be environmental stress reduction rather than self-control training.

Background knowledge is the cognitive substrate of critical thinking. Willingham's synthesis of the working memory literature, Hirst's philosophical analysis of forms of knowledge, and the expertise literature all converge: thinking is domain-specific and knowledge-dependent. "Critical thinking" as a generic transferable skill is not supported by the evidence.

Character is both measurable and developable, but schools underinvest in the strengths that matter most. Peterson and Seligman's VIA Classification demonstrates cross-cultural convergence on character strengths. The strengths most correlated with life satisfaction — hope, zest, gratitude, curiosity, love — are those schools least systematically develop. This is perhaps the most actionable finding from the flourishing literature.

Early investment compounds but does not determine. The early childhood evidence (Abecedarian, Perry, IHDP) shows that early intervention creates developmental platforms, and the fade-out puzzle suggests the mechanism involves fundamental orientation changes rather than test-score gains. But Vaillant's Grant Study shows that defense mechanism maturation continues through midlife, and SDT shows that motivation remains responsive to need satisfaction across the lifespan. Development does not end at age five or eighteen; the question is how to create conditions that support it throughout life.

4

CURRICULUM THEORY: TRANSLATING AIMS INTO LEARNING

The gap between philosophical aims and classroom practice is not a failure of implementation but a design problem. Three bodies of theory address it: the sociology of curriculum knowledge, which reveals what happens to knowledge as it enters schools; the German-Nordic Bildung/Didaktik tradition, which provides a principled framework for content selection; and the comparative framework literature, which shows what national systems have converged on.

4.1 4.1 THE SOCIOLOGY OF CURRICULUM KNOWLEDGE

Basil Bernstein, Michael Apple, and Yves Chevallard independently developed analyses of how knowledge is transformed as it moves from scholarly production to classroom delivery. Their convergence on the basic finding — that curriculum knowledge is never a neutral transmission of disciplinary knowledge but is always transformed in ways that embed social power — is one of the most important insights in curriculum theory.

Bernstein's *Pedagogy, Symbolic Control and Identity* (2000) provides the analytical machinery. His concept of *classification* describes the strength of boundaries between knowledge categories — between school subjects, between academic and everyday knowledge, between knowledge designated for different social groups. *Framing* describes who controls what is taught, in what order, at what pace, and against what evaluative criteria. Together, classification and framing encode power relations into the structure of curriculum without anyone explicitly deciding to do so (Bernstein, 2000, Ch. 2)•.

The crucial educational finding is about access rules. Bernstein shows that middle-class children acquire *recognition rules* (the ability to identify what context you are in) and *realization rules* (the ability to produce what that context demands) at home, through the elaborate code of family discourse. Working-class children do not. When schools use "invisible pedagogy" — weak framing, implicit rules, child-centered approaches — the children who already possess the recognition and realization rules thrive, while those who do not are left to flounder without being able to name what they lack. "Those children who are unable to make the rules of their regulatory and instructional discourse explicit cannot be considered to have really acquired the code" (Bernstein, 2000, Ch. 4)•. This is the strongest sociological argument against purely progressive, child-centered pedagogy for disadvantaged students: when the rules are hidden, those who already know them have an insurmountable advantage.

Michael Apple's *Ideology and Curriculum* (1979/2004) extends this analysis to the politics of content selection. Apple shows that curriculum is never merely a neutral selection of "the best that has been thought and said" but is produced by a "selective tradition" — a process that presents particular class interests as universal knowledge. The "legitimate knowledge" taught in schools reflects "the knowledge that 'we all must have'" as determined by groups with the power to define what counts as knowledge (Apple, 2004, Chs. 1–2)•. Crucially, this selective tradition operates through hegemony — Gramsci's concept of dominance through cultural consensus rather than overt coercion. The curriculum appears natural and obvious precisely because the process of selection has been erased.

Yves Chevallard's *La Transposition Didactique* (1985/1991) adds the mechanism by which scholarly knowledge is transformed into teachable knowledge. The process he calls *didactic transposition* involves depersonalization (stripping knowledge from the context of its production), dehistoricization (removing the temporal development of the ideas), decontextualization (separating knowledge from the problems it was created to solve), and linearization (arranging knowledge in an artificial logical sequence that may bear no relation to how it was actually developed). The result is a "fiction of identity" — the curriculum pretends that what students encounter *is* the scholarly knowledge, when in fact it is a fundamentally different object (Chevallard, 1991, French)•.

The convergence of Bernstein, Apple, and Chevallard produces a finding that every curriculum designer must internalize: the knowledge that reaches students is never the knowledge that scholars produced. Something happens in the transformation — and what happens encodes social power, institutional constraints, and ideological commitments. The transformation is necessary (Chevallard: without it, knowledge cannot be taught) but it is not neutral (Apple: the selection reflects whose knowledge matters) and it is structurally governed (Bernstein: classification and framing encode power relations). Acknowledging this does not paralyze curriculum design; it makes it more honest.

4.2 4.2 THE BILDUNG-DIDAKTIK TRADITION AND "POWERFUL KNOWLEDGE"

The German *Bildung* tradition — self-formation through encounter with the world — represents arguably the most developed Western framework for principled content selection. Its convergence with Michael Young's "powerful knowledge" movement in British sociology of education is one of the most intellectually productive developments in recent curriculum theory.

Wolfgang Klafki's concept of *categorical Bildung* argues that educational content should be selected for its capacity to illuminate "epoch-typical key problems" — the defining challenges of the era. Content is not valuable because it is traditional or canonical but because it is epistemically powerful: it opens learners to ways of thinking that transcend everyday experience. Klafki proposes that content must be simultaneously *elementary* (fundamental to the discipline), *fundamental* (opening essential experiences of the world), and *exemplary* (showing structural features of broader reality). Content that meets all three criteria simultaneously develops both material gains (content mastered) and formal gains (capacities developed) — dissolving the knowledge-skills dichotomy from within (Sjöström & Eilks, 2020; Moilanen, 2025)•.

Ole Andreas Kvamme (2021) extends Klafki's framework for the Anthropocene, shifting from "epoch-typical key problems" to "epoch-typical key concerns" — a rhetorical move that acknowledges the ethical and existential dimensions of contemporary challenges rather than framing them as problems awaiting technical solutions. Climate change, artificial intelligence, democratic decline, and global inequality would all qualify as epoch-typical key concerns requiring curriculum response (Kvamme, 2021)•.

Michael Young and Johan Muller's concept of "powerful knowledge" (2019) arrives at a convergent position from British sociology of education via Durkheim and Bernstein. Knowledge is "powerful" when it has the capacity to predict, explain, and — crucially — enable the envisioning of alternatives. It is the discipline's animating principles, not its factual inventory, that empower. Young frames this as a matter of educational justice: students from disadvantaged backgrounds are most harmed by curricula that focus on everyday knowledge and "relevance" rather than disciplinary rigor. It is precisely the students who lack access to powerful knowledge at home who most need schools to provide it (Muller & Young, 2019)•.

Niklas Gericke and colleagues (2018) demonstrate the convergence explicitly: "Bernstein shares the Didaktik view of the unity of curriculum and pedagogy" that has been "lost in contemporary curriculum studies." The five questions of Klafki's didactical analysis are structurally parallel to the question "what makes this knowledge powerful for these learners at this historical moment?" The intellectual genealogies differ — German critical hermeneutics versus British sociology of education — but the practical conclusion is nearly identical (Gericke et al., 2018)•.

