

Deviant by Design: Forging Educational Systems for Path-Diverse Learners

A systems-level analytical framework of educational design that centers human variability, development, and equity while interrogating the myth of the “ideal learner.”

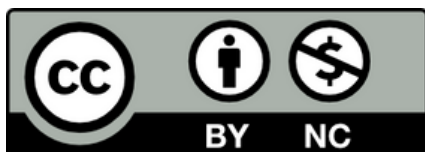
An Academizine by Ruth S. Xing

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Author's Note

in this zine, I build upon scholarship spanning education, psychology, sociology, and adjacent fields while introducing several original concepts, terms, and frameworks. **These contributions include, but are not limited to, the following:**

- systems architecture as a distinct conceptualization in education;
- path-diverse learning (or trajectory-diverse learning) and its spectrum;
- the “ideal learner” profile, including defining characteristics and dimensions;
- learner dimensions related to educational system design;
- linear and nonlinear learning tendencies as related to developmental chronology, pacing, and sequencing;
- temporal (time) deviance in formal learning systems;
- a reconceptualization of educational perseverance (“grit”) that integrates safety and equity while accounting for allocation and reallocation of effort and resources across domains;
- path-diverse educational design as a reflective, adaptive system;
- other considerations of learner variability, development, and systemic design that are currently underexplored and - examined in dominant educational models and frameworks.

Together, these conceptual contributions intend to describe the forms, expressions, and conditions of human developmental variability that current dominant theories and frames insufficiently address. They also provide a shared language and conceptual foundation for engaging with system-level educational design—including principles, structures, and evaluation—as well as learner-level development, characteristics, and experiences.

Introduction

Educational systems must center humanity in their designs by supporting human variability, developmental plasticity, and equity rather than idealized notions of uniformity or conformity to normalized expectations (Rose, 2016). However, systems often treat human variability as a complicating deviation in design rather than a foundational reality (Davis, 1995). As a result, educational systems ideologically and structurally equate effective design and learner growth with conformity to narrowly defined standards, norms, and ideals, including limited definitions of “success” and “progress”—a phenomenon that can be understood through theories of normalization, cultural reproduction, and disciplinary power (Bourdieu & Passeron, 1970/1977; Foucault, 1975/1977).

At their core, these systems are built to serve a **mythological “ideal learner,”** which functions as a normative organizing ‘reference point’ upon which governing structures, design principles, and operating mechanisms are based—and against which all students are compared and measured. This ideal profile is neither wholly achievable nor representative of how humans actually learn, grow, and develop; rather, it represents a simplified, catch-all principle that drives central priorities of fostering administrative convenience, achieving economic and industrial goals, and maintaining dominant-culture norms, which shape how systems conceptualize and measure success, progress, and development in the first place (Bowles & Gintis, 1976; Callahan, 1964; Labaree, 2012). Principles and mechanisms therefore tend to be self-reinforcing without intentional, structured intervention.

Every learner can be understood to be **“path-diverse,”** with each learner’s development and learning trajectory shaped by distinctive characteristics, pacing, directions, and indicators of growth. Individuals arrive at their own versions of developmental progress through different pathways and timelines, forged by interacting contexts, circumstances, and learner tendencies and behaviors, as supported by theories of ecological development (Bronfenbrenner, 1979). Educational systems must therefore design structures that intentionally recognize and support this broad range of variability, complexity, and plasticity for all learners.

Difference among learners is not deviance but variance (Davis, 1995; Rose, 2016). Yet educational systems continue to treat divergence from the “ideal learner” profile and its prescribed timelines as failure, deficiency, or, in the latter case, “lateness.” The very language we use—for example, describing learners as “late bloomers” when their development differs from system-normative chronology or pacing—reveals how deeply standards of conformity, timeliness, and adherence to prescribed pathways have become entrenched as indicators of progress, achievement, and even worth.

The goal in designing educational systems should not be to abolish existing systems as they stand, but to redesign and revise them iteratively with responsive and adaptable structures, policies, and governing principles. These structures, policies, and principles must center humanity in its variability, complexity, and plasticity, as well as attend to inherent human needs for safety and understanding. Designing intentional structures under these guiding realities produces more equitable, responsive, and effective systems that better support the full spectrum of learners and developmental trajectories. Ultimately, educational design centered on human variability is both essential and achievable, and it benefits all stakeholders involved.

Systems Architecture and the Harms of the Mythological “Ideal Learner”

By “**systems architecture**,” I refer to the overarching design, structures, and governing principles that shape how a given educational system (i.e., formal schooling) operates. This includes how systems structure learning and opportunity, define success and progress, assess individuals, privilege or reward certain groups and individuals, and marginalize or punish others.

Educational systems have historically been designed and implemented around a mythological “ideal learner,” drawing from broader theories of normalization, normativity, and cultural reproduction via valued forms of capital (Bourdieu, 1983/1986; Foucault, 1975/1977). This governing principle and its associated mechanisms are driven by a complex combination of priorities and goals that shape how systemic structures are constructed, organized, and executed. These priorities and goals are as follows:

- administrative efficiency;
- industrial control and productivity, including economic and labor-force optimization;
- minimization of liability, including justifiable claims of “fairness” and objectivity through standardization;
- social control, particularly the maintenance of dominant norms, narratives, and epistemologies (Bowles & Gintis, 1976; Callahan, 1964; Labaree, 2012).

As a result, systems architecture prioritizes institutional stability and self-protection over human variability and responsiveness therein. Educational systems design is not necessarily undertaken with intentional cruelty or harm; however, from a practical standpoint, its design and execution are biased, reductive, error-prone, and slow to change, thereby creating and reinforcing extensive harm and inequities (Apple, 1979; Tyack & Cuban, 1995).

