WHAT SHOULD BE LEARNED

A Cross-Disciplinary Investigation of the Aims of Education

Applied Pedagogy Research Lab

Guido Bartolucci, Principal Investigator

guido@appliedpedagogy.com

LAB.APPLIEDPEDAGOGY.COM

L1-008 · March 2026

Research conducted by AI agents (Claude, Anthropic) under human direction.
See LAB.APPLIEDPEDAGOGY.COM for methodology and verification framework.

CONTENTS

Part I

THE QUESTION

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 to this question. 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. 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 is the right framework. But that does not mean all frameworks are equally well-considered, and part of this investigation's task is to identify which frameworks are most rigorous, most cross-culturally robust, and most practically useful.

A secondary question gives this investigation urgency: how does the answer change when artificial intelligence restructures the economy and the nature of knowledge work? The routine-biased technological change framework (Autor, Levy, & Murnane, 2001) has already demonstrated that technology systematically displaces routine cognitive and manual tasks while increasing demand for non-routine analytical, interpersonal, and manual skills. The current wave of generative AI extends this further, potentially automating tasks that were previously considered non-routine cognitive work — writing, analysis, coding, even some forms of judgment. If these trends continue, the implications for what education should prioritize are profound. But we must be honest about how much of this is evidence and how much is speculation.

This dissertation proceeds as follows. We begin with the philosophical foundations — the major frameworks that exist for thinking about what education should produce in a person. We then examine the empirical evidence from longitudinal and developmental research on what actually predicts adult outcomes. We survey the curriculum theory that exists for translating aims into learning objectives. We assess the knowledge-versus-skills debate that has divided educators for decades. We examine what national and international competency frameworks have converged on, and we look at cross-cultural and practitioner evidence about what competent adults actually need. We address the AI transition. And we close with an assessment of what a curriculum designer can build on and what remains irreducibly a matter of values.

Throughout, we will be looking for convergences. When Nussbaum's capabilities approach, Dewey's philosophy of growth, Freire's liberation pedagogy, Heckman's economics, the Bildung tradition, and Ubuntu philosophy all point in the same direction, that convergence deserves serious attention. When they genuinely disagree, that disagreement deserves honest examination rather than artificial resolution.

Part II

FOUNDATIONS

2 THE PHILOSOPHICAL FOUNDATIONS

2.0.1 *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 (1999), provides the most systematic philosophical answer to the question "what should education produce?" (Nussbaum, 2011). The approach begins with a simple but radical question: what is each person actually able to do and to be? It shifts attention from aggregates (GDP, test scores) to individuals, and from resources to the freedoms those resources enable.

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 (internal capability) 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.

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 our purposes, capabilities 4 (Senses, Imagination, and Thought), 6 (Practical Reason), and 7 (Affiliation) are most directly educational. 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, p. 33). Capability 6 — "being able to form a conception of the good and to engage in critical reflection about the planning of one's life" — describes what many would recognize as the ultimate purpose of education: autonomous practical reasoning.

The capabilities approach has several strengths as a foundation for curricular thinking. It is specific enough to guide decisions (unlike Sen's deliberately unspecified version). It is pluralistic — the list spans physical, emotional, social, cognitive, and political dimensions rather than reducing education to cognitive development alone. It insists on a threshold: every person should reach a minimum level in every capability, which implies that education cannot simply develop students' existing strengths but must ensure baseline competence across all dimensions. And it focuses on what people can *do and be*, not merely what they know — a distinction that aligns with the growing emphasis on competence over content.

The approach has significant limitations, however. The ten capabilities are presented as universal, but critics argue they reflect Western liberal values — particularly the emphasis on individual autonomy and political participation. Nussbaum has responded to this criticism extensively, arguing that the capabilities are defensible across cultural traditions and that they protect space for cultural variation rather than imposing a single vision of the good life. But the tension between universalism and cultural pluralism is real and not fully resolved. More practically, the 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 — which is where curriculum theory enters.

2.0.2 *2.2 Dewey: Education as Growth*

John Dewey's *Democracy and Education* (1916) takes a fundamentally different approach to the question of educational aims. Where Nussbaum specifies what education should produce, Dewey resists specification entirely. His central claim is that "the aim of education is to enable individuals to continue their education — or that the object and reward of learning is continued capacity for growth" (Dewey, 1916, Ch. 8).

This is not evasion; it is a principled philosophical position. Dewey argues that any educational aim imposed from outside the process of education itself will be distorting. Aims must be "an outgrowth of existing conditions," must be "flexible" and "capable of alteration to meet circumstances," and must represent "a freeing of activities" rather than a fixed terminus (Dewey, 1916, Ch. 8). An aim that is externally imposed "limits intelligence because, given ready-made, it must be imposed by some authority external to intelligence, leaving to the latter nothing but a mechanical choice of means."

Dewey's concept of growth is richer than it may appear. Growth is not random development but intelligent activity directed by foresight: "acting with an aim is all one with acting intelligently." It 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). Growth also requires *dependence* — not as weakness but as social capacity. Dewey insists that human development is inherently social and that the capacity for interdependence is a strength, not a liability.

The implications for curriculum are profound. If the aim of education is continued growth rather than achievement of a fixed end, then the question is not "what content must all students learn?" but rather "what experiences develop the capacity for intelligent, self-directed, socially connected growth?" This shifts attention from *what* to *how* — from content specifications to the quality of educational experience. Dewey would argue that a curriculum that produces students who can pass tests but have lost their curiosity and capacity for self-direction has failed, regardless of how much content it has covered.

The tension between Dewey and Nussbaum is productive rather than destructive. Nussbaum provides the *what* — a philosophically grounded account of the dimensions along which people should be able to function. Dewey provides the *how* — a warning that these aims must remain flexible, experimental, and internal to the educational process rather than imposed as external standards. A curriculum designer who takes both seriously will specify broad domains of development (following Nussbaum) while insisting that the specific content within those domains must emerge from the interaction of student, teacher, subject matter, and context (following Dewey and Schwab).

