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Policy Choices for Educational Futures

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Abstract

Policymakers lack frameworks to evaluate educational models against future uncertainty. This paper develops a future-oriented evaluation framework using a 2060 benchmark to assess eight institutional approaches to education. We contrast this forward-looking methodology with traditional metrics, highlighting limitations in addressing long-term governance challenges. Utilizing a qualitative macro-trend backcasting methodology alongside a systematic review of 18 contemporary policy reports, our analysis reveals that most current recommendations are incremental rather than transformational. To move beyond centralized, compulsory systems, we advocate for decentralized, personalized learning ecosystems. Based on macro-trend backcasting, we propose policy guidelines for implementing transformative educational governance strategies better suited to future societal needs.

1. Introduction: Future Vision

Policymakers worldwide confront a governance challenge: how to choose between competing educational institutional models when facing unprecedented uncertainty about the future. Traditional policy evaluation methods focus on present-day metrics—test scores, graduation rates, economic returns—that may be inadequate for assessing institutional readiness for dramatically different future conditions. This paper addresses this policy challenge by developing a future-oriented institutional evaluation framework. Rather than defaulting to incremental reforms of existing systems, we argue that policymakers need analytical tools for assessing radical institutional alternatives against plausible future scenarios. Our analysis provides such a framework, evaluating eight distinct educational governance models against a systematic vision of 2060 conditions.

The explosive development and mainstreaming of AI technology promises possible automation of tasks in virtually every field. Coined by some as the AI “gold rush”, developers are furiously competing to create faster and more advanced AI systems (Grassini, 2023). If the current pace of development is maintained, AI and associated technologies could soon make human labor largely redundant (Gates 2026). Total technological unemployment is therefore a possibility in the near future, which would lead to the creation of a leisure society (Matusov, 2020). This transition mirrors macrohistorical shifts away from labor burdens, where machine capital absorbs routine tasks to liberate humans toward leisure and higher-tier self-actualization (Mureithi, 2019). Undoubtedly, the automation of production will intensify, meaning the future of human laborers itself is uncertain. And yet, unimaginable arenas of employment may appear in novel sectors such as the space frontier. The blossoming of AI and of information technologies will improve access to knowledge, making government restrictions on information or attempts at censorship futile. With access to knowledge being no longer the purview of a specialized class of people, systems of education could themselves become far more decentralized and student specific than they are today. Already, these systems have demonstrated greater student outcomes (Allcott & Ortega, 2009). From a policy perspective, these technological and social transformations pose fundamental questions about institutional design and regulatory oversight. How should governments fund and structure educational systems when traditional employment models may become obsolete? What governance mechanisms

can maintain social cohesion when trust in centralized institutions continues declining?] These are not merely educational questions but core challenges of public administration in an era of accelerating change.

McKinsey estimates that the global space economy will be worth $1.8 trillion by 2030 up from $630 billion in 2023 (Acket-Goemaere et al., 2024). The private space sector is growing quickly, and companies with varying agendas are populating the market. For example, extra-terrestrial mining and tourism companies have formed with a keen interest in exploiting the space frontier (Hampson, 2017). Fueled by the need for more resources and the human urge for exploration of new frontiers, the expansion of humanity across space is almost an inevitability.

In opposition to the decentralization of knowledge, centralization of new facets of our social life, such as space regulation could also occur. International space policy is ambiguous, and U.S. regulation on the domestic commercial industry is complex and unclear (Hampson, 2017). A competition for space resources among the new rival superpowers- the USA and China could lead to the creation of nationally regulated space markets that serve national security interests as much as corporate bottom lines.

Since the Covid pandemic it has become evident that trust in government and democratic institutions is declining (Bollyky, 2024). Some attribute the popularity of populism and nationalism to a rise in the distrust of government and frustration with increasing wealth inequality (Sasaki, 2021). This distrust may well also contribute to the decentralization of aspects of life such as education, where people will likely prefer localized regulation. If local communities are the only trusted ones, pressure to decentralize power and decision making will stay strong. The more dispersed decisions about education and society become the greater the likelihood that multiple experiments and innovations are on the horizon.