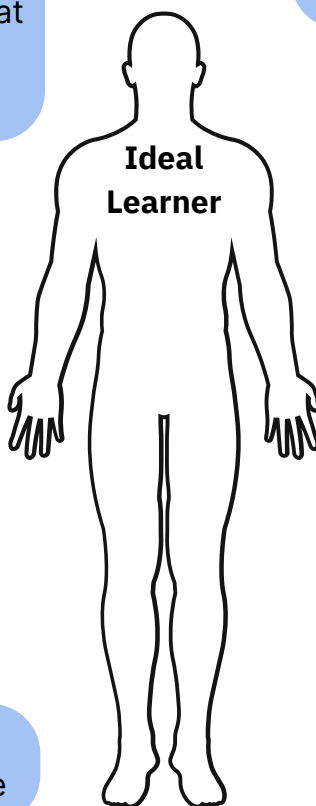
Over time, the imaginary “ideal learner” has become the touchstone and operating assumption around which systemic structures are designed, implemented, and evaluated. The profile of this “ideal learner” is shaped by an institutionally-valued combination of dimensional characteristics and behavioral patterns, illustrated in the diagram that follows (the corresponding caption appears below).

Figure 1. Profile of the “Ideal Learner”: Dimensions and Characteristics.

This original analytical framework builds upon scholarship on normalization and normativity, cultural reproduction, chrononormativity, disability, and equity, particularly as these phenomena emerge as assumptions in educational systems design (e.g., Pierre Bourdieu; Lennard J. Davis; Michel Foucault; Elizabeth Freeman).

Figure 1. Profile of the “Ideal Learner”: Dimensions and Characteristics

Systems are designed for an “ideal learner.”



developmentally
chrononormative
(progresses through
standard milestones at
the “right time” and
“right pace”)

developmentally
linear (progresses
through standard
milestones in the
“right order”)

dominant culture-
aligned (racially,
linguistically,
epistemically,
etc.)

socioeconomically
and resource-secure

structurally and safety-secure
(e.g., comes from a stable
environment, has minimal
trauma or adverse
experiences, aligns with
dominant norms [racial,
gender, sexual, etc.]

motivationally
normative (e.g.,
internally motivated
toward education)

behaviorally
normative (e.g.,
follows rules and
expected conduct)

affectively
normative and
regulated (e.g.,
presents as
emotionally
“contained” in a
socially
acceptable way

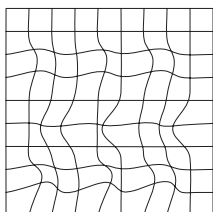
neurotypical
(normative executive
and cognitive
functioning and self-
regulation)

physically normative and
able-bodied (e.g., does not
have mobility issues,
sensory issues, or chronic
health conditions)

It is completely valid and acceptable for a learner to exhibit any of the above characteristics, whether alone or in combination. In fact, most learners do display at least one of these naturally at any given time, and harm does not arise at the level of individual difference. Many of these characteristics are also plastic and represent a learner’s state at a given point or period in their trajectory, subject to change depending on context and circumstance (e.g., being safety-secure).

The problem, however, arises at the systemic and institutional levels. When educational systems are designed to privilege and reward certain characteristics—“ideal learner” characteristics—over others, they elevate these traits into a governing ideal and normalized expectation that becomes an unrealistic standard against which all learners are compared and measured. This standard is simultaneously prescriptive and unattainable while persisting over time.

This process produces and reinforces a hierarchical power structure that disadvantages learners who tend to diverge across these different dimensions. Oftentimes, these hierarchies operate through oversimplified, dichotomous outcomes—reward or punish, privilege or marginalize, include or exclude—based on a learner’s perceived alignment or misalignment with the idealized norm, which is itself subject to misinterpretation.



Ultimately, this patterned issue represents a systemic design failure—not a failure of individual learners.

Equity inherently requires structural considerations of variability and divergence; uniformity and strict ideals do not represent equity but convenience, control, and a domination of normalized narratives.

The “Ideal Learner” as a Global Entrenchment in Systems Design

Across the world, the mythological “ideal learner” functions as an organizing principle that governs the design of educational systems, reflecting the phenomenon of global convergence described by world society theory (Meyer et al., 1997). The “ideal learner” is structurally ingrained in systems architecture, national policy, institutional features, and assessment schemes, shaping how success, ability, and developmental growth are defined and measured. These structures notably privilege and reward certain developmental pathways, learner tendencies, and behaviors, while marginalizing and punishing others.

Though educational systems differ in their exact form, history, and objectives, idealized learner norms pervasively influence design across diverse national systems and contexts, where they significantly shape learner opportunity and outcomes. Because many systems operate on similar or overlapping assumptions about learning and development, they often adopt similar design mechanisms through convergence, modeling, or adaptation.

For example, one commonly recurring mechanism is **tracking**—the practice of categorizing or grouping learners based on perceived ability, performance, or goals—which represents a key operationalization of the “ideal learner” construct (Oakes, 2005). Though often justified as a way to support learners through differentiation and “better-aligned” instruction, tracking often functions as a tool of stratification and is highly prone to misclassifying and -understanding learners (Gamoran, 1992; Oakes, 2005). This in turn limits learners’ educational pathways and opportunities while disproportionately harming marginalized students.

The national educational systems described in the following section serve as examples of commonly recurring design principles, assumptions, and touchstones, particularly surrounding chronology and pacing, learner categorization, and systemic expectations.