2.0.3 *2.3 Freire: Education for Liberation*

Paulo Freire's *Pedagogy of the Oppressed* (1970) adds a dimension that neither Nussbaum nor Dewey foregrounds: the political question of whose interests educational aims serve. Freire's critique of the "banking concept" of education — in which the teacher deposits knowledge into passive student-receptacles — is not merely pedagogical but political. The banking concept "transforms students into receiving objects," training them to adapt to an existing reality rather than to question and

transform it (Freire, 1970, Ch. 2). This serves the interests of those who benefit from the existing order.

Freire's alternative — "problem-posing education" — treats education as "acts of cognition, not transferrals of information." Teacher and students become "jointly responsible for a process in which all grow." The aim is *conscientização* — the development of critical consciousness, the capacity to perceive social, political, and economic contradictions and to take action against the oppressive elements of reality. For Freire, education that does not develop this capacity is not neutral — it is actively domesticating.

Freire's contribution to the question "what should be learned?" is not a list of content but a criterion: whatever is learned should develop the learner's capacity to read the world critically and act to transform it. Education should produce people who understand that reality is not fixed but is the product of human action and can be changed by human action. People are "beings in the process of becoming — as unfinished, uncompleted beings in and with a likewise unfinished reality" (Freire, 1970, Ch. 2).

The relevance of Freire to Applied Pedagogy's project depends on one's view of the social context. In overtly oppressive situations (Freire's primary context was literacy work with Brazilian peasants), the liberation framework is directly applicable. In affluent democratic societies, the application is less straightforward — but not irrelevant. If curriculum choices are made by institutions that systematically exclude certain perspectives or serve certain economic interests, then Freire's question — "who benefits from this answer to 'what should be learned?' " — remains urgent. The hidden curriculum of conventional schooling — compliance, passivity, acceptance of authority — may serve the interests of employers seeking tractable workers more than the interests of students seeking flourishing lives.

2.0.4 *2.4 The Bildung Tradition: Self-Formation Through Encounter with the World*

The German tradition of *Bildung* — self-formation or self-cultivation — deserves separate treatment because it represents arguably the most developed Western tradition of thinking about what education should form in a person. Where Anglo-American philosophy of education tends to oscillate between content-focused and process-focused approaches, the Bildung tradition insists that the two are inseparable.

Wilhelm von Humboldt's original vision (early 19th century) conceived of Bildung as the all-round development of the individual through encounter with the broadest possible range of human experience. Education should produce not a specialist but a whole person — someone whose cognitive, aesthetic, moral, and physical capacities have all been developed. This influenced the structure of German *Gymnasium* education, with its emphasis on classical languages, philosophy, science, and the arts as equally essential components of a complete education.

Wolfgang Klafki's 20th-century revision — "categorical Bildung" — attempted to make the tradition more concrete and socially responsive (Klafki, 1995). Klafki argued that educational content should be selected for its capacity to illuminate "epoch-typical key problems" — the defining challenges of the era. In his time, these included peace, environment, inequality, and technology. The genius of Klafki's approach is that it provides a principled basis for content selection that is neither arbitrary nor static: what counts as an epoch-typical key problem changes as the world changes. If we updated Klafki's list for our era, the AI transition, climate change, democratic decline, and global inequality would all be candidates. Education should enable students to understand and engage with these challenges — not merely to be aware of them but to think productively about them.

The Bildung tradition converges with the capabilities approach in several ways. Both insist on all-round development rather than narrow specialization. Both see education as developing the capacity for autonomous judgment. Both take the content of education seriously — it is not enough to develop "generic skills"; the specific knowledge and experience that forms the person matters. Where they diverge is in their relationship to culture: Bildung is deeply embedded in the German humanistic tradition and may not transfer straightforwardly to other cultural contexts (Sjöström & Eilks, 2018; Horlacher, 2016). But the core insight — that education should form the whole person through meaningful encounter with significant content — transcends any single cultural tradition.

2.0.5 *2.5 Ubuntu: Personhood Through Relationship*

The Ubuntu philosophy — "I am because we are" (*umuntu ngumuntu ngabantu*) — offers a fundamentally different starting point from Western frameworks. Where Nussbaum, Dewey, and the Bildung tradition all foreground the development of the individual (even when they acknowledge social interdependence), Ubuntu locates personhood itself in relationship. A person is not first an individual who then enters relationships; a person *becomes* a person through relationships with others (Letseka, 2012).

The educational implications are significant. If personhood is constituted by relationship, then the goal of education is not primarily to develop individual capabilities (though this may be a byproduct) but to develop the capacity for right relationship — for mutual recognition, communal responsibility, and social harmony. The "competent adult" in an Ubuntu framework is not the autonomous individual of liberal philosophy but the person who contributes to the flourishing of the community and draws their own flourishing from it.

This challenges the individualism implicit in most Western competency frameworks. When the OECD specifies "student agency" or Nussbaum specifies "practical reason" as a central capability, they are describing individual capacities. Ubuntu would ask: agency for what? Reason directed toward what ends? If the answer is "the individual's own chosen life plan," Ubuntu would respond that this framing itself reflects a particular cultural understanding of personhood that is neither universal nor obviously superior.

The question for Applied Pedagogy is not whether to adopt Ubuntu wholesale — its embeddedness in African communal traditions makes simple transplantation inappropriate. The question is what Ubuntu reveals about the blind spots of Western frameworks: their tendency to treat individual autonomy as the default aim of education, their relative neglect of communal bonds and collective flourishing, and their assumption that the individual is the proper unit of analysis for thinking about educational outcomes.

2.0.6 *2.6 What the Philosophical Traditions Converge On*

Despite their real differences, these traditions exhibit a striking convergence on several points:

Education should develop the whole person, not just the intellect. Nussbaum's ten capabilities span physical, emotional, social, cognitive, political, and aesthetic dimensions. Dewey's growth encompasses all of experience. Freire's conscientization involves the unity of reflection and action. Bildung means the formation of the complete person. Ubuntu emphasizes social and moral development alongside practical competence. No serious philosophical tradition reduces education to cognitive development alone.