The cultures of the future will undergo stress and uncertainty, making culturally relevant education of the future youth paramount. Shinobu Kitayama and Ayse K. Uskul conceptualize culture as “a collective-level phenomenon that is composed of both socially shared meanings such as ideas and beliefs and associated scripted behavioral patterns called practices, tasks, and conventions” (Kitayama & Uskul, 2011). In WEIRD societies, independence of the self is strongly valued, especially in the middle class (Kitayama et al., 2022; Henrich 2022; Kitayama & Uskul, 2011). Therefore, the ideas and values of future cultures will likely possess greater independence, as the interdependent structures of non-Weird cultural regions increasingly become infused with Weird values. Greater emphasis on individualism and nonconformity as values will lead to educational approaches that are personalized and more self-directed.

A century ago, Max Weber famously observed that the rationalization of world perception led to disenchantment (Marotta, 2023). The shift towards science as an explanation for incomprehensible aspects of life teaches society to reject magic and wonder. He described an “iron cage” of capitalism, binding humanity to productivity and thrift (Fukuyama, 2003). Materialism can be defined as “the extent to which individuals attempt to engage in the construction and maintenance of the self through the acquisition and use of products, services, experiences, or relationships that are perceived to provide

desirable symbolic value" (Shrum et al., 2013). Since the middle ages, human identity in the Western world has been shaped by possessions. Acquiring any type of thing is used as a mechanism for establishing and sustaining a person's worth, satisfying motives such as self-esteem, belonging, and meaning (Henrich 2022: Shrum et al., 2013). In the future, increased automation and improving technology will only enhance our ability to create materials, making identical possessions available to anyone. Therefore, it can be predicted that the value in handcrafted uniqueness will be reinstated in opposition to this movement. The European Union even proclaimed the "future is handmade" (Chatterjee, 2016). Unique, creative, and handcrafted material things will become more important for our psychology and identity than machine made counterparts.

Original thought thus becomes increasingly more valuable. An excellent student in conventional education displays strong pattern recognition, performing well on standardized tests (Matusov, 2020). Taught to behave like machines, students are molded into individual computing units (Sugata, 2013). AI blurs the lines between human and machine, and outperforms humans in computing and learning tasks. It has even developed the potential for computational creativity making marketable artworks, mathematical theorems, and music; even playing alongside professional musicians (Colton & Wiggins, 2012). Therefore, unpredictable, impulsive actions and thought will become desirable in a computer driven world. The erratic nature of humanity will be the last remaining separation between humans and AI and therefore important to nurture in children. AI effectively mimics all predictable aspects of the human brain. Its logic and pattern recognition abilities will surpass humans, but AI will never have the ability to make unpredictable human error. Therefore, erratic human error will become of great value as it cannot be replicated. The policy implications of these trends are profound. Centralized, standardized educational institutions designed for industrial-era workforce preparation may prove not merely inadequate but counterproductive in this emerging context. Policymakers must therefore consider whether maintaining existing institutional structures represents prudent conservatism or dangerous path-dependency that leaves societies unprepared for foreseeable challenges.

In conclusion, the future is likely to be characterized by rapid technological advancements, particularly in artificial intelligence. While this brings both opportunities and challenges, such as potential job displacement and the need for new governance structures, it also presents a chance to reimagine education, explore new frontiers, and rediscover the value of human creativity and unpredictability. As we navigate this rapidly changing landscape, it will be essential to foster cultural understanding, promote innovation, and ensure that technological progress is ethically managed. If this is the future, what type of education prepares us for it?

2. Methodology: Macro-Trend Backcasting and Policy Evaluation Framework

To address the inadequacy of traditional policy evaluation methods, we developed a qualitative macro-trend backcasting methodology. Backcasting involves defining a plausible future scenario—in this case, a 2060 benchmark shaped by AI automation, space commercialization, and institutional decentralization

—and working backward to evaluate which current institutional frameworks best prepare citizens for these conditions. This approach represents a departure from conventional policy analysis, which typically evaluates institutional alternatives against present-day performance metrics. Instead, it offers policymakers a systematic tool for institutional choice under long-term uncertainty.