Comparing Education Systems: US and Germany

Comparing educational systems can reveal differing structures, design principles, and mechanisms through which learners are supported, constrained, or steered along certain developmental and educational paths. The US and German education systems, for example, reflect differing design principles and assumptions about developmental timing, pacing, sequencing, and learner categorization. Broadly speaking, the US system operates via a ‘pipeline’ model that prioritizes linear progression along a dominant pathway, whereas the German system operates via an ‘early branching’ model that formalizes categorization into separate educational tracks (European Education and Culture Executive Agency [EECEA], 2025; Organisation for Economic Co-operation and Development [OECD], 2025).

The US system emphasizes standardized testing, time-bound milestones, and consistent “on-time” learner pacing, which structurally disadvantage learners who experience development in different rhythms, face disruptive circumstances, or demonstrate understanding via other ways of knowing. Though divergence from expected timelines may be addressed through structures like remediation, sequential progression and returns to education are still constrained by credential requirements and time-based expectations (OECD, 2025).

On the other hand, the German system tracks learners early into different pathways (e.g., *Hauptschule*, *Realschule*, or *Gymnasium*), privileging those who demonstrate institutionally-affirmed indicators of “readiness” within a narrow timeframe. While learner differences are identified and acted upon earlier, tracking is often rigid and difficult to change, structurally disadvantaging learners who reach individual readiness later or experience changing trajectories (EECEA, 2025).

Despite their structural differences, neither system effectively prepares for or supports path-diverse learning. Both systems design for dominant timelines, rigid sequential progressions, and limited opportunities for redirection or re-engagement. The core challenge then is how systems design for, rather than against, human variability and development through their governing principles and structures.

Recurring Design Ideologies Across Educational Systems and Contexts

So far, we've examined the defining characteristics of the "ideal learner," traced its global entrenchment across diverse national educational systems, and explored the governing principles and priorities that shape systems design. From these influences, we observe that many educational systems exhibit recurring design ideologies, including the following:

1) Value the appearance of minimal learner needs.

Systems privilege and reward learners who appear to have fewer salient needs and align more closely with the characteristics of the "ideal learner," whether or not such appearances reflect reality. This conditions learners to mask, suppress, and even fail to recognize, understand, or communicate their needs.

2) Treat learner variability and divergence from normalized ideals as deficient.

By designing around a narrow ideal, systems reinforce the assumption that learners who do not align with the characteristics and conditions of this ideal are the problem. Learners are thereby labeled "struggling," "behind," "not ready," "disengaged," "unmotivated," or a myriad of other terms implying that the individual learner rather than the system is the problem. Under this model, learners are therefore rendered **deviant by design**, where they are both harmed and held back from reaching their full potential by structures that were not adequately designed to recognize or support their variability.

3) Privilege and reward learner conformity and uniformity while devaluing and punishing differences.

Educational systems define, normalize, and perpetuate narrow conceptualizations of “success” and “progress” based on institutionally-defined priorities and ideals. In this vein, they reward and reinforce alignment with dominant cultures, norms, and epistemologies while structurally punishing learners with developmental trajectories, modes of engagement and expression, and ways of knowing that diverge from expectations. In doing so, systems devalue learner understanding, learner potential, and the validity of diverse developmental pathways.

4) Oversimplify human variability and complexity to convenient measurements and structures.

Systems are designed by reducing complexity into more conveniently measured, ranked, and standardized structures, which causes harm by producing and perpetuating oversimplistic categorization, hierarchy, and binary thinking (e.g., treating students as “talented” versus “not talented”). Such structures place immense pressure not just on students, but also on the myriad educators, assessors, and educational personnel involved in these processes, particularly those who hold less structural power and are subject to strict standards themselves.

5) Overburden and undersupport educators with compensatory labor within rigid structures.

Gaps created by suboptimal systemic structures require educators to take on the extensive labor—instructional, emotional, bureaucratic, and otherwise—of affording flexibility and adaptability to learners within rigid systems. This reliance on informal, discretionary support creates both burnout for educators and inconsistencies in how learners are supported. Redesigning educational systems is essential to effectively support not just learners, but also the educators who carry the immense and often invisible labor of making adjustments.

Designing for Path-Diverse Learners Benefits All Stakeholders

Ultimately, the harms that learners, educators, and stakeholders experience under the above structures and ideologies are failures of systemic and institutional design rather than of individuals. Redesigning educational systems benefits all stakeholders involved.

The mechanisms described above represent both equity issues and broader performance failures of flawed systemic structures. Systems built on narrow ideals and rigid structures not only exclude certain learners, but they are also fragile and function poorly as a whole, where their fragility becomes especially salient during periods of change, transition, and challenge.

To this point, systems designed for uniformity struggle to adapt to nuance and complexity, as they often rely on oversimplistic categorization to manage variability and diversity rather than to celebrate and respond to it. These resultant failures and frictions negatively impact all stakeholders involved, even learners who are more proximal to the “ideal learner” profile and institutional norms.

Learners who align more closely with the “ideal learner” are not necessarily supported effectively. They, too, are constrained by limitations, including pathway constraints, narrow definitions of success, and a pressure to conform and comply rather than to understand, take risks, and explore. Furthermore, since learners are not static, any learner could diverge from the “ideal learner” profile at any given point or period—no one is fully insulated from potential structural harm. Ultimately, educational systems reward short-term performance indicators while, in the long run, inhibiting full curiosity, adaptability, understanding, and engagement.