Education should develop agency — the capacity to act on the world, not merely adapt to it. Nussbaum's "practical reason," Dewey's "intelligent activity directed by foresight," Freire's "praxis,"

Klafki's engagement with "epoch-typical key problems," and Ubuntu's communal responsibility all point toward the same thing: a well-educated person is one who can perceive their situation, form purposes, and act on them. Passivity and compliance are educational failures in every tradition.

Education is not merely preparation for a fixed future; it develops the capacity for continued development. Dewey is most explicit about this, but the point is present everywhere. Nussbaum's capabilities are not terminal states but ongoing capacities. Freire's people are "beings in the process of becoming." Bildung is a never-completed process of self-formation. Even Ubuntu's relational personhood is something that is continually enacted, not achieved once.

The content of education matters — it is not enough to develop "generic skills." This is where the philosophical traditions align against a naïve reading of the "21st century skills" movement. Nussbaum specifies that the senses, imagination, and thought must be "informed and cultivated by an adequate education." Bildung insists that self-formation requires meaningful encounter with substantive content. Even Dewey, who resists content specifications, argues that intelligent growth requires genuine subject matter, not contentless process. Freire's problem-posing education requires real problems to pose — problems rooted in the learners' actual situation in the world.

Where they genuinely disagree is on the degree of specificity appropriate for educational aims. Nussbaum specifies ten capabilities. Dewey specifies only "continued capacity for growth." Freire specifies only "critical consciousness." The Bildung tradition specifies domains of encounter (humanistic, scientific, aesthetic) but not specific content. This disagreement is not resolvable by evidence — it reflects deep philosophical differences about the relationship between freedom and structure in education. A curriculum designer must make a judgment call about where on this spectrum to operate.

3 THE EMPIRICAL EVIDENCE

3.0.1 *3.1 The Dunedin Study: Self-Control and Life Outcomes*

The single most powerful piece of evidence on what childhood capacities predict adult outcomes comes from the Dunedin Multidisciplinary Health and Development Study. Moffitt and colleagues (2011) followed 1,037 children born in Dunedin, New Zealand, in 1972–73 from birth to age 32, measuring childhood self-control through multiple methods (teacher ratings, parent ratings, observer ratings, and self-reports) at ages 3, 5, 7, 9, and 11.

The results were striking. Childhood self-control predicted adult outcomes across three independently important domains — physical health, substance dependence, personal finances, and criminal behavior — in a gradient pattern. At every level of self-control, more was better. This was not a threshold effect (where you need a minimum and more doesn't help) but a continuous gradient. Critically, these effects held after controlling for IQ and social class, and a sibling-difference design (comparing siblings with different levels of self-control within the same family) confirmed the relationship.

The implications for education are significant but must be stated carefully. The study demonstrates that self-regulation — the capacity to manage impulses, sustain attention, persist through difficulty, and defer gratification — is one of the most robustly predictive capacities identified by longitudinal research. But "self-control" as measured in this study captures a complex mix of temperament, environment, and learned behavior. The study does not tell us how much of this capacity is malleable or how education can develop it. It tells us what matters; it does not tell us how to teach it.

3.0.2 *3.2 Heckman and the Economics of Human Capabilities*

James Heckman's work on the economics of skill formation has been profoundly influential in shifting how economists think about education (Cunha, Heckman, Lochner, & Masterov, 2005). His key findings include:

1. Both cognitive and non-cognitive skills predict life outcomes — but non-cognitive skills (motivation, self-regulation, social skills, conscientiousness) predict outcomes *beyond what cognitive skills predict*. IQ and academic test scores are important, but they are not sufficient.

2. Skills are produced by families, schools, and environments interacting with innate abilities. The production function is dynamic — "skills beget skills," meaning early investments have higher returns because they create the foundation for later skill development.

3. Non-cognitive skills appear to be more malleable than cognitive skills during adolescence. The window for changing IQ narrows after childhood, but motivation, self-regulation, and social skills remain responsive to intervention through the teenage years and beyond.

4. The rate of return on early childhood investment is higher than on later investment — not because early learning is magic, but because early skills create the platform for later learning.

This is the "Heckman equation" that has driven so much policy attention to early childhood education.

The implications for the "what should be learned?" question are that education should develop not only cognitive capabilities (knowledge and thinking skills) but also the non-cognitive capabilities — self-regulation, social skill, persistence, conscientiousness — that predict life outcomes independently. This aligns with the philosophical frameworks: Nussbaum's capabilities span cognitive and non-cognitive dimensions; Dewey's growth encompasses all of experience; the Bildung tradition insists on all-round development.

3.0.3 *3.3 The Perry Preschool Study*

The High/Scope Perry Preschool Study (Schweinhart et al., 2005) remains one of the most important pieces of evidence in education policy. It randomly assigned 123 low-income African American children in Ypsilanti, Michigan, to either a high-quality preschool program or no program in the 1960s, then followed them for 40 years.

By age 40, the program group showed significantly better outcomes across nearly every measured domain: higher earnings, higher rates of home ownership, lower rates of arrest, higher educational attainment. Heckman's reanalysis estimated a 7–10% annual rate of return on the investment — far exceeding typical financial investments.

The most important finding for our purposes is that the Perry program did not primarily teach academic content. Its effect on IQ faded within a few years. What persisted were effects on non-cognitive skills — the dispositions and behaviors that predict adult success. The program developed children's executive function, social skills, and capacity for self-directed activity. This is strong evidence that what education develops in the person — the capabilities, dispositions, and habits — may matter more for long-term outcomes than the specific knowledge transmitted.