Our exploration of the future took three structured pathways. First, we conducted a foresight brainstorming workshop with students and faculty to generate inductive future scenarios. Shared themes were synthesized into a foundational document. Second, we consulted future-oriented media and documentary analyses (A Brief History of the Future | PBS, 2024; Schooling the World (2010), n.d.). Finally, we conducted a systematic literature review of academic literature on educational futures, including close readings of Matusov (2020) and others (Bourn, 2021; Facer & Sandford, 2010; Holfelder, 2019; Rusmini, 2014; Vadillo & Bucio, 2020). Prevailing through this synthesis was a core theme of profound societal uncertainty, which became the guiding baseline for our evaluation.

Following the establishment of our 2060 benchmark, we systematically selected and evaluated eight unique educational approaches. We compiled a comprehensive list of educational systems from academic literature, removing redundant methods to isolate eight distinct institutional models. For each approach, we reviewed scholarly articles, institutional self-descriptions, and policy literature to capture their structural paradigms. During this review, we developed a comparative matrix focusing on variables of governance, curriculum control, and student agency. One of the key variables was the degree of choices students were given, capturing the amount of "authorship." We stratified the list into three categories of authorship: Unschooling and Indigenous education (highest authorship); Reggio Emilia, Waldorf, Montessori, and Project-Based Learning (mixed authorship); and Parochial/conventional schools (limited authorship).

Additionally, we systematically reviewed the way the education sector conceptualizes the future of education and needed reforms. Examining 18 policy reports by governments, private companies, foundations, global governance organizations, and education researchers, we concluded that, mirroring academic work, most thinking is heavily reform-oriented, with only two reports containing transformative frameworks.

3. Authorship and Uncertainty as Policy Metrics

Authorship in education is the promotion of student voices and choices (Matusov, 2020). Authorship invites uncertainty into education, allowing students to progress at a personal pace and removing the anticipation of routine scheduling. When given independence in thought and action, students are able to discover their interests at their own pace. Certain children may aggressively pursue one subject, advancing well beyond their grade level while others explore multiple pursuits. Uncertainty on a class-level is therefore formed as all students will follow a different educational trajectory. This variability prepares children for an uncertain future by exposing them to people of varying skill sets and interests. Additionally, authorship also creates spontaneity. Children are allowed to creatively explore what appeals

to them in the moment. This process of allowing children to freely navigate the world is not usually thought of as a critical part of education. However, through unplanned, spontaneous exploration, children learn to navigate change and variability.

The future will not progress in an orderly fashion with certain events occurring neatly on a schedule, so naturally education should reflect this. In the conventional viewpoint, this is thought of as inefficiency because it delays the implementation of curriculum. However, this teaches a curriculum not defined in terms of content but in adaptability. In the context of our evaluation framework, authorship emerges as the primary analytical criterion because it directly captures an institutional model's response to uncertainty. While traditional metrics measure conformity to standardized outcomes, authorship measures the institutional capacity to cultivate adaptive, innovative citizens. From a public administration standpoint, funding and supporting high-authorship models represents an investment in societal resilience.

4. Policy Analysis of Current Reform Discourse

Our review of 18 policy reports from governments, foundations, and international organizations reveals a striking pattern: most contemporary policy discourse focuses on incremental reforms within existing institutional frameworks rather than fundamental structural alternatives. These reports typically recommend updating curricula for "21st century skills," integrating new technologies, and training teachers for changed roles—all valuable but ultimately conservative approaches that preserve centralized, age-graded, compulsory schooling models. Such frameworks run the risk of trapping institutions in a cycle of "techno-solutionism," rather than actively pivoting toward what futures theorists call a true "Transformation" archetype—where learning is reconfigured into an immersive, agentic, and decentralized ecosystem (Georgiou, 2025).

Only two reports examined articulate truly transformational visions that question fundamental institutional assumptions. This pattern suggests that policy communities may be constrained by institutional path-dependency, limiting consideration of alternative governance models that might better serve future needs. Our analysis attempts to expand this policy conversation by systematically evaluating radical alternatives alongside conventional approaches.

Reform vs. Transformation

Most recent reports on the future of education emphasize reform within existing educational systems, adapting them to better meet the demands of a rapidly changing world (see Appendix). These visions largely respond to technological advances—particularly AI—and the evolving needs of the workforce. Common recommendations include updating curricula to prioritize soft skills like creativity, problem-solving, emotional intelligence, and collaboration alongside digital literacy. Many reports advocate for personalized learning pathways, greater use of hybrid technologies, and the continuous upskilling of both students and teachers. However, these changes are typically framed as necessary adjustments to preserve the core structure of schooling, rather than as fundamental transformations.