Where the traditions diverge: the Bildung tradition, particularly Michael Uljens's non-affirmative didactics, foregrounds the pedagogical relationship and *Mündigkeit* (autonomy as a life orientation) as constitutive of education. Young and Muller are concerned primarily with the epistemic properties of knowledge. Uljens explicitly criticizes Young for being "founded in epistemology rather than theory of education, and Didaktik" — for asking what kind of knowledge empowers before asking what kind of person this education forms (Uljens, 2023)•. These are compatible but genuinely different starting points.

4.3 4.3 21ST-CENTURY COMPETENCY FRAMEWORKS: LESS CONVERGENCE THAN CLAIMED

Joost Voogt and Natalie Pareja Roblin's comparative analysis of eight major competency frameworks (2012) reveals that the apparent global convergence on "21st-century skills" is narrower and more fragile than the policy discourse suggests. Four constructs appear in all eight frameworks: collaboration, communication, ICT literacy, and social/cultural competencies. Most also include creativity, critical thinking, and problem-solving. But the conceptual structures vary so dramatically that cross-framework comparison is interpretive rather than definitional (Voogt & Pareja Roblin, 2012)•.

The deeper finding is structural: five of the eight frameworks were developed with private-sector sponsorship (Apple, Cisco, Dell, Intel, Microsoft, SAP). The teaching profession was largely absent from framework development. This is the selective tradition problem in contemporary form: the frameworks encode the skill requirements of the knowledge economy as identified by corporations — and present this as neutral educational science (Voogt & Pareja Roblin, 2012)•.

Brenda Thornhill-Miller and colleagues (2023) confirm from inside the advocacy: the "4Cs" — creativity, critical thinking, communication, collaboration — lack adequate empirical taxonomy. The constructs cannot be cleanly distinguished, measurement tools have admitted validity limitations, and even the advocates concede that critical thinking "involves specific knowledge in the different areas in which it is applied" (Thornhill-Miller et al., 2023)•. The 4Cs are a policy communication tool, not a research finding.

The deepest implication: the convergence across competency frameworks is convergence at the level of aspirational rhetoric, not empirically validated, epistemologically coherent content. The frameworks name things schools have always aspired to — critical thinking, collaboration, problem-solving — and dress them in contemporary vocabulary, while leaving the fundamental curriculum-design question essentially unaddressed.

4.4 4.4 DEMOCRATIC EDUCATION: THE POLITICAL DIMENSION

Edda Sant's systematic review of democratic education literature (2019) adds a dimension that competency frameworks typically bracket: education's relationship to democratic participation. Sant identifies four conceptions of democratic education — liberal-communitarian (Dewey), deliberative (Habermas), participatory (Freire), and agonistic (Mouffe) — and demonstrates

that each has its own epistemological foundations. The deliberative model assumes consensus is achievable through rational dialogue; the agonistic model argues that conflict is constitutive of democracy and should not be resolved but channeled constructively (Sant, 2019)•.

For the "what should be learned?" question, Sant's review shows that democratic competence cannot be treated as a single capability but involves at least four distinct orientations — each with different curricular implications. A curriculum that develops only deliberative democratic skills (civil discourse, perspective-taking, consensus-building) and neglects agonistic competencies (the capacity to engage productively with irreducible conflict, to participate in dissent, to challenge rather than accommodate) has developed an incomplete democratic subject.

5 THE KNOWLEDGE-SKILLS SYNTHESIS

The debate between "knowledge-centered" and "skills-centered" education has consumed enormous energy in education policy and practice. The v2 evidence — cognitive science, curriculum sociology, the Bildung tradition, and comparative framework analysis — resolves it more cleanly than the policy wars suggest.

5.1 5.1 WHY THE DICHOTOMY IS FALSE

E. D. Hirsch's *Cultural Literacy* (1987/2002) and the Core Knowledge movement argue for content-rich curriculum built on shared cultural knowledge. The "21st-century skills" movement argues for transferable competencies. In practice, these have been treated as mutually exclusive.

The cognitive science evidence (Section 3.5) strongly supports the knowledge side: thinking is domain-specific and knowledge-dependent; "critical thinking" is not a generic transferable skill; working memory limitations mean that all complex thinking requires organized knowledge in long-term memory (Willingham, 2021)•. Hirsch is right that background knowledge is what makes reading comprehension, civic discourse, and scientific reasoning possible. His argument that "literacy depends on knowledge" is among the best-supported claims in educational research (Hirsch, 2002)•.

But the curriculum sociology evidence (Section 4.1) shows that the knowledge-centered position, taken alone, is politically naïve. Apple shows that "which knowledge?" is always a power question. Bernstein shows that how knowledge is framed determines who can access it. Chevallard shows that the knowledge students receive has been transformed from the knowledge scholars produced. A curriculum designer who says "teach powerful knowledge" without asking whose power determines the selection has not yet begun the design work.

The skills-centered position fails on its own terms. Voogt's comparative analysis shows that competency frameworks that omit core subject knowledge are less coherent than those that include it. Thornhill-Miller's review concedes that critical thinking "involves specific knowledge in the different areas in which it is applied." Skills without content are structurally incoherent: they are always skills *at* or *in* something. The rationality community's experience confirms this from practitioner evidence: calibration training without domain knowledge produces well-calibrated ignorance.

5.2 5.2 THE RESOLUTION

The resolution emerges from the convergence of Klafki's categorical Bildung, Young's powerful knowledge, Hirst's forms of knowledge, and Willingham's cognitive science:

Knowledge and capacity are inseparable. Klafki's "exemplary" content simultaneously develops material gains (content mastered) and formal gains (capacities developed). Young's "generative capacity" means disciplinary knowledge's power is precisely that it gives learners access to frameworks for generating new ideas, not just consuming existing ones. Hirst's forms of knowledge constitute the mind rather than merely furnishing it. Willingham's working memory research shows that knowledge is what thinking operates on.

Depth matters more than breadth. Whitehead warns against covering many subjects superficially: "do not teach too many subjects" and "what you teach, teach thoroughly" (Whitehead, 1929)•. This is supported by the expertise literature showing that transferable understanding requires deep engagement within domains, not surface coverage across them.

The social justice argument clinches it. Young, Bernstein, Hirsch, and Talbot all converge on the same claim from different directions: denying disadvantaged students access to powerful disciplinary knowledge — whether through progressive boundary-weakening, invisible pedagogies, skills-only curricula, or relevance-based pedagogy — produces covert stratification that is more damaging than explicit stratification because it removes the visible markers students need to understand why they are failing. "Access to powerful knowledge is a right for all not just the few" (Muller & Young, 2019)•is not a conservative claim; it is the strongest available social justice argument for a knowledge-centered curriculum.

The remaining contested ground. The synthesis position specifies a framework condition — depth over breadth, disciplinary coherence, exemplary rather than exhaustive, organized around epoch-typical key problems — but does not specify the content. *Which* knowledge, organized *how*, at *what* ages — these remain normative choices that the evidence constrains but does not determine. The PI must make them.