Educators are left to absorb a disproportionate portion of these structural limitations and burdens as compensatory labor. Because flexibility, adaptability, and individualization are not structurally built into the system, the work therein is passed down to teachers, advisors, and other educational professionals. This labor comes in many forms—instructional, emotional, and otherwise—and is often invisible, informal, and unavoidable. Over time, this creates exhaustion and burnout for educators, reduces educator bandwidth, and produces inequitable outcomes across learners, regardless of how much effort educators put in.

Institutions are likewise affected in this process. Systems that reduce human variability to narrow metrics and standardization inevitably misinterpret and underestimate ability, overlook potential, and make crucial decisions based on incomplete or unrepresentative information. Over time, this structure continues to pass on as “good enough” while failing to self-evaluate or self-correct, which produces consequences such as inflated remediation rates, or reduced trust in systems among learners, families, and educators alike.

Designing educational systems centered on human variability, development, and plasticity forges structures that are more resilient, equitable, and effective. Such systems also ameliorate issues of learner misunderstanding and miscategorization while improving equity in professional labor and supporting the myriad ways in which learning and development actually occur. Ultimately, designing systems for path-diverse learners supports all stakeholders in education more effectively and equitably.

Design Harms Across Learner Dimensions and Trajectories

Educational systems designed around the “ideal learner” produce systemic harms that recur in patterned and predictable ways across diverse contexts. When systems normalize and reinforce rigid expectations aligned with this ideal, learners whose tendencies, behaviors, and developmental trajectories differ from these expectations experience cumulative harm. These harms are structural and longitudinal consequences of system design, including principles and institutional features that privilege and reward a specific and narrow learner profile.

The harms below reflect recurring forms of negative impact that learners experience as a result of system design, conceptualized across the dimensions and characteristics of the “ideal learner” (see *Figure 1. Profile of the “Ideal Learner”: Dimensions & Characteristics*). Each form of harm reflects the cumulative pressure generated over time by narrow design principles, structures, and normalized expectations within systems architecture. For each dimension of harm, key contributing characteristics of the “ideal learner” are listed in parentheses for reference; however, multiple characteristics and dimensions often contribute, interact, and create compounded effects.

Design Harms Across Learner Dimensions and Trajectories

These harms originate in system-level design, operate through institution-level structures, and engender individual-level harms and experiences.

1. **Temporal harm** (“developmentally chrononormative,” “developmentally linear”)
2. **Developmental harm** (“developmentally chrononormative,” “developmentally linear”)

3. **Cognitive harm** (“neurotypical,” “motivationally normative”)
4. **Affective harm** (“affectively normative and regulated,” “behaviorally normative”)
5. **Social and relational harm** (“dominant culture-aligned,” “behaviorally normative,” “structurally and safety-secure”)
6. **Epistemic harm** (“dominant culture-aligned”)
7. **Physical and somatic harm** (“physically normative and able-bodied,” “structurally and safety-secure,” “affectively normative and regulated”)
8. **Equity harm** (“dominant culture-aligned,” “socioeconomically and resource-secure,” “structurally and safety-secure,” “developmentally chrononormative”)
9. **Identity and narrative harm** (whole “ideal learner” profile)
10. **Creativity harm** (whole “ideal learner” profile; converges from cognitive, affective, and epistemic harms)

The section below explores examples of these harms to demonstrate how learners experience the effects of narrow design across different dimensions and trajectories. While these harms represent unique frames of analysis, they are each deeply interconnected in how they arise and impact learners. Note that many harms converge, interact, and compound across dimensions, particularly through interactions among multiple “ideal learner” characteristics.

Examples of Design Harms Across Learner Dimensions and Trajectories

1) Temporal harm (“developmentally chrononormative,” “developmentally linear”)

Fear of being “late” or falling behind; anxiety surrounding deadlines, benchmarks, and time-bound milestones; chronic stress and pressure from following normalized timelines; negative self-concept of being consistently “slow,” “behind,” or “delayed”; lost developmental time spent recovering from harm or meeting rigid expectations (e.g., remediation, therapy).

2) Developmental harm (“developmentally chrononormative,” “developmentally linear”)

Anxiety and exhaustion from expectations around pace and sequence; limiting labeling and categorization of learners; maladaptive behavioral compensation for nonlinear learning tendencies; reduced possibilities for future developmental paths, identity formation, and self-exploration due to rigid expectations and requirements.

3) Cognitive harm (“neurotypical,” “motivationally normative,” “behaviorally normative”)

Shallower understanding and engagement; normalization of reduced cognitive depth due to prioritizing compliance and “getting by”; reduced cognitive energy for learning and meaning-making to prioritize survival, safety, or task completion; reduced intrinsic motivation.

4) Affective harm (“affectively normative and regulated,” “behaviorally normative”)

Feelings of shame, guilt, or anger; emotional suppression; reduced ability to learn emotional skills and regulation; chronic anxiety and stress surrounding learning; hypervigilance due to unmet needs and perceived lack of support, safety, or stability; reduced ability to recognize emotions; blunted or numbed affect due to continual masking and prioritization of task completion.

5) Social and relational harm (“dominant culture-aligned,” “behaviorally normative,” “structurally and safety-secure”)

Exhaustion due to code-switching and masking; constant ‘performance’ of identity, development, and understanding; feeling misunderstood and unseen; feeling scrutinized for identity and presentation; reduced ability to communicate needs, thoughts, boundaries, and feelings.

6) Epistemic harm (“dominant culture-aligned”)

Epistemic injustice as both testimonial injustice and hermeneutical injustice (Dotson, 2014; Fricker, 2007); feeling unseen and overlooked due to marginalization of certain ways of knowing, modes of expression, and demonstration of understanding; untapped potential due to normative definitions and measures of talent and ability.