Another shared theme is the evolving role of teachers in the face of automation and digital platforms. Rather than replacing teachers, most reports stress the importance of equipping educators to act as coaches, mentors, and facilitators of student-centered learning. Even with these innovations, the underlying assumption remains that schooling will continue to prepare students primarily for participation in the labor market—albeit with more flexible, personalized, and technology-enhanced methods. Teachers continue to hold knowledge that they will dispense to learners in classrooms with the aid of digital technologies.

Key to the reform vision of most previous policy analyses is the assumption that age homogenous cohorts of children are gathered in one place under the guidance of a teacher. While they want to offer children great freedom in exploring online opportunities and encouraging them to be tech-literate, these policy approaches don't offer new visions for education that match the scale of the transformations we expect to see in the world. Transformative changes in work, leisure, and even bio-life demand that we have much deeper visions for rethinking education.

Two exceptional reports, by Education Reimagined and the Carnegie Foundation, articulate a more transformative vision. Rather than reforming schools to better serve existing systems, these proposals imagine education as a site for radical experimentation in democratic community life. They call for a shift away from hierarchical, standardized models toward learner-centered ecosystems that prioritize self-direction, social connection, and the cultivation of ethical dispositions alongside academic skills. This aligns with critical systemic foresight which argues that navigating systemic breakdowns requires decoupling the concepts of "education" and formal "schooling," replacing top-down factory models with nimble, self-organized configurations of learning centers (Kesson, 2020). This vision positions education not simply as preparation for the future but as a space where young people actively co-create more just and sustainable worlds.

5. Educational Institutional Models: A Governance Perspective

Education approaches as institutional models may be grouped into three categories based on the level of authorship in learning and exploration. We refer to these as limited authorship, mixed, and extensive authorship approaches. Authorship is the ability of the student to write the story of their education, where they can decide upon the path of their journey (Matusov 2021). Parochial and conventional education allow for the least authorship, while unschooling and indigenous education allow for the greatest, and Reggio Emilia, Montessori, Waldorf, and project based learning fall in between. Tolerance for student independence is a direct result of how each approach views childhood, adulthood, and the separation between the two. Joseph Dunne describes beliefs about childhood as either “privileged” or “privative” (Dunne, 2008). Conventional and parochial education follow the “privative” belief, viewing childhood as a deficiency that must be overcome with education (Dunne, 2008). Conversely, unschooling and indigenous education view childhood in the “privileged” sense, appreciating and nurturing the values associated with it (Dunne, 2008). The more privative the beliefs, the less scope exists for authorship. And the greater an understanding of childhood as privileged, the more likely that authorship will be

emphasized. In evaluating these approaches, we extend the pedagogical analysis to consider the governance, regulatory oversight, and resource allocation models each requires.

Centralized Governance: Parochial and Conventional Education

In conventional and parochial education the intention is for children to be ushered into adulthood through the learning experience. The informed “adults” are responsible for educating the uninformed “children”, bridging the education gap and introducing them into society (Romero, 2018). Adulthood is seen as the destination point of development, and childhood is a state of inadequacy (Dunne, 2008). Education is the vehicle of choice to deliver children to this pre-decided upon endpoint. Children are seen as passive recipients of education, all viewed and taught identically to achieve the same predetermined outcome (Avgitidou et al., 2013; Holfelder, 2019; McLaren, 1988). The purpose of education is to transform the uneducated child into a conscious adult who is an active and productive member of the community (Romero, 2018). Students are uninvolved in the design of their own education and receive pre-designed knowledge (Holfelder, 2019). The system of compulsory conventional education is built on this view and that shapes how it is operationalized.

From a policy perspective, while conventional education is relatively novel in human history, its influence can be seen across the world. Inspired by factories, its design allows it to be reproduced anywhere easily (McLaren, 1988; Provenzo & Provenzo, 2009). Because of this, it centers around a pre-designed curriculum usually including subjects such as math, reading, science, and history. This model relies heavily on centralized governance structures, standardized testing accountability frameworks, and bulk resource allocation tied to enrollment numbers and physical infrastructure. Teachers control and lead students to a determined end goal, measured through standardized or other forms of quantifiable testing (Saultz & Saultz, 2017). All children in a conventional school are taught in classrooms with peers of the same age. In this environment, the individual student becomes replaceable. This has enabled conventional schooling to be implemented across the world, often at the expense of knowledge about and socialization into the local culture (Romero & Yellowhorse, 2021). Children are treated as consumers of knowledge and products of schools.