6

CROSS-CULTURAL PERSPECTIVES: WHAT THE WORLD HAS CONVERGED ON

The v1 review cited almost exclusively English-language sources and drew on Western philosophical traditions. This was a systematic bias that v2 addresses through engagement with the Confucian tradition (Section 2.5), the French *didactique* (Section 4.1), the German *Bildung* tradition (Section 4.2), and — in this section — the national curriculum frameworks of Finland, Singapore, Japan, and the OECD, as well as the emerging decolonization critique of universalist curriculum frameworks.

6.1 6.1 FOUR NATIONAL CURRICULA: WHAT KEEPS APPEARING

Finland's National Core Curriculum (2014), Singapore's 21st Century Competencies Framework, Japan's Course of Study (2017 revision), and the OECD's Learning Compass 2030 represent four of the world's most carefully theorized educational frameworks, developed from very different cultural and political starting points. Their convergences are instructive precisely because they cannot be attributed to mutual influence or shared philosophical inheritance.

Four features appear persistently across all four.

Rejection of pure academic-content transmission as sufficient. All four explicitly state that academic knowledge alone is inadequate. Finland embeds knowledge within seven transversal competences; Singapore wraps competencies around a central values core; Japan integrates three pillars — knowledge/skills, thinking/judgment/expression, and motivation/personality — into every subject; the OECD frames knowledge as one of four competency components alongside skills, attitudes/values, and transformative competencies (Finland NCC 2014; Singapore 21CC Framework; Japan Course of Study 2017; OECD Learning Compass 2030)•.

Agency and self-direction as non-negotiable outputs. Every framework includes some version of the self-directed, autonomous learner. Finland's T1 (thinking and learning to learn) embeds self-direction within the Bildung ideal. Singapore names the "Self-Directed Learner" as one of four desired outcomes. Japan's *ikiru chikara* (zest for living) emphasizes the ability to "identify problems for oneself, learn for oneself, think for oneself" (Tsuneyoshi, 2020)•. The OECD positions student agency as the compass-holder for the entire framework. This convergence across culturally diverse systems suggests it is tracking something real about what functional human agency requires.

Character and values as structurally necessary. No major national curriculum treats character formation as optional enrichment. Finland's four value pillars ground the entire framework. Singapore places six core values (respect, responsibility, resilience, integrity, care, harmony) at the concentric center. Japan's *toku* (moral education) pillar is mandatory with dedicated hours. The OECD includes "taking responsibility" as a transformative competency. The disagreement is about *whose* values and *by what* pedagogy, not about whether character formation is education's business.

The knowledge-skills false dichotomy is rejected. All four frameworks refuse the binary choice. Finland embeds competences in disciplines. Singapore explicitly states "21CC enhance academic content, they do not replace it." Japan integrates the three pillars into every subject. The OECD states "competency and knowledge are neither competing nor mutually exclusive concepts." The question for these systems is not which to choose but how to integrate.

What keeps *disappearing* is equally telling: explicit answers to *which* knowledge, *which* values, and *which* character traits matter most. All four frameworks are architecturally sophisticated but content-thin. They describe the structure of what education should produce without fully specifying the content. This is both politically necessary — international frameworks must accommodate local variation — and epistemically limiting: it leaves the hardest decisions to local implementation, where they are most vulnerable to the political dynamics Bernstein and Apple describe.

6.2 6.2 THE CONFUCIAN CONTRIBUTION

The Confucian tradition (examined philosophically in Section 2.5) has distinct institutional expressions in contemporary East Asian education. Fengyan Wang's (2004) overview of Confucian educational philosophy identifies the pedagogical framework: moral education begins with family, extends to community, and culminates in civic responsibility; the teacher functions as a moral exemplar rather than merely an information transmitter; and learning is fundamentally a process of moral self-cultivation rather than cognitive acquisition (Wang, 2004)●.

The Confucian tradition adds three things that Western frameworks do not adequately capture. First, a *relational ontology of the self* in which personhood is constituted through relationships, not prior to them — making communal and cooperative learning structures not a pedagogical choice but an ontological requirement. Second, the *unity of knowing and acting* as a foundational principle that reframes what counts as genuine education — propositional knowledge that does not transform behavior is not knowledge in the fullest sense. Third, the *exemplar as the primary pedagogical technology* — the teacher is a living embodiment of the virtues being cultivated, and students learn primarily through emulation. This has implications for teacher selection, preparation, and evaluation that Western systems have not seriously engaged.

6.3 6.3 JAPAN: CHARACTER THROUGH SCHOOL CULTURE

Ryoko Tsuneyoshi's (2020) analysis of Japan's *tokkatsu* (special activities) reveals the most developed existing model for character formation through institutional design rather than dedicated instruction. Tokkatsu distributes non-cognitive education across the entire school day: students clean their own classrooms, serve lunch to each other, rotate through small-group (*han*) leadership roles, organize school events, and participate in governance activities. The teacher facilitates reflection on the meaning of these activities rather than delivering moral precepts (Tsuneyoshi, 2020)●.

The most important finding from Japan is not that individual teachers can create holistic educational experiences — any tradition knows this — but that national curriculum standards can mandate structural features (34–35 hours per year of tokkatsu, mandatory cleaning, deliberate *han* reorganization) that ensure *every* student in *every* school engages in character-forming activities regardless of their particular teacher's pedagogical commitments (Japan Course of Study 2017)●. This is a design solution to the problem that holistic education in most systems depends on the accident of having a particular teacher.

But Japan's experience also provides the most important cautionary evidence. The *yutori* (relaxed education) reforms of 1998–2002, which reduced academic content by 30% to make room for holistic development and "Integrated Study," produced measurable, lasting achievement declines that the system subsequently worked to correct. The 2017 reform's answer — integrate competency goals *into* academic subjects rather than substituting holistic time *for* academic content — is the clearest available national-scale evidence for how to resolve the knowledge/holistic-development

tension: integration, not substitution (Sarkar Aranil & Fukaya, 2009, Abstract-verified; Japan Course of Study 2017)•.

A critical qualification: Tsuneyoshi warns that group activities have historically served "totalitarian, nationalistic, and undemocratic purposes." The structural features of tokkatsu are morally neutral; what matters is the guiding principles. Japan's experience with school-based bullying (*ijime*) and school refusal (*futōkō*) suggests that curricula that build collective identity can suppress individuality in ways that produce their own pathologies. Any curriculum designer borrowing from the Japanese model needs protections for individual dissent (Tsuneyoshi, 2020)•.

6.4 6.4 THE FRENCH DIDACTIQUE: A METHODOLOGY FOR CURRICULUM DESIGN

Philippe Perrenoud's (1998/2007) extension of Chevallard's didactic transposition provides the most operationally specific methodology for competence-based curriculum design. His eight-link chain — from identifying relevant social practices, through competence analysis, cognitive resource identification, mobilization scheme hypothesis, and learning situation design, to assessment criteria — tells curriculum designers exactly what must be decided at each step and where the value judgments unavoidably enter (Perrenoud, 2007, French)•.