The study's limitations are significant: very small sample, one racial group, one historical period, one city, one specific program. But its findings converge with the Heckman framework and the Moffitt results to paint a consistent picture: childhood development of self-regulation, social capability, and executive function predicts adult outcomes robustly.

3.0.4 *3.4 The Grant Study: Relationships and Flourishing*

The Harvard Grant Study, which followed 268 Harvard men from the late 1930s for 75 years (Vaillant, 2012), offers a different kind of evidence. Its headline finding — that the warmth of relationships was the strongest predictor of life satisfaction and health in old age — is both powerful and limited. "Happiness is love. Full stop," Vaillant concluded.

The study found that mature defense mechanisms (altruism, humor, sublimation, suppression) predicted better outcomes than immature ones (projection, acting out, passive aggression). Men who developed the capacity for intimate, reciprocal relationships fared better across nearly every measure of wellbeing. Professional success and income were less predictive of late-life satisfaction than the quality of close relationships.

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. This converges with Nussbaum's Affiliation capability, Ubuntu's relational personhood, and Deming's (2017) finding that social skills are increasingly important in the labor market. However, the Grant Study's severe selection bias (all male, all Harvard, all white, one historical cohort) limits its generalizability.

3.0.5 *3.5 The Growing Importance of Social Skills*

David Deming's (2017) analysis of U.S. labor market data provides the economic complement to the developmental evidence. He demonstrates that since 1980, employment and wage growth have been concentrated in jobs requiring high levels of both cognitive and social skill. Jobs requiring social skills grew much faster than those requiring only cognitive or routine skills.

Deming defines social skill as the ability to work with and through other people — reading social cues, coordinating, negotiating, persuading. His framework suggests that the labor market increasingly rewards a combination of cognitive capability and interpersonal capability, not either alone. The highest-paying and fastest-growing occupations require both analytic thinking and the ability to collaborate, communicate, and lead.

This finding has direct implications for curriculum design. Education that develops cognitive capability alone (as many academic curricula do) leaves students without the social capabilities that the labor market increasingly demands. Conversely, education that develops "soft skills" without substantive knowledge produces people who are pleasant to work with but have nothing to contribute. The evidence points toward developing both — knowledge and social capability together, not as separate tracks.

3.0.6 *3.6 What the Empirical Evidence Converges On*

The longitudinal and economic evidence converges on several findings:

Self-regulation is foundational. The Dunedin study, Perry Preschool, and Heckman's framework all point to self-control/self-regulation/executive function as one of the most important capabilities for adult outcomes. This is the meta-skill that enables all other learning and achievement.

Social capability matters independently of cognitive capability. The Grant Study, Deming's labor market analysis, and the Perry Preschool results all indicate that the capacity for relationship, cooperation, and interpersonal engagement predicts outcomes beyond what cognitive skills predict.

Non-cognitive skills may be more important than commonly recognized. Heckman's finding that non-cognitive skills predict outcomes beyond IQ, and that they remain malleable through adolescence, suggests that education may underweight dispositions relative to knowledge.

The evidence is backward-looking. The most significant limitation of this evidence is that it measures what mattered in the past. The Dunedin children grew up in 1970s–1990s New Zealand. The Perry children grew up in 1960s–1970s Michigan. The Grant Study men lived through the mid-20th century. Whether the same capacities will predict flourishing in an AI-transformed future is an open question.

4

CURRICULUM THEORY

4.0.1 *4.1 Tyler's Rationale: The Standard Framework*

Ralph Tyler's *Basic Principles of Curriculum and Instruction* (1949) remains the foundational framework for curriculum design. Tyler posed four questions that every curriculum must answer: What educational purposes should be sought? What experiences achieve these purposes? How should these experiences be organized? How can we determine whether purposes are being attained?

Tyler identified three sources for educational objectives: studies of the learners themselves (their needs, interests, developmental stage), studies of contemporary life (what the society requires), and suggestions from subject-matter specialists (what each discipline contributes). These three sources generate too many possible objectives; Tyler proposed filtering them through two screens: the educational philosophy of the institution and the psychology of learning.

Tyler's framework is powerful in its simplicity but has been criticized for its linearity — it assumes objectives can be specified in advance and that the rest of curriculum design follows from them. This is precisely the assumption that Dewey and Freire challenge. Nevertheless, Tyler's three sources remain the standard way of thinking about *where* educational objectives come from, even for those who reject his linear process model.

4.0.2 *4.2 Schwab: Curriculum as Deliberation*

Joseph Schwab's "The Practical" (1969) offered a fundamental alternative to Tyler's rationalism. Schwab argued that curriculum is not a theoretical problem to be solved but a practical one requiring deliberation among four "commonplaces": the learner, the teacher, the subject matter, and the milieu (the institutional and social context). No theory can determine what should be taught; this requires practical judgment in specific situations.

Schwab's insight is essential for this investigation. It suggests that the question "what should be learned?" cannot be answered once and for all by any framework — philosophical, empirical, or policy-based. It must be answered through ongoing deliberation that takes into account the specific learners, the specific community, and the specific moment in history. This does not mean anything goes; it means that general frameworks (like Nussbaum's capabilities or the OECD's competency frameworks) are starting points for deliberation, not final answers.

4.0.3 *4.3 Backward Design: Starting with Understanding*

Wiggins and McTighe's *Understanding by Design* (1998/2005) provides the most practically influential framework for translating aims into curriculum. Their "backward design" approach begins with desired understandings and performances (Stage 1), then designs assessments that would demonstrate these understandings (Stage 2), and only then plans learning activities (Stage 3).

The key insight is that curriculum design should begin with "what do we want students to understand and be able to do?" not "what activities should we do?" or "what textbook should we use?" Wiggins and McTighe distinguish "enduring understandings" — the big ideas and core

processes that have lasting value — from "knowledge worth being familiar with" and "important knowledge and skills." Not everything is equally important, and curriculum design requires choices about what matters most.