Traditionally parochial schools were designed to instill the beliefs, rituals, and conventions of a specific doctrine into students (Vermeer, 2009). Because of this predetermined end goal, denominational schools operate similarly to conventional schools with a structured schedule and a designed curriculum. Recently, religious education has shifted towards cultivating spirituality in students through exposing them to numerous other religious systems as well (Conroy & Davis, 2010). It is increasingly difficult in modern society to indoctrinate students in a single religion, as information of other belief systems is easily accessible (Vermeer, 2009). As a result, modern parochial schools must either embrace religious diversity or attempt to prevent society from entering the school. This has led to more intense, narrow, and rigid parochial schools (Heilman, 1996). For instance, in many Madrassas and Yeshivas the main teaching consists of memorization and close study of religious texts with secular subjects such as math

and language arts as secondary supports (Blau, 2022). Their institutional goals continue to define these models as a matter of strict policy adherence, often functioning as closed regulatory ecosystems.

Decentralized Governance: Unschooling and Indigenous Education

On the opposite side of the authorship scale we find unschooling and indigenous education. While Indigenous education and unschooling are distinct, they share similar foundational characteristics, cultivating life-long, experiential, and non-systematic learning (Romero & Yellowhorse, 2021). These practices give children agency in their education, celebrating the individual child for their culture, experiences and interests (Morrison, 2008; Townsend-Cross, 2004). Here the relationship between childhood, adulthood, and education is not viewed as hierarchically organized according to information. Childhood is appreciated for the unique qualities children possess, some of which may be lost in the transition to adult life (Dunne, 2008). Because adulthood carries on portions of these characteristics, childhood and adulthood are dynamic (Dunne, 2008). People are a holistic mix of child and adult. Therefore, education is not something adults have and children need, but rather a shared process or flow of knowledge (Morrison, 2008). As a result, the unschooling approach does not believe the child needs formal training to transition to adulthood. Education does not reside in one place of being but emanates from everywhere and everyone. Students receive information and learn from many sources, while also giving knowledge to the world (Morrison, 2008).

While all Indigenous cultures possess unique traditions, most share a view of childhood that escapes the modern Euro-American or “conventional” school system. In this view, childhood is not antithetical to adulthood, but rather a stage in life. Education begins at birth and continues throughout the course of a person’s life (Townsend-Cross, 2004). Additionally, knowledge does flow linearly from teacher to student, but from the community to the youth and reciprocally from youth to the community (Dei & Simmons, 2011). Indigenous knowledge systems are themselves also distinct from Western ones (C. Ahenakew, 2016; C. R. Ahenakew, 2017). Therefore, comparing the outcomes of Western education and Indigenous education is like attempting to compare apples to oranges. Each possesses a relevant knowledge system based on each society’s communal needs, experiences and values. The Western knowledge system(s) have become dominant around the world only recently partly as a consequence of European colonialism (Sugata, 2013). However, the Indigenous teaching philosophies and ways of understanding children developed over centuries and should not be ignored. Indigenous scholars warn that they must also not be implemented within conventional schooling systems for European achievement goals (C. Ahenakew, 2016).

The unschooling/democratic approach parallels indigenous education in several ways. Children are viewed as intrinsically motivated, competent, and capable of authoring their education (Riley, 2020). The unschooling environment involves children choosing what to learn, when, and how (Morrison, 2008). A child can pursue a wide variety of subjects, and focus on what interests them most (Gray & Riley, 2013; Morrison, 2008; Romero, 2018). This exploration allows children to become truly invested in their education, as they choose how to manage their time. Unschooling is experiential and community based,

and unschoolers often take advantage of local museums, playgrounds or homeschool groups (Riley, 2020). Children are guided by parents or facilitators who teach cultural and community traditions by example. This institutional model is distinctively oriented to context and local variety. From a regulatory standpoint, these models challenge state monopolies on curriculum and require a shift from prescriptive oversight to highly decentralized policy frameworks that trust local networks and families as primary educational arbiters.