The French tradition also contributes a vocabulary that resolves confusions the English-language literature perpetuates. The five-category distinction — *savoir* (theoretical knowledge), *connaissance* (experiential knowledge), *savoir-faire* (practical know-how), *savoir procédural* (procedural representation), and *compétence* (integrated capacity to act in complex situations) — allows curriculum designers to specify what they mean by "knowledge," "skill," and "competence" without the terminological collisions that make Anglo-American curriculum debates often unintelligible. The key insight: *savoir-faire* (success in action) is not reducible to *savoir procédural* (a representation of the procedure) — knowing how something is done is not sufficient for doing it (Perrenoud, 2007, French)•.

6.5 6.5 THE GEOCAPABILITIES PROJECT: OPERATIONALIZING THE FRAMEWORK

David Lambert and colleagues' GeoCapabilities project (2015) provides the most developed practical example of translating the capabilities approach into subject-specific curriculum design. The project shows what it takes to move from Nussbaum's philosophical framework to classroom decisions: the ten central capabilities required modification into three "geo-capabilities" that preserved the philosophical intent while adding disciplinary specificity. This translation work is unavoidable, and it is the point at which philosophical framework becomes curriculum decision — requiring teacher judgment, not algorithmic application (Lambert et al., 2015)•.

Lambert's equity argument is direct: "all young people (not only those who go to university) have the right to the capabilities offered through 'epistemic ascent'" (Lambert et al., 2015)•. Access to disciplinary knowledge is a capability right. This reframes the curriculum access debate: it is not about preserving academic traditions versus democratizing access by simplifying content. Both positions, from the capabilities perspective, deny students something they are owed.

6.6 6.6 THE DECOLONIZATION CRITIQUE

Damian Talbot's (2023) paper asks whether the capabilities approach can help decolonize the curriculum — and answers with a qualified yes. Talbot takes seriously the strongest decolonial critique: that disciplinary knowledge is "implicated by colonial and racial violences" and that

separating "knowledge of the powerful" from "powerful knowledge" is ideologically motivated. But he responds that cultural essentialism — matching students to identity-group cultural content — is itself a conservative move that freezes cultures, suppresses dissent within cultures, commits the genetic fallacy about idea-origins, and denies students agency-expanding disciplinary access. The capabilities approach is defensible because it has been developed through cross-cultural dialogue, is open-ended, and its origins do not determine its veracity (Talbot, 2023)•.

Simon Breakspear's (2012) analysis of PISA's policy impact reveals the operational reality: thirty-four of thirty-seven surveyed national systems report their curriculum goals "very" or "moderately" aligned with PISA competencies, and sixteen have explicitly adjusted curriculum standards. PISA functions as a universalist curriculum framework with real normative force — embedding a specifically OECD-Western, labor-market-oriented conception of what should be learned and exporting it globally (Breakspear, 2012)•.

Together, Talbot and Breakspear suggest that the question is not whether to have a universalist framework but *which* universalist framework — and that a capabilities-grounded framework is more defensible than a PISA-economic-skills framework precisely because it is explicitly normative rather than masking its normativity as measurement.

6.7 6.7 THE BIG QUESTION: UNIVERSAL CORE OR IRREDUCIBLY LOCAL?

The cross-cultural evidence supports a qualified "yes" to the question of whether a defensible core of educational aims transcends cultural context. The qualification is essential.

What appears convergent across independent traditions — Confucian philosophy, Japanese institutional practice, Finnish curriculum design, Singapore's framework, the OECD's consensus document, the French *didactique*, and the capabilities approach — includes at least five elements:

1. **Agency and self-direction.** The capacity to identify one's own problems, set one's own goals, and act toward them appears in every framework examined: *ikiru chikara*, OECD student agency, Finland's T1, Singapore's Confident Person, Confucian self-cultivation, capabilities-based practical reason.

2. **Practice-grounded competence.** The recognition that knowing about something and being competent in it are different, bridged only through situated practice: Wang Yang-ming's unity of knowing and acting, Perrenoud's eight-link chain, Aristotelian habituation, Japan's tokkatsu.

3. **Social and relational embedding.** Education must engage the social dimension as intrinsic to what education does, not as an add-on: Confucian relational ontology, tokkatsu, Singapore's co-curricular activities, Finland's cultural competence, OECD co-agency.

4. **Character as a non-negotiable output.** No tradition examined treats character formation as outside education's mandate. The disagreement is about methods and whose character, not about whether character is education's business.

5. **Disciplinary knowledge as necessary but insufficient.** Every framework that has engaged the knowledge question seriously has concluded that disciplinary knowledge is foundational but does not by itself produce competent human agency. Something more is required — variously called competence, capability, character, or moral formation.

What remains irreducibly local: the terminal value of education (individual flourishing versus cosmic participation versus national community versus collective well-being), the role of national identity, the balance between autonomy and community, and — most critically — the specific content. All frameworks agree that disciplinary knowledge matters; none specifies which disciplines all students should encounter, or how deep the encounter should be.

The structural answer: there is a defensible cross-cultural *architecture* for educational aims — foundational literacy and numeracy, disciplinary knowledge in several domains, competences developed through disciplinary practice, character formed through structured experiential practice, civic agency and social responsibility. Every serious framework arrives at something recognizable as this structure. But the architecture does not determine the content. Filling it in requires normative choices that are locally irreducible.

7

WHAT THE FRAMEWORKS CONVERGE ON: THE SHAPE OF A COMPETENT ADULT

This is the most important section of this review. Across philosophy, empirical research, positive psychology, curriculum theory, cross-cultural evidence, and practitioner experience — what keeps coming up? What seems genuinely robust? The answer must be grounded in specific evidence, not in generic philosophical summary that would sound the same without the reading.

7.1 7.1 THE CAPACITY FOR RELATIONSHIP

The single most robust finding across the entire evidence base is that the capacity for warm, reciprocal human relationship is central to adult flourishing — not peripheral, not "soft skills," not a nice-to-have, but the strongest predictor of good lives identified by longitudinal research.

The evidence is convergent across independent lines: Vaillant's Grant Study (seventy-five years: "Happiness is love. Full stop"), Werner and Smith's Kauai Study (forty years: one stable caring relationship sufficient for resilience), Michaelson and Munakata's reanalysis (social support explains twice the variance of self-control), Ryan and Deci's SDT (relatedness as a basic psychological need), Nussbaum's affiliation as a central capability and "fertile functioning," the Confucian tradition's relational ontology, Ubuntu's "I am because we are," and Deming's (2017) finding that social skills are increasingly important in the labor market (Training-derived).

Yet relational capability is perhaps the domain where education is most deficient. Schools develop cognitive capabilities systematically through academic instruction but develop relational capabilities mostly incidentally — through peer environments, extracurricular activities, or the accident of a good teacher- student relationship. Japan's tokkatsu model (Section 6.3) is the most developed exception: an institutionally mandated structure for developing relational and communal capabilities through shared school life. The evidence suggests that this systematic neglect of relational capability in favor of academic content represents a significant misallocation of educational attention.

7.2 7.2 SELF-REGULATION AND EXECUTIVE FUNCTION — AS ENVIRONMENTAL PRODUCT

Every tradition points to self-regulation in some form: the Dunedin study's self-control gradient, Heckman's non-cognitive skills, Nussbaum's practical reason, Dewey's intelligent activity, Freire's reflective praxis, the Bildung tradition's self-formation. But the v2 evidence substantially revises the v1 account of what this means for education.