7) Physical and somatic harm (“physically normative and able-bodied,” “structurally and safety-secure,” “affectively normative and regulated”)

Chronic physical health problems and ailments; chronic dysregulation or upregulation of the nervous system; sleep disruption; chronic stress; hypervigilance due to failure to recognize or support health and physical needs; reduced bandwidth and energy for optimal functioning (McEwen, 1998).

8) Equity harm (“dominant culture-aligned,” “socioeconomically and resource-secure,” “structurally and safety-secure,” “developmentally chrononormative”)

Reduced opportunity due to socioeconomic barriers and classism; racialized expectations and labeling; gendered expectations and labeling; underperformance due to stress from marginalization of identities; additional hardship due to lack of structural support for disabilities rooted in limiting deficit-based models (Baglieri et al., 2011; Costanza-Chock, 2010; Davis, 1995); linguistic marginalization.

9) Identity and narrative harm (whole “ideal learner” profile)

Fragile self-worth based on external validators, performance, and compliance; unstable sense of identity and self-concept; internalized perfectionist tendencies; low self-worth; persistent negative self-concept due to labeling and categorization (e.g., “I’m not smart,” “I’m the problem,” “I’m bad at [subject],” “I don’t belong in [higher education, etc.]”).

10) Creativity harm (whole “ideal learner” profile; converges from cognitive, affective, and epistemic harms)

Reduced intellectual exploration and risk-taking; fear and avoidance of uncertainty or experimentation; prioritization of compliance and institutionally-deemed “correctness” over depth, possibility, and originality; reduced generation of novel ideas; creativity conceptualized as unsafe or risky (Resnick, 2017; Immordino-Yang, 2016).

The 4 M's of Design Harm as Learner Responses and Lived Experiences

Building upon the analytic framework of systemic harms across learner dimensions and trajectories, the results of systemic design harm can also be examined through how they are internalized and sustained over time in learner responses and lived experiences, both in- and outside of educational settings. These experiences are often remembered over time as patterns, shaping learners' core self-concept and identity. Their effects extend not just through long-term educational contexts, but even beyond. These lived experiences and patterns can be understood through the following 4-M's mnemonic:

Figure 2. The 4 M's of Design Harm as Learner Responses and Lived Experiences

Misfit: Learners conceive of themselves as misfits due to their perception that they do not align with institutional and systemic expectations, norms, ideals, and definitions of success or ability.

Masking: Learners suppress and override their authentic selves, needs, and modes of engagement or expression to better align with institutional and systemic expectations, as well as to avoid punishment or penalty.

Mimicry & performance: Learners mimic the behaviors and patterns of the “ideal learner,” or overperform in institutionally-valued ways to achieve systemic metrics of success.

Memory & trauma: The effects of systemic design harm persist in memory, often as trauma, and continually shape learners' beliefs about their potential, ability, and self-worth long after the original educational experiences have passed (e.g., a student tracked into a “non-gifted” STEM program internalizes and carries the long-term belief that they are inherently inept or deficient at STEM subjects.)

Path-Diversity and Its Relationship to Systems

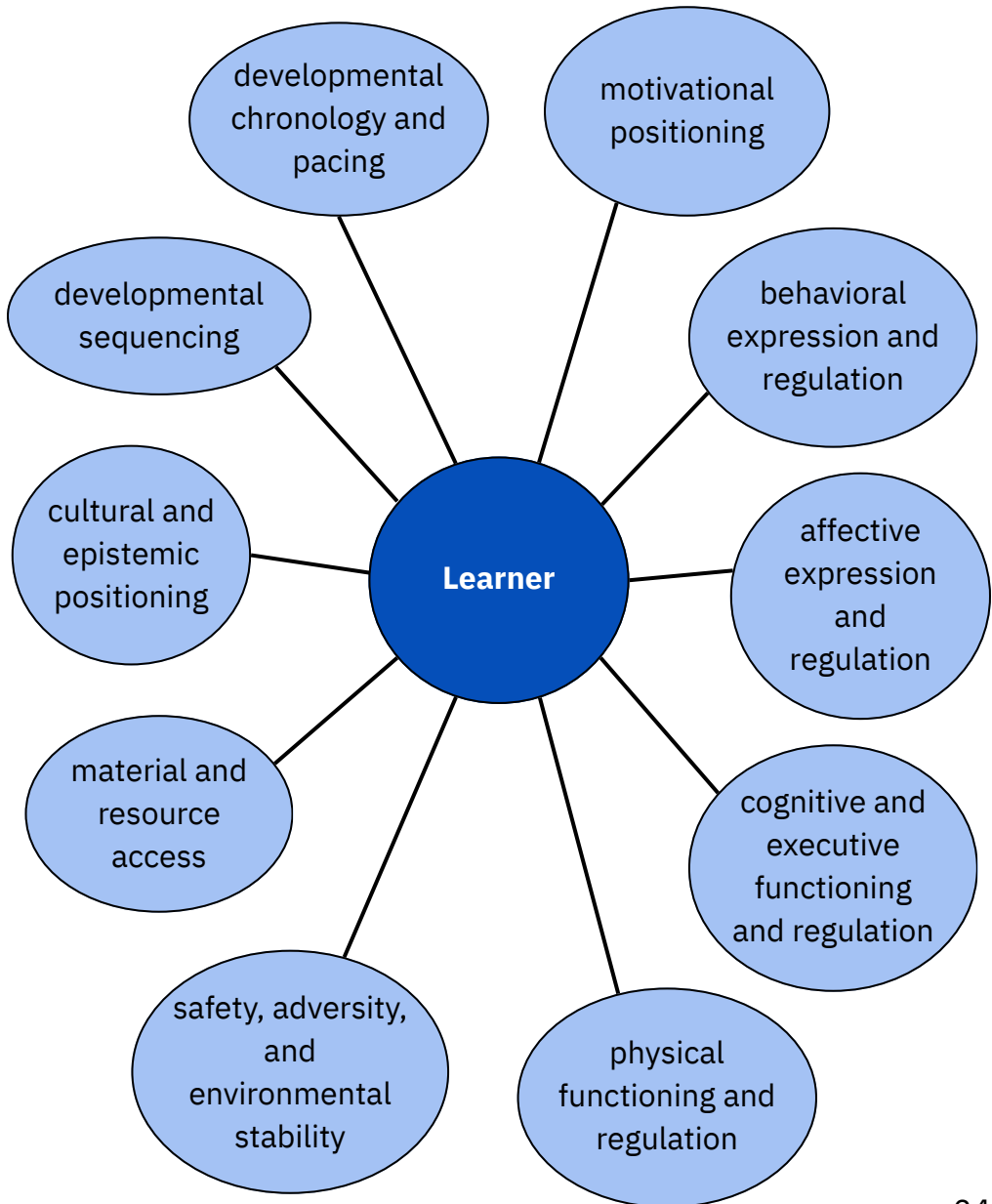
All learners can be understood as ‘**path-diverse**’ learners. **Path-diversity refers to the reality that learners inherently vary in their developmental trajectories, patterns, tendencies, and behaviors across multiple dimensions over time, including pacing, sequencing, and modes of engaging in learning.** At any given point or period, learners occupy different positions along these spectral dimensions, which are dynamic and shaped by a combination of context, circumstance, and behavior.