This framework provides a practical bridge between philosophy and practice. A curriculum designer who has identified the philosophical aims (capabilities, growth, liberation, Bildung) can use backward design to translate them into specific learning goals, assessments, and activities. The question then becomes: what are the "enduring understandings" that education should aim for? This is where the evidence base — longitudinal research, labor market data, cross-cultural comparison — becomes relevant.

4.0.4 *4.4 Powerful Knowledge: The Case for Disciplinary Content*

Michael Young's concept of "powerful knowledge" (2008) offers a sociological argument for specific curricular content. Young argues that schools should teach knowledge that gives students epistemic access to understanding the world in ways that everyday experience cannot. Disciplinary knowledge — scientific theories, historical analysis, mathematical reasoning, literary interpretation — is "powerful" precisely because it enables understanding that is not available through common sense alone.

Crucially, 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. When schools fail to teach disciplinary knowledge in the name of relevance or student-centeredness, they effectively reproduce social inequality by denying disadvantaged students the intellectual tools that advantaged students acquire elsewhere.

Young's argument converges with Hirsch's (1987) case for cultural literacy and Willingham's (2009) cognitive science argument that background knowledge is the foundation of thinking. But Young adds a social justice dimension that Hirsch lacks: the argument is not merely that knowledge matters for cognitive performance but that access to powerful knowledge is a right, not a privilege.

Part III

SYNTHESIS

5 THE KNOWLEDGE-SKILLS SYNTHESIS

5.0.1 *5.1 The False Dichotomy*

The debate between "knowledge-centered" and "skills-centered" education has consumed enormous energy in education policy and practice. Hirsch (1987) and the Core Knowledge movement argue for a content-rich curriculum built on shared cultural knowledge. The "21st century skills" movement argues for transferable competencies — critical thinking, collaboration, creativity, communication. In practice, these positions have often been treated as mutually exclusive: either you prioritize knowledge or you prioritize skills.

The cognitive science evidence strongly suggests this is a false dichotomy. Willingham (2009) synthesizes decades of research showing that thinking is domain-specific and knowledge-dependent. You cannot think critically about something you know nothing about. Working memory is severely limited (roughly four items at a time), so fluent thinking depends on having relevant knowledge organized in long-term memory. "Critical thinking" is not a generic skill that transfers automatically across domains — it is deeply tied to domain knowledge.

At the same time, knowledge without the capacity to use it is inert. Knowing facts about history does not automatically enable historical reasoning. Knowing scientific concepts does not automatically enable scientific thinking. The capacity to apply knowledge — to reason, analyze, synthesize, evaluate — requires both knowledge and practice in using it within the relevant domain.

5.0.2 *5.2 What Cognitive Science Says*

The research on expertise and transfer, surveyed in the Lo-001v2 dissertation, consistently shows that expertise is domain-specific. Expert chess players' superior memory and reasoning do not transfer to other domains. Expert physicists' problem-solving strategies do not transfer to biology. The "general skills" that competency frameworks aspire to develop — critical thinking, problem solving, creativity — turn out to be largely domain-specific in their expression.

This does not mean that no transfer occurs. The Lo-001v2 survey identified that transfer is more likely when students learn underlying principles rather than surface procedures, when they practice applying knowledge in varied contexts, and when they develop metacognitive awareness of their own thinking. But the kind of effortless, automatic transfer that "21st century skills" frameworks assume — learn to think critically in one domain and apply it everywhere — is not well-supported by the evidence.

The implication for curriculum design is that students need both: deep knowledge in specific domains *and* explicit practice in transferring and applying that knowledge across contexts. The knowledge provides the foundation; the practice provides the flexibility. Neither alone is sufficient.

5.0.3 *5.3 The Synthesis*

The knowledge-skills debate resolves, in light of the evidence, into something like this: *Knowledge is the foundation of skilled thinking. Skills are the application of knowledge in context. Neither exists*

independently. Curriculum must develop both, not as separate tracks but as integrated aspects of genuine understanding.

Willingham gets this right: students need knowledge because knowledge is what thinking operates on. Hirsch gets this right: shared cultural knowledge enables communication, reading comprehension, and democratic participation. The skills movement gets this right: knowing facts is not enough — students need to learn to *do* things with what they know. The resolution is not a compromise but a genuine synthesis: deep knowledge, developed through meaningful engagement with disciplinary content, practiced in varied contexts that develop transferable understanding.

This aligns with Bildung's insistence that self-formation occurs through meaningful encounter with substantive content, and with Nussbaum's specification that the senses, imagination, and thought must be "informed and cultivated by an adequate education." It also aligns with Freire's rejection of the banking concept: knowledge should not be deposited but actively constructed through engagement with real problems. The content matters, but how students engage with it matters equally.

---

6 WHAT THE FRAMEWORKS CONVERGE ON

This is the most important section of this dissertation. Across philosophy, empirical research, curriculum theory, cross-cultural evidence, and practitioner experience — what keeps coming up? What seems genuinely robust?

6.0.1 *6.1 Self-Regulation and Executive Function*

Every tradition points to this in some form. The Dunedin study's self-control gradient. Heckman's non-cognitive skills. Nussbaum's practical reason. Dewey's intelligent activity directed by foresight. Freire's capacity for critical reflection before action. The Bildung tradition's self-formation. Even the labor market data: Deming's social skills require the self-regulation to manage one's impulses in social situations.

A person who cannot manage their attention, defer gratification, persist through difficulty, and regulate their emotional responses is profoundly limited in every other capacity. Self-regulation is the meta-capability that enables all others. The evidence for its importance is as strong as anything in the social sciences.

6.0.2 *6.2 The Capacity for Relationship*

Nussbaum's Affiliation. Ubuntu's relational personhood. The Grant Study's "happiness is love." Deming's social skills. Freire's dialogue. Dewey's social interdependence. The capacity to form and maintain relationships — to empathize, cooperate, negotiate, resolve conflicts, care for others, and be cared for in return — is not peripheral to human flourishing but central to it.