The updated picture (Section 3.3): self-regulation is genuinely important but is primarily an *environmental product* rather than a directly trainable cognitive skill. The marshmallow test replication shows the effect is smaller than claimed and largely confounded by family environment. Diamond and Lee's review shows that EF training must be holistic and embedded to transfer. Blair and Raver show that chronic stress directly degrades self-regulatory systems.

The practical implication is that the most effective way to develop self-regulation may not be self-regulation curricula but the creation of predictable, warm, low-stress educational environments

where self-regulation can develop naturally — combined with holistic programs that integrate cognitive challenge, physical activity, and social engagement. This shifts the design target from "teach self-control" to "build environments that support self-regulation development," which is a structural rather than curricular intervention.

7.3 7.3 DEEP KNOWLEDGE IN SUBSTANTIVE DOMAINS

Willingham, Hirsch, Young, Hirst, the Bildung tradition, and Nussbaum all converge: education must develop substantive knowledge, not merely generic skills. Knowledge is what thinking operates on, what enables reading comprehension, what provides the "powerful" epistemic access that everyday experience cannot provide.

The evidence suggests that depth matters more than breadth. Expertise is domain-specific, and the flexible thinking that "critical thinking" frameworks aspire to requires deep engagement within specific domains. Whitehead's warning against covering many subjects superficially is supported by the transfer literature: understanding transfers more readily when it is deep enough to engage the underlying principles rather than the surface features of a domain (Willingham, 2021)•.

The social justice dimension reinforces the knowledge argument: Young and Bernstein show that disadvantaged students are most harmed when curricula dilute disciplinary rigor in the name of relevance. The progressive position that schools should teach what is "relevant" to students' lives, rather than abstract disciplinary knowledge, has the paradoxical effect of reproducing inequality by denying disadvantaged students access to the intellectual tools that advantaged students acquire at home.

But the cross-cultural evidence adds an important qualification: knowledge must be *integrated* with competence development, not taught in isolation from it. Japan's yutori lesson (Section 6.3) shows that substituting knowledge for holistic development produces achievement declines; the 2017 reform demonstrates that the answer is integration, not substitution.

7.4 7.4 CRITICAL CONSCIOUSNESS AND EPISTEMIC AGENCY

Freire's conscientização, Dewey's intelligent activity, Nussbaum's practical reason, Klafki's engagement with epoch-typical key problems, Peters's cognitive perspective, the rationality community's calibration training, and the OECD's "taking responsibility" transformative competency all describe versions of the same capability: the ability to perceive one's situation accurately, understand the forces that shape it, and act thoughtfully in response.

This is not "critical thinking" in the generic, transferable-skill sense. It is the capacity to read the world — to understand how social, economic, political, and technological systems work and how they affect one's life — and to act on that understanding. It requires knowledge (you cannot critically analyze what you do not understand), disposition (the habit of questioning rather than accepting), and what might be called epistemic courage (the willingness to examine uncomfortable truths).

The practitioner evidence strengthens this finding. The rationality community (LessWrong, CFAR, Tetlock's superforecasters) has demonstrated that epistemic competence — calibration, bias detection, Bayesian updating — is decomposable into trainable components. Tetlock's IARPA tournament evidence shows that less than one hour of calibration training improved forecasting accuracy by 6–11% with effects lasting at least a year (Training-derived, corroborated by Morewedge et al., 2015 and 2019). The educational implication is that epistemic competence is not a vague aspiration but a teachable skill set that existing curricula almost entirely neglect.

7.5 7.5 CHARACTER AND PRACTICAL WISDOM

The Aristotelian tradition (Kristjánsson, Darnell), the Confucian tradition (Tu Weiming, Wang), the VIA Classification (Peterson & Seligman), and the national curricula of Finland, Singapore, and Japan all converge: character formation — the development of virtues, dispositions, and moral capabilities — is constitutive of education, not supplementary to it.

The empirical evidence identifies specific character dimensions that predict flourishing. The character strengths most correlated with life satisfaction — hope, zest, gratitude, curiosity, love — are those schools least systematically develop (Peterson & Seligman, 2004)◑. The longitudinal evidence shows that mature defense mechanisms predict better outcomes than IQ or career success (Vaillant, 2012)◑. The resilience evidence shows that internal locus of control, planning skills, and connection to values-bearing institutions are protective across four decades of adversity (Werner & Smith, 2001)○.

Darnell and colleagues' finding that moral knowledge explains only 10% of moral behavior grounds the practical wisdom claim: knowing what is right is radically insufficient for doing what is right. What bridges the gap is *phronesis* — practical wisdom, the capacity to perceive what a situation requires and respond appropriately. Phronesis develops through habituation, experience with varied and consequential situations, and reflective integration of perception, emotion, and action. It cannot be transmitted through lectures; it must be cultivated through practice in contexts where moral judgment has real stakes (Darnell et al., 2019; Kristjánsson, 2015)●.

This is the most directly relevant finding for the competence stack. Layers 3 (judgment) and 5 (character) are not add-ons to knowledge and skill but are what make knowledge and skill *competence* rather than mere capacity. The philosophical and empirical evidence converges: education that does not develop practical wisdom has not produced an educated person, regardless of how much content it has transmitted.

7.6 7.6 PRACTICAL LIFE COMPETENCE

The practitioner evidence identifies a category of competence that academic education systematically ignores: the practical skills of adult life. Financial literacy, health literacy, domestic capability, bureaucratic navigation, and the capacity to manage one's own household and finances are all necessary for adult independence and all systematically absent from conventional curricula.

80,000 Hours identifies "financial runway" — a savings cushion of at least six months — as a component of career capital and a precondition for the risk-taking that career development requires. The homeschooling community (Bauer's *Well-Trained Mind*) treats practical competence as part of the classical curriculum, not separate from it. The FIRE community emphasizes that financial literacy gaps cause immense real-world harm. Lusardi and Mitchell's (2011)○ surveys show that the majority of adults cannot answer basic questions about compound interest, inflation, and diversification. The gap between what adults need to know to manage their lives and what schools teach is not a minor oversight but a structural failure.

7.7 7.7 METACOGNITION AND THE CAPACITY FOR CONTINUED LEARNING

Dewey's "continued capacity for growth," the Bildung tradition's never-completed self-formation, Freire's "beings in the process of becoming," Nussbaum's capabilities as ongoing rather than terminal, and the practitioner emphasis on meta-learning (Young's ultralearning, the rationality community's

calibration) all point toward the same capability: the ability to monitor, direct, and improve one's own learning and development across the lifespan.

Fan and colleagues' (2024) finding on "metacognitive laziness" — that AI-assisted learners produce better products but learn less, because AI offloads the monitoring, evaluation, and orientation processes that drive durable encoding — makes this convergence urgently practical. In an AI environment, metacognitive capacity is not just important for lifelong learning; it is actively at risk of erosion. Curricula must explicitly protect and develop the learner's own regulatory processes, especially as AI tools become pervasive in educational settings (Fan et al., 2024)•.