In relation to educational systems, some learners’ developmental trajectories and patterns tend to align more closely with prescribed norms and idealized expectations surrounding achievement, ability, development, and success. Because educational systems are principally designed for these assumed pathways, they privilege and reward learners whose development aligns more closely with the logic of existing educational structures, policies, institutional practices, and assessment schemes. Learners whose trajectories and patterns diverge from these expectations disproportionately experience constrained opportunity, misclassification, and overlooked potential, where their differences are misinterpreted as indicators of deficiency or failure rather than of limited, inequitable design.

The following diagram presents learner dimensions that emerge as salient considerations within educational systems design. These dimensions are not intended as wholly representative of all forms of human variability, but rather as representative of those learner dimensions that systems most actively engage and operationalize in their designs and structures. Note that these dimensions correspond with those of the “ideal learner” but are presented here as descriptive spectra rather than as evaluations or judgments.

Figure 3. Salient Learner Dimensions within Educational Systems Design

This diagram illustrates learner dimensions that emerge as salient considerations within educational systems design.



Learner tendencies and characteristics exist along spectra across dimensions, and they vary across individuals, contexts, circumstances, and time. These characteristics are not binary or static, since individuals themselves are not static. Despite these realities, systems often treat these dimensions as binary, and learner characteristics as absolute and unchanging. Systems simultaneously reward alignment with narrowly-defined ideals and expectations while marginalizing and punishing divergence from norms as deficiency or failure.

Consider, for example, the dimension of developmental chronology and pacing, or when and how quickly progress legibly evinces relative to institutional timelines. A learner's characteristics sit somewhere on the spectra during a given point or period, where they may exhibit:

- **More chrononormative pacing**, with institutionally-legible progress tending to align more with time-bound and age-normalized milestones;
- **More variable pacing**, with institutionally-legible progress tending to display more varied cadences, marked by plateaus, pauses, and periods of acceleration, and periods of recursiveness.

Note that developmental chronology and pacing is different from but related to developmental sequencing, where the latter concerns the order in which growth and progress takes place.

When educational systems are designed for a certain chrononormative pace, learners' temporal differences becomes interpreted as "delay," "lateness," or "falling behind." Variability is therefore deemed flawed or deficient, which glosses over the multiple ways growth might emerge, as well as the role of key factors in growth, such as context, safety, and environmental stability. Ultimately, learner variability across dimensions—including developmental chronology and pacing—is dynamic and spectral rather than static and categorical. This concept is key to dismantling the myth of the "late bloomer" in the following section.

Dismantling the Myth of the “Late Bloomer”

The language and concept of the “late bloomer” implicitly arise from a biased and flawed assumption: that human development follows a single standardized timeline, one that is linear, consistently paced, and directed in a presumed “correct” sequence. This normalized timeline reflects a systemic oversimplification of human variability into a single sanctioned rhythm and direction, developed by institutions to facilitate organizational efficiency, convenient comparison, and standardized ranking. Herein, deviation from chrononormative expectations is pathologized as “late” or “delayed,” rather than treated as the reality of human developmental variability.

“Lateness,” therefore, is a derivative systemic interpretation of human variability, not an objective measure to accurately describe learners.

In adopting this “late bloomer” conceptualization, educational systems produce the concept of **temporal deviance**, wherein they pathologize learners who diverge from normalized cadences and sequences and treat these differences as failure or deficiency. The term “late bloomer” smooths over the realities of structural conditions that significantly shape learning trajectories, including limitations in access to opportunity, resources, and support. While the softening term “bloomers” lends a gentle veneer of generosity to the concept, it ultimately frames individual learners and pathways as the problem, rather than the reductive and biased institutional norms that measure and define “progress” or “success” in the first place.