This is perhaps the domain where education is most deficient. Schools develop cognitive capabilities systematically (through academic instruction) but develop relational capabilities mostly incidentally (through the peer environment, extracurricular activities, or the quality of teacher-student relationships). The evidence suggests this is a significant misallocation of educational attention.

6.0.3 *6.3 Deep Knowledge in Multiple Domains*

Willingham, Hirsch, Young, the Bildung tradition, and Nussbaum all converge on this: 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 kind of flexible, transferable thinking that "critical thinking" frameworks aspire to requires deep knowledge within specific domains. A curriculum that covers many topics superficially may be less effective than one that goes deep in fewer domains.

However, the evidence also suggests that breadth has value for a different reason: it enables analogical reasoning across domains. The most creative and innovative thinkers tend to have knowledge in multiple, diverse domains (what the polymath literature calls "range"). This suggests

that the optimal curriculum provides deep knowledge in at least two or three unrelated domains, combined with enough breadth to enable cross-domain connections.

6.0.4 *6.4 Critical Consciousness and Epistemic Agency*

Freire's conscientization. Dewey's intelligent activity. Nussbaum's practical reason. Klafki's engagement with epoch-typical key problems. All of these describe some version of the same capability: the ability to perceive one's situation accurately, to understand the forces that shape it, and to act thoughtfully in response. This is not "critical thinking" in the generic, transferable-skill sense that competency frameworks use the term. 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.

This capability requires knowledge (you cannot critically analyze what you do not understand) and disposition (the habit of questioning rather than accepting). It also requires what might be called epistemic courage — the willingness to examine uncomfortable truths about one's own situation and the world.

6.0.5 *6.5 Physical Competence and Health Literacy*

Nussbaum's capabilities of Life, Bodily Health, and Bodily Integrity. The Dunedin study's health outcomes. Practitioner communities' emphasis on nutrition, exercise, and self-care. The evidence consistently shows that physical health and the knowledge to maintain it are essential components of adult competence that education often neglects or outsources to PE classes.

Health literacy — understanding how the body works, how to maintain it, how to navigate the healthcare system, how to evaluate health claims — is a specific domain of knowledge with enormous practical importance. Financial literacy is similar: understanding compound interest, tax optimization, insurance, and investment fundamentals is knowledge that most adults report needing and most schools fail to teach (Lusardi, 2019; Lusardi & Mitchell, 2011).

6.0.6 *6.6 Practical Competence*

The homeschooling community's emphasis on cooking, maintenance, and bureaucratic navigation points to a category of competence that academic education systematically ignores: the practical skills of daily adult life. The ability to cook nutritious food, maintain a household, manage personal finances, navigate legal and bureaucratic systems, and handle basic tools and technology are all necessary for adult independence. Their absence in conventional curricula is conspicuous and reflects a longstanding bias toward academic knowledge over practical competence — the division that Dewey critiqued in his chapters on vocational education and the separation of "intellectual" from "practical" studies.

6.0.7 *6.7 The Convergence Map*

Synthesizing across all sources, the following capabilities emerge as having the strongest cross-tradition support:

1. **Self-regulation and executive function** — the meta-capability. (Moffitt, Heckman, Nussbaum, Dewey, Freire)

2. **Relational capability** — the capacity for empathy, cooperation, and sustained relationship. (Grant Study, Deming, Nussbaum, Ubuntu, Freire)
3. **Deep knowledge in substantive domains** — including literacy, numeracy, scientific understanding, and historical/civic knowledge. (Willingham, Hirsch, Young, Nussbaum, Bildung)
4. **Critical consciousness / epistemic agency** — the capacity to read the world and act on that understanding. (Freire, Dewey, Nussbaum, Klafki)
5. **Practical competence** — financial literacy, health literacy, domestic skills, bureaucratic navigation. (Lusardi, practitioner evidence, Nussbaum)
6. **Aesthetic and creative capability** — the capacity for imaginative and artistic engagement. (Nussbaum, Bildung, Dewey)
7. **Physical competence** — health, bodily capability, and the knowledge to maintain them. (Nussbaum, longitudinal health evidence)
8. **The disposition to continue learning** — growth, self-formation, becoming. (Dewey, Bildung, Freire, Nussbaum)

This list 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, and design learning experiences — using tools like Wiggins and McTighe's backward design and Schwab's deliberation.

7

WHAT REMAINS GENUINELY CONTESTED

7.0.1 *7.1 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 the specific content to teachers and communities? This is the deepest disagreement among the traditions surveyed. Nussbaum and Hirsch favor more specification; Dewey and Freire favor less. Schwab's deliberation model suggests the answer depends on context. This is not resolvable by evidence — it is a values question about the relationship between freedom and structure in education.

7.0.2 *7.2 The Balance Between Individual and Community*

Western frameworks (Nussbaum, Dewey) treat the individual as the primary unit of educational concern, even when they acknowledge social interdependence. Ubuntu challenges this directly. How much weight should a curriculum give to individual development versus communal capacity? In practice, this question intersects with cultural context: education in individualistic societies will emphasize different aspects of competence than education in collectivist societies. Whether there is a universal answer or whether this is irreducibly contextual is an open question.

7.0.3 *7.3 Whose Flourishing Counts?*

Freire insists that the question "what should be learned?" cannot be separated from the question "who decides?" and "whose interests are served?" If curriculum choices are made by institutions embedded in structures of economic and political power, the resulting curricula will tend to serve those structures — producing compliant workers rather than critical citizens. This critique is not dismissable, but its practical implications are contested. A radical Freirean might argue that any centralized curriculum is inherently domesticating; a liberal capability theorist would argue that centralized curricula can be designed to develop critical capacity. The disagreement is real and significant.

7.0.4 *7.4 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. This leads directly to the AI question.