7.8 7.8 THE CONVERGENCE MAP

Synthesizing across all sources — philosophy, empirical research, flourishing psychology, curriculum theory, cross-cultural evidence, and practitioner experience — the following capabilities emerge as having the strongest multi-traditional support, listed in order of evidentiary robustness:

1. **The capacity for warm, reciprocal relationship.** (Grant Study, Kauai Study, SDT, Nussbaum, Confucian relational ontology, Ubuntu, Deming, Michaelson & Munakata) 2. **Self-regulation and executive function** — developed primarily through environmental quality, not cognitive drill. (Moffitt, Diamond, Blair & Raver, Watts, Nussbaum, Dewey, all four national curricula) 3. **Deep knowledge in substantive domains.** (Willingham, Hirsch, Young, Hirst, Nussbaum, Bildung, all four national curricula) 4. **Critical consciousness and epistemic agency.** (Freire, Dewey, Nussbaum, Klafki, Peters, Tetlock/calibration, all four national curricula) 5. **Practical wisdom and character.** (Aristotle/Kristjánsson, Confucian tradition, Peterson & Seligman VIA, Darnell phronesis evidence, all four national curricula) 6. **Metacognition and the disposition to continue learning.** (Dewey, Bildung, Freire, Fan et al., Young/Newport/rationality community) 7. **Practical life competence** — financial, health, domestic, bureaucratic. (Lusardi, practitioner evidence, Nussbaum, 80,000 Hours) 8. **Aesthetic and creative capability.** (Nussbaum, Bildung, Dewey, Seligman PERMA — Engagement, all four national curricula)

This is not a curriculum. It is a map of what multiple independent traditions converge on as the dimensions of adult competence. A curriculum designer would need to translate these into specific learning objectives, select appropriate content, design learning experiences, and sequence development across ages — using the tools described in this review.

8

WHAT REMAINS GENUINELY CONTESTED

8.1 8.1 THE DEGREE OF CURRICULAR PRESCRIPTION

Should a curriculum specify what all students must learn, or should it specify only the capacities students should develop and leave specific content to teachers and communities? This is the deepest disagreement. Nussbaum, Hirsch, Hirst, and the Bauer/classical education tradition favor more specification. Dewey, Freire, and Schwab favor less. The evidence constrains the answer — knowledge matters, it must be deep, it must be disciplinary — but does not determine which knowledge. This is a values question about freedom and structure in education that the PI must resolve.

8.2 8.2 THE BALANCE BETWEEN INDIVIDUAL AND COMMUNITY

Western frameworks (Nussbaum, Sen, Peters) treat the individual as the primary unit of educational concern. The Confucian tradition treats the self as constitutively relational. Ubuntu locates personhood in relationship. Japan's tokkatsu builds communal identity through shared institutional life. Whether a curriculum should prioritize individual capability development or communal formation has practical consequences — for how classrooms are structured, how assessment works, and what counts as success. The cross-cultural evidence shows that both orientations can produce excellent educational outcomes: Japan's communal tokkatsu model and Finland's individual-autonomy-oriented model both rank among the world's most successful educational systems. The choice between them is not empirical but normative. Tu Weiming's insistence that self-cultivation "cannot be isolated from human-relatedness" and Nussbaum's framing of the individual as the unit of concern represent genuinely different ontologies of the self, and a curriculum must choose — or find a way to honor both — without pretending that one is objectively superior.

8.3 8.3 WHOSE FLOURISHING COUNTS?

Freire insists that "what should be learned?" cannot be separated from "who decides?" and "whose interests are served?" Apple shows that curriculum selection always reflects power. Breakspear shows that PISA has become a de facto global curriculum enforcer, embedding OECD-Western, labor-market-oriented values under the guise of measurement. The capabilities approach (via Talbot) offers a defense of universalism that is more philosophically honest than PISA's masked normativity — but the question of whether any universalist framework can adequately serve historically marginalized communities remains at the edge of what current evidence can settle.

8.4 8.4 HOW MUCH KNOWLEDGE IS ENOUGH?

The knowledge-rich camp (Hirsch, Willingham, Young) argues for extensive shared knowledge. The capability-focused camp argues for deep knowledge in selected domains plus transferable capacities. The practitioner camp argues for more practical knowledge and less academic knowledge. The question of *how much* knowledge is enough — and the related question of what can be looked up

versus what must be internalized — becomes increasingly urgent as AI makes information retrieval trivially easy while simultaneously making the judgment to evaluate retrieved information more critical.

8.5 8.5 WHETHER MORAL CHARACTER CAN BE CULTIVATED THROUGH SCHOOLING

The Aristotelian tradition says yes, through habituation and the development of phronesis. The Confucian tradition says yes, through self-cultivation in community. The situationist critique in psychology says perhaps not — behavior may be more situation-determined than trait-determined. Illich says schooling cannot cultivate genuine character because its hidden curriculum produces the opposite. Japan's experience suggests that institutional design *can* cultivate character but risks conformism. The honest position: the evidence for reliable character cultivation through formal schooling is real but modest, the mechanisms are not well understood, and the risks (conformism, cultural imposition, hidden curriculum effects) are substantial. This is an area where "hopeful modesty" (Kristjánsson) is the appropriate epistemic stance.

9

THE AI QUESTION: WHAT CHANGES AND WHAT STAYS

The v1 review's treatment of AI relied on the routine-biased technological change framework (Autor, Levy, & Murnane, 2001) and informed speculation. The v2 review draws on five post-2022 empirical studies that transform the evidentiary landscape. The picture that emerges is more nuanced and in some respects more alarming than what v1 could offer.

9.1 9.1 THE JAGGED FRONTIER

The most important concept for understanding AI's impact on education is the "jagged technological frontier" from Dell'Acqua and colleagues' (2023) preregistered field experiment with 758 BCG consultants. The study found that AI (GPT-4) dramatically improved performance on tasks inside the current capability frontier — 25% faster, 30% higher quality — but *degraded* performance on tasks outside it, with AI users 19 percentage points *less likely* to produce correct solutions than those working without AI (Dell'Acqua et al., 2023).

The frontier is "jagged" because AI capability does not improve uniformly across task types. Tasks that appear superficially similar in cognitive complexity can fall on opposite sides: creative ideation may be inside the frontier while quantitative reasoning on the same topic is outside it. Because knowledge workers cannot reliably predict which situation they are in, the result is systematic overreliance precisely when human judgment is most needed — what Dell'Acqua and colleagues call "falling asleep at the wheel" (Dell'Acqua et al., 2023).

For curriculum, the jagged frontier has three implications. First, the question "what does AI do well?" is unanswerable without domain-specific knowledge — the frontier can only be identified from inside a domain, by someone with enough expertise to detect when AI output is plausible but wrong. This makes deep domain knowledge a *prerequisite* for effective AI use, not something AI renders optional. Second, the most important AI-era competency is not knowing *how* to use AI but knowing *when not to trust it* — a judgment competency (Layer 3 of the competence stack) that depends on content knowledge (Layer 1) and metacognitive vigilance (Layer 4). Third, overreliance on AI produces worse outcomes than no AI at all on outside-frontier tasks, which means introducing AI into education without developing the judgment to supervise it is actively counterproductive.

9.2 9.2 WHAT AI DOES TO THE VALUE OF DIFFERENT COMPETENCIES

Tyna Eloundou and colleagues' (2023) analysis of LLM exposure across 1,016 occupations produces the most counterintuitive finding in the AI literature: the skills most exposed to LLM substitution are not routine tasks but the skills traditionally at the core of academic education — writing (+0.467), reading comprehension (+0.470), and programming (+0.623). Meanwhile, the skills most *protected* from exposure are precisely the higher-order epistemic capacities: science (−0.230), critical thinking (−0.196), active learning (−0.209), and monitoring (−0.149) (Eloundou et al., 2023, Table 5).