There are multiple reasons why learners' institutionally-valued and -legible growth may emerge at different times than educational systems expect. For instance, some learners undergo development in different rhythms and progressions than normalized or idealized, where they may experience motivation in spurts rather than at a fixed cadence, or discover their interests and direction at different times than systems permit. Other learners face adverse conditions that require them to reallocate their energy, resources, and perseverance toward survival, safety, and adaptation rather than formal learning.

In such cases, growth becomes legible to institutions only when conditions of safety, stability, and personal bandwidth coincide and sustain consistently enough to support continued learning and exploration (see the next section, "On Safety, Equity, and Educational Perseverance [\"Grit\"]"). These patterns of growth are rooted in human developmental realities, not supposed individual shortcomings.

On Safety, Equity, and Educational Perseverance (“Grit”)

Discussions of equity, privilege, and learner perseverance—including discussions of educational “grit”—tend to fail in acknowledging the critical importance of safety and conditions surrounding it, despite **safety** being a prerequisite for maximal, sustained learner growth and engagement.

As introduced in Maslow’s hierarchy, safety represents a fundamental human need whose presence allows individuals to redirect their effort and resources beyond survival and toward forms of growth, including exploration and self-actualization (Maslow, 1943). While discussed in psychological theory more broadly, the importance of safety within contexts of learning and educational design have not been sufficiently explored.

Conditions of consistent and sustained safety allow learners to direct their psychological, cognitive, and energetic resources to learning endeavors, including exploration, curiosity, risk-taking, and engagement with long-term goals and aspirations. Without safety, learners cannot fully recognize and communicate their needs or maximally engage with equity-focused principles and efforts. The latter includes engaging with realities of both structural and interpersonal harm, particularly when this involves confronting painful personal experiences or lived realities, which may provoke threat responses, perceived loss of control, or intolerable vulnerability.

When safety is minimal or otherwise unpredictable, learners redirect their perseverance, energy, and resources toward survival efforts rather than learning. Unsafe conditions may evince in a number of ways, including examples such as significant adversity, or school environments that discourage learner agency or specific modes of expression. In conditions of low or tenuous safety, learners prioritize managing uncertainty, internal or external volatility, or environmental equilibrium rather than attaining institutionally-valued forms of learning. Under these conditions, learners may appear as if they are disengaged, stagnant, or “lack grit”; however, perseverance is present and merely redirected toward more pressing demands that are not monitored or measured by institutions.

At the systemic level, safety creates the conditions for learners’ efforts to become legible in institutionally-measured and -valued ways, including progress that appears more linear, chrononormative, consistent, and goal-directed. Safety is therefore a prerequisite for the form of perseverance that educational systems reward and conceptualize as “grit,” or sustained long-term effort oriented toward a single project or pathway (Duckworth et al., 2007). Without understanding or accounting for safety in their norms and metrics, systems and institutions structurally misinterpret reallocated perseverance and effort as learner inadequacy or failure.

Ultimately, perseverance very much persists under unsafe or unstable conditions, although redirected away from formal learning and toward other demands. Systems that measure learner perseverance or “grit” through standardized assessments and outcomes will therefore continue to misidentify adaptive reallocation responses as individual learner deficiency.

System-Level Solutions: Designing for Path-Diverse Learners

Designing effectively for path-diverse learners means unlearning and revising inaccurate conceptions of uniformity and normalized ideals, then centering human variability as the guiding principle instead to match developmental realities. This does not mean abolishing systems as they exist, or eschewing structure for unlimited flexibility, both of which would yield significant costs for learners and stakeholders alike. Instead, it means building more options, flexibility, and affordances into systems architecture so that diverse learners and pathways are welcomed, recognized, and supported, rather than treated as exceptions or triage cases after the fact. **The following design principles are help realize this in practice:**

1) Design for human variability and diverse pathways, not uniformity or conformity to normalized ideals and development.

Systemic structures must effectively prepare and build for human variability in pacing, developmental pathways, learning tendencies, and behaviors. Examples of structures supporting variability include modular curricula, which mitigate the rigidity of prescribed learning sequences; windows for demonstrating mastery and understanding (rather than rigid points), which promote flexible pacing; and multiple learning pathway options and opportunities, which reduce inaccurate, unrepresentative, and limiting classifications of learners.

2) Recognize and integrate multiple valid ways of knowing and demonstrating knowledge for epistemic justice (Fricker, Dotson).

Systems must build structures that legitimize various valid ways of knowing and demonstrating learning and understanding. This means keeping standards consistent while allowing learners to demonstrate knowledge and progress in equally valid ways that work for them (e.g., written, oral, project-based), rather than privileging and rewarding a dominant epistemology, method, or mode of expression.

3) Redefine progress as a developmental process that is nonlinear, variable, and longitudinally measurable.

Systems must define and evaluate progress as longitudinal—specifically, over time, and during windows rather than milestone points—and as centered on learner understanding and integration of ideas and skills with increasing complexity and depth. Linear, chrononormative benchmarks misinterpret learner potential and disadvantage learners who follow different learning trajectories, timelines, and sequences.

4) Normalize recursive learning processes, periods of internal integration, and re-engagement with learning and materials as features of development.

To center path-diversity, systemic structures must intentionally support developmental realities such as revisitation of prior material, pauses and plateaus (which are often periods of internal integration), directional changes, and returns to learning—without stigma or penalty. These processes represent the various cadences and patterns under which learning occurs over time, and they should be structurally supported rather than viewed as deficient, inferior, or symptomatic of failure or regression.