Part IV

THE FUTURE

8

THE AI TRANSITION

8.0.1 *8.1 What We Know*

The routine-biased technological change framework (Autor, Levy, & Murnane, 2001; Acemoglu & Autor, 2010) provides the best empirical foundation for thinking about AI's impact on what should be learned. The framework distinguishes between routine tasks (which follow explicit rules and are readily automated) and non-routine tasks (which require judgment, flexibility, or physical dexterity).

Previous waves of automation displaced routine manual tasks (manufacturing) and routine cognitive tasks (bookkeeping, data entry). The evidence shows that the labor market has polarized: employment growth at the top (non-routine analytical and interpersonal) and bottom (non-routine manual) with hollowing in the middle (routine tasks).

The current AI wave potentially extends automation to some non-routine cognitive tasks — writing, summarizing, coding, analyzing, and even some forms of judgment. If this trend continues, the premium on uniquely human capabilities — interpersonal connection, ethical judgment, creative synthesis, physical skill, care work — may increase further.

8.0.2 *8.2 What We Can Reasonably Infer*

Several inferences seem well-supported:

Factual recall becomes less important relative to judgment. If AI can instantly retrieve and synthesize information, the educational premium shifts from knowing facts to knowing what to do with facts — how to evaluate sources, frame questions, synthesize across domains, and exercise judgment. This does *not* mean knowledge becomes unimportant (you still need knowledge to evaluate what AI produces), but the balance shifts.

Social and interpersonal capabilities become more valuable. If AI handles routine cognitive tasks, the remaining human work is increasingly interpersonal — caregiving, teaching, managing, collaborating, negotiating, leading. Deming's (2017) findings about the growing importance of social skills are likely to accelerate.

The capacity to work with AI becomes essential. The ability to effectively prompt, evaluate, and direct AI systems is likely to become a basic literacy requirement, analogous to the ability to use search engines or word processors today.

Meta-cognitive and self-regulatory capabilities matter more. In a world of abundant information and powerful tools, the ability to manage one's own learning, evaluate one's own understanding, and direct one's own development becomes critical. Dewey's "continued capacity for growth" has never been more relevant.

8.0.3 *8.3 What We Cannot Yet Know*

We must be honest about the limits of our foresight:

We do not know how far AI automation will extend. Whether current AI systems represent a plateau or a step toward more general capability is genuinely uncertain. The implications for education differ dramatically depending on which scenario obtains.

We do not know which specific knowledge domains will be most affected. The assumption that "STEM is safe" is not supported by current evidence — AI is already more capable at coding and data analysis than at nursing or plumbing.

Historical analogies are imperfect. The printing press changed what people needed to memorize; the calculator changed what mathematical skills were needed; the internet changed what information was worth internalizing. But the AI transition may be qualitatively different — not merely changing what information is worth memorizing but potentially changing what cognitive tasks humans perform at all.

8.0.4 *8.4 Implications for Curriculum*

The AI transition strengthens several of the convergences already identified:

- Self-regulation becomes more important, not less — managing attention in a world of infinite distraction and AI-generated content requires more executive function, not less.
- Social and relational capabilities become more important as routine cognitive work is automated.
- Deep domain knowledge remains important *because* it is what enables evaluation of AI output — but the emphasis may shift from breadth of factual knowledge toward depth of understanding in selected domains.
- Critical consciousness (Freire) becomes urgent: the ability to discern AI-generated misinformation, to understand how AI systems work and whose interests they serve, and to participate in democratic governance of AI are essential capabilities for the AI era.
- Practical competence — physical skills, caregiving, manual capability — may increase in relative value as cognitive automation advances.

What the AI transition does *not* change is the philosophical foundation. The capabilities approach, Dewey's growth, Freire's liberation, Bildung's self-formation — these are about what it means to be a fully developed human being, and that question is not altered by the tools available. A person still needs self-regulation, relational capability, knowledge, agency, and practical competence — perhaps more than ever, because the environment demands more judgment and less routine.

9 CLOSING ASSESSMENT

9.0.1 *9.1 What a Curriculum Designer Can Confidently Build On*

A curriculum designer at Applied Pedagogy can build on the following with reasonable confidence:

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 on their own has failed.

Self-regulation and executive function should be systematically developed, not assumed. The longitudinal evidence is as strong as anything in the social sciences. Education should explicitly develop the capacity to manage attention, regulate emotions, persist through difficulty, and defer gratification.

Both knowledge and the capacity to use it are essential. The knowledge-skills dichotomy is false. Curriculum should develop deep knowledge in substantive domains *and* the ability to apply, transfer, and build on that knowledge. Neither content-free skills training nor rote knowledge transmission is adequate.

Social and relational capabilities deserve as much curricular attention as academic capabilities. The evidence from the Grant Study, Deming's labor market analysis, and multiple philosophical traditions indicates that relational capability is central to flourishing and increasingly important in the economy.

Practical life competence — financial literacy, health literacy, domestic skills — should not be left to chance. The evidence from Lusardi and from practitioner communities indicates that these domains of knowledge are essential for adult functioning and are currently undertaught.

The curriculum should develop critical consciousness — the capacity to read the world and act on it. In an era of AI-generated content, algorithmic manipulation, and rapid social change, the ability to perceive reality accurately, evaluate information critically, and act thoughtfully is not a luxury but a necessity.

9.0.2 *9.2 What Remains for the PI to Decide*

Several choices cannot be resolved by research and require value judgments:

How much curricular prescription is appropriate? Should the curriculum specify content that all students must learn (Hirsch/Nussbaum), or should it specify capabilities and let content vary (Dewey/Freire)? The PI must make a judgment about where on this spectrum Applied Pedagogy's curriculum should sit.

What balance between individual development and communal responsibility? The Western emphasis on individual autonomy and the Ubuntu/communitarian emphasis on relational belonging point in somewhat different directions. The PI must decide how much weight to give each.

How to handle cultural specificity? Some knowledge is culturally specific (the particular literature, history, and traditions of a community). How much of the curriculum should be universal

and how much culturally situated? This is particularly relevant for a project that aspires to serve diverse communities.