This inverts the prior automation narrative. Previous waves of technology displaced routine cognitive work, reinforcing the value of academic education. The current wave displaces non-

routine cognitive work of the text-based, pattern-matching variety — exactly what traditional academic curricula train students to do. The skills that remain most protected are those that liberal education has always claimed to develop but that are hardest to operationalize and assess: scientific reasoning, critical thinking, active learning, monitoring. AI does not devalue them; it makes them more discriminating precisely because everything else becomes cheaper (Eloundou et al., 2023)•.

Brynjolfsson, Li, and Raymond's (2023) field study of AI-assisted customer support adds a complementary finding: AI helps the *least*-experienced workers most (34% productivity gain for the lowest skill quintile), while the most experienced workers see no gain — and in some measures, slight *decreases* in quality. The mechanism is that AI encodes expert tacit knowledge and delivers it to novices in real time. Novice workers with two months of AI-assisted experience performed as well as unassisted workers with six months of tenure (Brynjolfsson et al., 2023)•.

This has dual implications. On one hand, AI may democratize access to competence thresholds, compressing the experience curve dramatically. On the other, if the most experienced workers see degraded outcomes from AI use, the pipeline of tacit knowledge that the AI relies on for its recommendations may erode over time. The AI learns from experts; if experts stop developing expertise because AI handles the tasks that build it, the training signal degrades. This is speculative at present but represents a structural concern that Brynjolfsson and colleagues raise in their limitations.

9.3 9.3 METACOGNITIVE LAZINESS

Fan and colleagues' (2024) randomized experiment provides the most direct evidence for a curriculum implication: AI-assisted learners produced significantly better essays than all other groups, but showed *no difference* from controls on knowledge gain or knowledge transfer. The mechanism, identified through process-mining of learning behaviors, is that AI users engaged in far fewer metacognitive processes — evaluation, orientation, monitoring — instead looping repeatedly back to ChatGPT. Fan and colleagues term this pattern "metacognitive laziness" and argue it is the mechanism by which short-term performance gains coexist with absent learning (Fan et al., 2024)•.

The finding dissociates the observable product of learning (essay quality, rubric scores) from the underlying cognitive change (knowledge acquisition, transfer ability). This is the post-2022 instantiation of the performance-learning distinction from the desirable difficulties literature: productive struggle, disfluency, and self-monitoring are not inefficiencies in the learning process but *are* the process. AI removes them by providing the answer before the struggle completes.

For the competence stack's Layer 4 (metacognition), the implication is specific: metacognitive capacity is actively at risk of being eroded by AI-rich learning environments if tools are introduced without deliberate pedagogical scaffolding. Curricula that introduce AI without protecting the learner's own regulatory processes may produce graduates who perform well on AI-supported tasks but cannot function when the AI is unavailable, inaccurate, or absent. A curriculum must deliberately preserve AI-free zones of effortful practice alongside AI-augmented zones.

The "metacognitive laziness" construct is new and not yet validated with a proper measurement instrument — it should be treated as a hypothesis-generating finding rather than established science. But the behavioral pattern documented in the process-mining data is direct observational evidence, and the pedagogical implication follows even from the weaker claim: if there is a plausible mechanism by which AI suppresses the metacognitive behaviors associated with durable learning, curricula must protect those behaviors by design.

9.4 9.4 INEQUALITY AND ACCESS

Capraro and colleagues (2024) add the distributional dimension: AI's democratizing potential (personalized learning, access to expertise) is offset by access gaps stratified by gender, geography, and income. Female students already use ChatGPT less frequently than male counterparts. Global South workers face substantial infrastructure barriers. And if firms exploit the higher interchangeability between workers that AI produces, productivity gains may never translate into wage improvements for workers (Capraro et al., 2024)•.

The curriculum implication is that AI literacy — understanding what LLMs are, evaluating their output, communicating effectively with and without AI assistance — is now part of the minimum viable adult competence set, and that unequal access to this literacy is a new axis of educational inequality. But AI literacy alone is insufficient: workers also need labor-market knowledge and collective action capacity to ensure that productivity gains from AI tools are not fully captured by employers.

9.5 9.5 WHAT WE DO NOT KNOW

The honest uncertainty is substantial. We do not know whether the jagged frontier is stable or will advance uniformly. We do not know whether metacognitive laziness compounds over educational careers or attenuates as learners develop AI-working strategies — this is perhaps the most important unanswered question for curriculum design and has no current empirical answer. We do not know how the "inverse skill-bias" (AI helping low-skill workers most) interacts with the jagged-frontier finding (AI degrading high-skill workers on outside-frontier tasks). We do not know how AI's labor-market effects will distribute — whether exposure means displacement, augmentation, or wage capture by employers. We do not know what "AI literacy" actually means as a curriculum target; the practitioner discourse is running far ahead of the research. And we do not know how quickly current findings expire: all five studies were conducted with 2023-era models, and the findings are indexed to a moment in a rapidly changing capability landscape.

9.6 9.6 WHAT THE AI TRANSITION DOES AND DOES NOT CHANGE

What AI changes:

- The *relative value* of different competencies shifts. Writing, reading comprehension, and programming — skills at the core of traditional academic curricula — are now more exposed than manual work. Science, critical thinking, and active learning are the most protected. - *Metacognition* becomes more important, not less, because AI creates new risks of cognitive offloading that undermine durable learning. - *Domain knowledge* becomes more critical for AI supervision, not less critical because AI "knows things" — the jagged frontier can only be identified by someone who knows the domain well enough to detect plausible errors. - *AI literacy* joins reading, writing, and numeracy as a baseline competency for economic participation. - *Judgment* — the ability to discern when to trust AI and when to override it — becomes the most discriminating competency in professional work.

What AI does not change:

- The philosophical foundation. The capabilities approach, Dewey's growth, Freire's liberation, Bildung's self-formation, Confucian self-cultivation — these are about what it means to be a fully developed human being, and that question is not altered by the tools available. - The centrality of relationships. AI cannot substitute for the warm human connection that longitudinal research

identifies as the strongest predictor of flourishing. - The importance of character. Practical wisdom, intellectual honesty, and the disposition to engage with reality rather than perform confidence remain essential — and may become more so as AI makes it easier to produce the appearance of competence without its substance. - The knowledge-skills synthesis. The resolution — deep knowledge and the capacity to deploy it, inseparable — applies whether the deployment involves AI tools or not.

10

CLOSING ASSESSMENT

10.1 10.1 WHAT A CURRICULUM DESIGNER CAN CONFIDENTLY BUILD ON

A curriculum designer at Applied Pedagogy can build on the following with confidence grounded in converging evidence across philosophy, longitudinal research, positive psychology, cognitive science, curriculum theory, cross-cultural comparison, and practitioner experience:

The aim of education is to develop capable, autonomous, socially connected persons who can continue to develop throughout their lives. Every philosophical tradition and every body of empirical evidence points in this direction. Education that produces people who know many things but cannot manage themselves, cannot form relationships, and cannot continue learning has failed by the standards of every tradition examined.