5) Integrate flexibility into educational structures rather than offloading it onto educators as additional discretionary labor.

When systemic structures offer limited flexibility and learner affordances, the burden of responding adaptively goes to educators as invisible, discretionary labor. Flexibility must be built into policy, institutional structures, and assessment models to allow for learner adaptation and to prevent reliance on educators' discretion or informal accommodations, which creates both educator burnout and inequitable inconsistencies across learners. Structures including customizable educational pathways, broadly accessible opportunities, and varied assessment modes may operationalize flexibility at the systemic level.

6) Participate in co-design with learners to develop informed insights and responsively shape systems.

Learners, especially those who are historically marginalized or deemed further from the “ideal learner” norm, hold key insights on where systems fail to effectively support human variability and diverse developmental pathways. By consulting and prioritizing learners in design and decision-making processes, systems facilitate the development of more responsive, resilient, and effective educational structures.

7) Incorporate reflective assessment into educational structures operating across systemic, institutional, and individual levels.

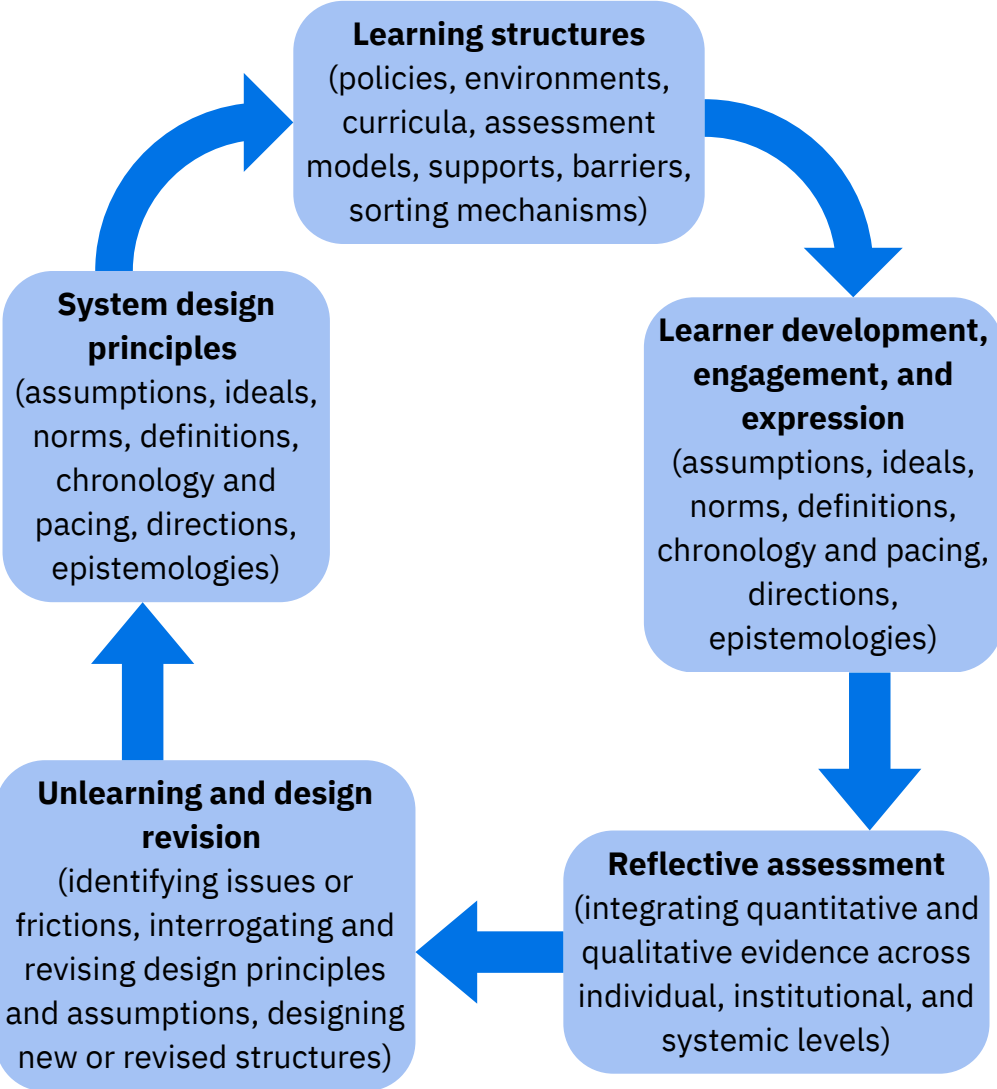
To foster responsiveness to path-diverse learners, systems must implement assessment schemes that produce feedback useful for iteratively revising design rather than sorting or ranking learners. Both quantitative and qualitative evidence should be collected and analyzed across individual, institutional, and systemic levels, namely to identify structures conducive to learner growth as well as points of structural friction. Reflective assessment allows systems and institutions to identify how and where design falls short, and how structures can be improved responsively to serve learners. The following section provides a visualization of how reflective assessment functions within a broader system feedback loop geared toward educational design and revision processes.

Note that the above processes also require integrating the practice of **unlearning** across systemic, institutional, and individual levels. This issue will be explored more fully in future work.

Altogether, the above design principles represent an important shift in how educational systems locate, analyze, and respond to learner variability, development, and path-diversity.

Figure 4. Path-Diverse Educational Design as a Recursive System

The diagram below visualizes a systemic feedback loop of path-diverse educational design, illustrating the interactions between system design, learning structures, learner experience, reflective assessment, and ongoing unlearning and design revisions.



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