How to sequence development. The convergence map tells us *what* to develop, but the question of *when* — what capacities should be developed at what ages, and in what sequence — requires both developmental science (which other L1 agents are surveying) and practical judgment.

How radically to depart from conventional schooling. Freire and Dewey both 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.

9.0.3 *9.3 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 answered. This investigation has assembled the best available materials for answering it: philosophical frameworks for thinking about human flourishing, empirical evidence on what predicts good outcomes, curriculum theory for translating aims into practice, and an honest assessment of the AI transition's likely effects.

The materials point toward something like this: A well-educated 18-year-old should have deep knowledge in several domains, the capacity for self-regulation and continued learning, strong relational and social capabilities, practical competence in managing their own life (health, finances, domestic skills), and the critical consciousness to navigate a world of AI-mediated information and rapid change. They should be, in Nussbaum's terms, someone who has reached a threshold of capability across all the dimensions of a dignified human life. They should be, in Dewey's terms, someone whose capacity for growth has been not just preserved but strengthened. They should be, in Freire's terms, someone who can read the world and act on it.

This is not a curriculum. It is the beginning of one. The work of translating these aims into specific learning experiences, content selections, and assessment approaches — the work of curriculum design proper — lies ahead. But it begins from a foundation that is philosophically grounded, empirically informed, cross-culturally tested, and honest about its own limitations. That is the best any investigation can provide.

BIBLIOGRAPHY

Acemoglu, D., & Autor, D. (2010). Skills, tasks and technologies: Implications for employment and earnings. *NBER Working Paper* 16082.

Ananiadou, K., & Claro, M. (2009). 21st century skills and competences for new millennium learners in OECD countries. *OECD Education Working Papers*, No. 41.

Autor, D. H., Levy, F., & Murnane, R. J. (2001). The skill content of recent technological change: An empirical exploration. *NBER Working Paper* 8337.

Chen, L., Chen, P., & Lin, Z. (2020). Artificial intelligence in education: A review. *IEEE Access*, 8, 75264–75278.

Cunha, F., Heckman, J. J., Lochner, L., & Masterov, D. V. (2005). Interpreting the evidence on life cycle skill formation. *NBER Working Paper* 11331.

Deming, D. (2017). The growing importance of social skills in the labor market. *Quarterly Journal of Economics*, 132(4), 1593–1640.

Dewey, J. (1916). *Democracy and Education: An Introduction to the Philosophy of Education*. Macmillan.

Freire, P. (1970). *Pedagogy of the Oppressed* (M. B. Ramos, Trans.). Continuum.

Gordon, J., et al. (2009). Key competences in Europe: Opening doors for lifelong learners across the school curriculum and teacher education. *SSRN Electronic Journal*.

Gray, P. (2013). *Free to Learn: Why Unleashing the Instinct to Play Will Make Our Children Happier, More Self-Reliant, and Better Students for Life*. Basic Books.

Hirsch, E. D. (1987). *Cultural Literacy: What Every American Needs to Know*. Houghton Mifflin.

Horlacher, R. (2016). The educated subject and the German concept of Bildung. *Comparative Education*, 52(1).

Jeste, D. V., et al. (2010). Expert consensus on characteristics of wisdom: A Delphi method study. *The Gerontologist*, 50(5), 668–680.

Klafki, W. (1995). Didactic analysis as the core of preparation of instruction. *Journal of Curriculum Studies*, 27(1), 13–30.

Kohn, A. (1993). *Punished by Rewards: The Trouble with Gold Stars, Incentive Plans, A's, Praise, and Other Bribes*. Houghton Mifflin.

Letseka, M. (2012). In defence of Ubuntu. *Studies in Philosophy and Education*, 31(1).

Lusardi, A. (2019). Financial literacy and the need for financial education: Evidence and implications. *Swiss Journal of Economics and Statistics*, 155(1).

Lusardi, A., & Mitchell, O. S. (2011). Financial literacy and planning: Implications for retirement wellbeing. *NBER Working Paper* 17078.

Moffitt, T. E., et al. (2011). A gradient of childhood self-control predicts health, wealth, and public safety. *Proceedings of the National Academy of Sciences*, 108(7), 2693–2698.

Ngubane, N. I., & Makua, M. (2021). Ubuntu pedagogy — Transforming educational practices in the midst of Covid-19. *Research in Social Sciences and Technology*, 6(2).

Nussbaum, M. C. (2011). *Creating Capabilities: The Human Development Approach*. Harvard University Press.

Robeyns, I. (2017). *Wellbeing, Freedom and Social Justice: The Capability Approach Re-examined*. Open Book Publishers.

Schwab, J. J. (1969). The practical: A language for curriculum. *School Review*, 78(1), 1–23.

Schweinhart, L. J., et al. (2005). *Lifetime Effects: The High/Scope Perry Preschool Study Through Age 40*. High/Scope Press.

Sen, A. (1999). *Development as Freedom*. Oxford University Press.

Sjöström, J., & Eilks, I. (2018). Reconsidering different visions of scientific literacy and science education based on the concept of Bildung. In Y. J. Dori et al. (Eds.), *Cognition, Metacognition, and Culture in STEM Education*. Springer.

Stenhouse, L. (1975). *An Introduction to Curriculum Research and Development*. Heinemann.

Tyler, R. W. (1949). *Basic Principles of Curriculum and Instruction*. University of Chicago Press.

Vaillant, G. E. (2012). *Triumphs of Experience: The Men of the Harvard Grant Study*. Belknap Press.

Wiggins, G., & McTighe, J. (2005). *Understanding by Design* (2nd ed.). ASCD.

Willingham, D. T. (2009). *Why Don't Students Like School? A Cognitive Scientist Answers Questions About How the Mind Works and What It Means for the Classroom*. Jossey-Bass.

Young, M. F. D. (2008). *Bringing Knowledge Back In: From Social Constructivism to Social Realism in the Sociology of Education*. Routledge.