Mixed Governance: Montessori, Reggio Emilia, Waldorf, Project Based Learning

A combination of both privative and privileged philosophies results in Montessori, Reggio Emilia, Waldorf, and Project Based Learning (PjBL). They can be categorized as teacher guided methods (Montessori, 1912). Here teachers are facilitators, setting frameworks for learning content but allowing authorship in the path to knowledge (Hewett, 2001; Loyens, 2023). Time for student exploration is incorporated into the daily structure (Uhrmacher, 1995). Emphasis is placed on children's rights, which encompasses both the right to personalize their education journey and the right to receive wisdom from guides (AMI, 2024; Hewett, 2001). Knowledge is therefore supplied both by "knowledgeable adults" and the community/environment the student is immersed in. The environment is a curated one, thoughtfully designed to invite student exploration rather than left totally open. Schools in these systems value both conventional knowledge and exploration (City Montessori School, Lucknow, India, n.d.; "Kimberton Curriculum," n.d.). Children are viewed as worthy and capable in shaping their own education, but still in need of learning Western knowledge systems.

From a policy perspective, Montessori seeks to ensure children are given an educational environment conducive to independence and imagination (AMI, 2024; Duckworth, 2006; Phillips, 2022). Usually, this is enacted by combining structured curricular lessons with ample time for independent exploration. It is thought that when children are provided an emotional, moral, and behavioral foundation will be motivated to lead their own education (AMI, 2024). Therefore, Montessori seeks to develop the whole child (Aljabreen, 2020). Teachers collaborate with students, making the education process mutually reinforcing and reciprocal. Incorporating Montessori into public systems often requires policymakers to create specialized credentialing pathways and adapt rigid space and age-grading regulations.

Reggio Emilia extends the collaboration between teachers, community, and students in generating the curriculum (Hill, 1999; Reggio Children - Values, 2022). This allows students to become better educated about their local traditions. Reggio Emilia is traditionally an Early Childhood education style, but has potential for integration in all age groups. The hundred languages frame is key to the Reggio Emilia approach (Hewett, 2001; Hill, 1999; Reggio Children - Values, 2022). Conceptually, it is used to emphasize the creativity and complexity of the child. It is thought that children have one hundred languages or channels for expressing themselves (Hewett, 2001; Reggio Children - Values, 2022). For this reason, Reggio Emilia education encourages development through artistic means such as music, drama, drawing, writing, or singing (Hill, 1999). Each builds unique knowledge for the student, allowing

them to unlock all “languages”. Scaling Reggio Emilia at a policy level demands robust municipal-level funding and deep community integration, moving away from centralized state control.

Likewise, creativity and artistic expression are key pillars of Waldorf education. Art encourages development through transmediation. This is the practice of expressing ideas in and through media, and then using different media to convey the same idea (Nordlund, 2013). Additionally, teachers utilize art as a means of communication regularly in the classroom (Uhrmacher, 1995). Here, children are believed to require holistic nurturing to fulfill their potential. Waldorf education also cultivates spirituality through anthroposophy. This system operates on the assumption that when a person is fully developed they are able to access the “spiritual world” (Uhrmacher, 1995). Holistic Waldorf education is designed to unlock this natural spirituality in students (Nordlund, 2013; Uhrmacher, 1995). In this way, children are viewed as needing more sequential guidance than in other methods in this category. Paralleling parochial education, Waldorf develops both the spirit and knowledge of children. Waldorf education treats children as possessing strong potential, but requiring guidance in all facets of development.

Project-based learning as an institutional model follows a more student-led model. Children are assumed to have natural curiosity and an intrinsic desire to fulfill this curiosity. Teachers are responsible for providing a question or problem to students, and students learn by applying information to this problem (Condliffe, 2017; Dawson, 2023; Loyens, 2023). PjLB suggests children's knowledge retention increases if they can apply it to real life. Students collaborate with each other and their teacher in order to investigate and design solutions to their project (Condliffe, 2017). In this approach, children are given responsibility for retaining relevant knowledge and implementing it in their project. Project-based learning has been adopted in a wide range of schools for particular subjects or even within just a few classrooms. It draws on the intellectual tradition of John Dewey who advocated for project-based learning as a key to developing democratic virtues (Williams, 2017). Implementing PjBL universally would require fundamentally rewriting assessment policies, shifting from multiple-choice standardized testing to portfolio and performance-based accountability metrics.