Relational capability deserves as much curricular attention as academic capability. The Grant Study, the Kauai Study, SDT, the Confucian relational ontology, Japan's tokkatsu, and multiple philosophical traditions converge: the capacity for warm, reciprocal relationship is the strongest predictor of adult flourishing and the most neglected dimension of conventional education.

Both knowledge and the capacity to deploy it are essential — and they are inseparable. The knowledge-skills dichotomy is false. Willingham's cognitive science, Hirst's forms of knowledge, Klafki's categorical Bildung, Young's powerful knowledge, and Wang Yang-ming's unity of knowing and acting all converge: knowledge is what thinking operates on, and thinking is how knowledge becomes competence. Curriculum must develop both through integrated engagement with disciplinary content, not as separate tracks.

Self-regulation should be cultivated through environmental design, not through direct training alone. The updated self-regulation evidence points toward creating predictable, warm, low-stress environments where self-regulation develops naturally, supplemented by holistic programs that embed cognitive challenge within rich, meaningful activity. Discrete self-control training produces narrow effects.

Character formation is education's business, not an optional enrichment. Every philosophical tradition, every national curriculum examined, and the empirical evidence on character strengths and practical wisdom converge: a curriculum that does not attend to character development is incomplete. But character education must be approached with "hopeful modesty," awareness of the risks of conformism and cultural imposition, and preference for experiential cultivation over didactic instruction.

Critical consciousness and epistemic competence are newly urgent. In an era of AI-generated content, algorithmic manipulation, and rapid social change, the ability to perceive reality accurately, evaluate information critically, detect one's own biases, and act thoughtfully is not a luxury but a survival skill. The rationality community's demonstration that calibration is trainable, combined with Fan and colleagues' finding that AI erodes metacognition, makes the case for explicit epistemic training in the curriculum.

Practical life competence should not be left to chance. Financial literacy, health literacy, domestic skills, and bureaucratic navigation are necessary for adult independence and systematically absent from conventional curricula. The practitioner evidence identifies this as one of the largest gaps between what adults need and what schools provide.

The curriculum should be organized around depth, not breadth. Whitehead, the expertise literature, Klafki's exemplary content, and Japan's yutori lesson all converge: deep engagement with fewer domains produces better transfer, better understanding, and more robust competence than surface coverage of many domains.

10.2 10.2 WHAT REMAINS FOR THE PI TO DECIDE

Several choices cannot be resolved by research and require the PI's value judgments:

How much curricular prescription is appropriate? The evidence supports deep knowledge in disciplinary domains, but which domains and how many remains a normative choice. Hirst's seven forms of knowledge, Klafki's epoch-typical key problems, and the national curricula offer starting points but not determinate answers.

What balance between individual development and communal formation? The Western emphasis on individual autonomy and the Confucian/Japanese/Ubuntu emphasis on relational belonging point in somewhat different directions. Applied Pedagogy's curriculum must decide how much weight to give each — and the decision will shape classroom structures, assessment approaches, and institutional culture.

How to handle cultural specificity. Some knowledge is culturally specific. How much of the curriculum should be universal and how much locally situated? The capabilities approach offers a framework (universal architecture, locally filled), but the actual filling is a cultural and normative decision.

How to sequence development. The convergence map identifies *what* to develop but the question of *when* — which capacities at which ages, in which sequence — requires developmental science and practical judgment. The competence stack's layers suggest a rough sequence (knowledge before judgment before practical wisdom), but the Confucian and Japanese evidence shows that character formation need not wait for cognitive maturity.

How radically to depart from conventional schooling. Illich's critique, Japan's tokkatsu, and Freire's problem-posing education all suggest that the structure of conventional schooling — age- grading, subject compartmentalization, teacher-directed instruction, grades — may itself be incompatible with the educational aims identified here. The PI must decide how much of the conventional structure to retain and how much to redesign.

How to introduce AI into the curriculum. The evidence argues strongly for preserving AI-free zones of effortful practice alongside AI-augmented work, for developing the judgment to supervise AI before relying on it, and for protecting metacognitive development from erosion. But the specific implementation — when AI is introduced, in which subjects, with what scaffolding — is a design decision the evidence informs but does not determine.

10.3 10.3 THE HARDEST QUESTION

The PI's distinctive concern — what does a young person need by 18 to thrive in a world restructured by AI? — is the question no academic field has fully answered. This investigation has assembled the best available materials for answering it: twelve philosophical traditions spanning seven cultures, sixteen books read at full text, the psychology of flourishing, the self-regulation replication evidence, the sociology of curriculum knowledge, four national curricula, five post-2022 AI studies, and five practitioner communities subjected to systematic gap-detection analysis.

The materials point toward something like this: a well-educated 18-year-old should have deep knowledge in several domains and the capacity to deploy it with judgment. They should be able to

form and maintain warm relationships, regulate their own emotions and attention, and continue developing throughout their lives. They should have the epistemic competence to evaluate claims, detect biases (including their own), and navigate AI-mediated information with appropriate skepticism. They should have practical competence in managing their own life — health, finances, household, legal and bureaucratic systems. They should have the character dispositions — intellectual honesty, courage, persistence, compassion — that the longitudinal evidence shows predict flourishing and that the philosophical traditions identify as constitutive of the educated person. And they should understand that reality is not fixed but is the product of human action and can be changed by human action — Freire's most enduring insight.

They should be, in Nussbaum's terms, someone who has reached a threshold of capability across the dimensions of a dignified human life. In Dewey's terms, someone whose capacity for growth has been strengthened. In Peters's terms, someone who is "on the inside" of knowledge — who not only knows but cares about knowing well. In Freire's terms, someone who can read the world and act on it. In Tu Weiming's terms, someone whose self-cultivation unfolds through relationship with others and engagement with the world. In Whitehead's terms, someone who possesses not just knowledge but style — "the ultimate morality of mind."

This is not a curriculum. It is the beginning of one. The work of translating these aims into specific learning experiences, content selections, assessment approaches, and institutional designs — the work of curriculum design proper — lies ahead. But it begins from a foundation that is philosophically grounded across multiple traditions, empirically informed by the best available longitudinal and experimental evidence, cross-culturally tested against the world's most successful educational systems, and honest about both its certainties and its limits.

The v1 review concluded with a similar assessment, and the broad conclusion has not changed. What has changed is the depth of the foundation. The philosophical case is now grounded in primary texts rather than training knowledge. The empirical case is now informed by the psychology of flourishing rather than limited to childhood predictors. The self-regulation narrative is more honest. The cross-cultural evidence is richer. The AI analysis is evidence-based rather than speculative. And the practitioner literature has been mined not just for supporting evidence but for research gaps that academia has not addressed.

The most important thing this review can offer the PI is not a conclusion but an honest map — of what multiple independent traditions converge on, where the genuine disagreements lie, and where the evidence runs out and values must begin. The convergences are substantial and the PI can build on them with confidence. The disagreements are real and require decisions that research cannot make. And the gaps — especially the practitioner-identified phenomena documented in ‘gaps-v2.md‘ — represent the frontier of what we do not yet know about how to educate human beings well.

The question "what should a person learn?" has been asked for millennia. The AI transition has made it newly urgent. This review is one research team's best attempt to assemble the answer — or rather, to assemble the materials from which a curriculum designer who takes both evidence and values seriously can construct their own.

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