6. Policy Implementation Considerations

The institutional models we identify as most future-oriented—unschooling and indigenous education approaches—present significant implementation challenges for policymakers. These approaches require fundamental shifts in regulatory frameworks, from prescriptive oversight of standardized curricula to quality assurance mechanisms for highly individualized learning pathways. Such transitions pose questions of political feasibility, public accountability, and resource allocation that conventional policy analysis must address.

Policymakers considering movement toward higher-authorship models must navigate several key challenges. First, regulatory frameworks designed for standardized institutions are poorly suited to decentralized, personalized approaches. New governance mechanisms would need to ensure educational quality without constraining the flexibility these models require. Second, public

accountability systems based on standardized testing and uniform outcomes would require fundamental reconceptualization. Third, resource allocation formulas tied to enrollment in traditional institutions would need restructuring to support diverse learning ecosystems.

The political economy of such transitions also merits consideration. Educational institutions represent significant vested interests—teachers' unions, administrators, textbook publishers, testing companies—that benefit from current institutional arrangements. Successful implementation of transformational approaches would require careful attention to stakeholder concerns and transition costs. However, the potential benefits of institutional models better aligned with future conditions may justify these implementation challenges.

7. Conclusion

Institutional models that maximize learner authorship face significant barriers but offer the greatest potential for developing citizens capable of thriving in uncertain futures. The future is inherently uncertain, but the fast-paced, transforming, and chaotic state of our world only amplifies this. Technology that was unimaginable a century ago, such as artificial intelligence, is now integrated into our everyday lives. Looking toward the future, projections of developing trends can be made, but the overall state of the world in fifty years is incredibly uncertain. As our analysis demonstrates, the choice between incremental reform and institutional transformation is ultimately a choice between preserving familiar but obsolete governance structures and embracing uncertainty as a pathway to societal adaptability. Our vision of the future is based upon trends currently developing, and augmented by others visions. Combined, they paint a picture of a complex, varying world.

Those who inhabit this future, the children of today, will need the tools and knowledge to navigate and thrive within this constant change. This therefore means children must be adaptable and comfortable in situations or environments of uncertainty. The education of today must necessarily provide these experiences by exposing children to uncertainty. Policy approaches that allow students to experience uncertainty in their learning journey will be best suited for this future. For policymakers navigating this choice, our future-oriented evaluation framework provides a systematic approach to institutional assessment that extends beyond education to other domains of public policy facing similar challenges of governance under uncertainty. Conventionally, content mastery has been viewed as the end goal of education, and therefore used as a metric for evaluating education. Because we propose viewing the future as uncertain, exposure to uncertainty is then a suitable metric for evaluating institutional designs.

In contemporary societies the unschooling approach to education questions societal norms about what counts as worthwhile knowledge, seeking to redefine the nature, meaning and purpose of education (Romero, 2018). It is difficult, or nearly impossible to regulate methods of education such as unschooling even now. In the future unschooling could well become the norm in policy frameworks for education.

Declarations

Clinical trial number

Not applicable.

Declarations

Ethics: The research for this paper was conducted after the study protocol (2028536-1) was exempted from IRB oversight by the Lehigh University IRB in accordance with appropriate national guidelines based on the Belmont Report in the USA. The study and

Consent to participate:

The participants in the focus group discussion gave their informed consent before discussing the topics for this study in accordance with the study protocol 2028536-1 under Lehigh University's IRB following the USA guidelines..

Consent to publish:

Not applicable. There is no identifying data involving human subjects.

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Author Contribution

ND developed the concepts, analyzed the future reports, conducted the focus groups and structured the writing, drafting 2 sections. IG gathered data and drafted three sections. All authors revised and reviewed the manuscript.

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Data Availability

The reports analyzed in this project are included in the manuscript.

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Footnotes

1. Western, Education, Industrialized, Rich, Democratic societies are psychologically distinct and are share traits and preferences that are rapidly being adopted by other societies as they are integrated into global markets (Henrich 2022).

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