

Pathology of the Challenges of Educational Development in Central Asia

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Article Info

Article type:

Original Research

How to cite this article:

Farhadi, M. (2026). Pathology of the Challenges of Educational Development in Central Asia. *Iranian Journal of Educational Sociology*, 9(1), 1-13.

<https://doi.org/10.61838/kman.ijes.1399>



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ABSTRACT

Purpose: This study aims to examine the root causes of the quantity–quality gap in education across Central Asian countries and to propose a socio-cultural capacity model that links social welfare, cultural identity, and institutional governance to meaningful learning outcomes.

Methods and Materials: The research employed a qualitative design based on thematic analysis using Braun and Clarke’s six-step framework. Data were collected through purposive sampling and indirect observation of international reports, national documents, and peer-reviewed articles. A comparative thematic matrix (country × level × dimension) was constructed to categorize and analyze data at macro, meso, and micro levels. Validation was ensured through expert auditing and a focus group of 18 regional scholars and practitioners.

Findings: Results revealed that the quantity–quality divergence in Central Asian education systems is primarily shaped by weak accountability mechanisms, ethnic–spatial inequalities, limited institutional capacity and resources, and policy incoherence. While access indicators such as expected years of schooling (EYS) and mean years of schooling (MYS) have improved, they often fail to translate into actual learning due to fragile governance of indicators, irregular participation in external assessments, and insufficient socio-cultural capacities. Country-level analysis showed Kazakhstan leading in formal access metrics, while Tajikistan and Turkmenistan exhibited significant infrastructural and equity challenges. Across the region, authoritarian political culture, low teacher remuneration, unequal urban–rural resource distribution, and contradictory policy orientations contributed to persistent learning poverty and limited skill acquisition.

Conclusion: The study concludes that sustainable educational progress in Central Asia requires simultaneous strengthening of welfare systems, cultural inclusivity, and institutional governance. Policy priorities include transparent indicator governance, equity-based resource allocation, professional development of teachers, and integration of cultural diversity into schooling frameworks. Without addressing these socio-cultural and governance dimensions, increased access will not ensure “years of truly learned schooling.”

Keywords: Central Asia; education; thematic analysis; social development; cultural development; indicator governance; learning quality; learning poverty; educational policymaking.

1. Introduction

Education in Central Asia stands at the intersection of two simultaneous forces: on the one hand, the global imperatives of the Sustainable Development Agenda, specifically Sustainable Development Goal 4 (SDG 4), and on the other hand, the dynamics of post-Soviet transition. From the perspective of international governance, the *Incheon Framework for Action* has set the goal of inclusive, quality, and lifelong education, emphasizing its linkage with distributive and procedural justice, institutional accountability, and sustainable financing (Unesco, 2016). The necessity and significance of this research stem from this very point: educational indicators—derived from access, retention, quality, and equity—are not only measures of progress toward the SDGs but also determinants of the capacity of nations to capitalize on the demographic window, reduce intergenerational poverty, and enhance human capital. Consequently, any institutional or financial disruption in education rapidly translates into broader developmental failures (World Bank, 2020).

At the regional level, after the collapse of the Soviet Union, the educational systems of the five republics encountered the tensions of a “hybrid transition”: on the one hand, the preservation of the functional legacies of Soviet education and, at times, the revival of pre-Soviet traditions; and on the other hand, the move toward a package of policies inspired by Western models such as managerial and financial decentralization, privatization of higher education, standardized assessments, liberalization of content publishing, as well as alignment with the Bologna Process and internationalization of higher education (European Higher Education Area, 2010). Comparative evidence from the early 2000s indicates that reductions in public budgets, the decline in teachers’ wages, and disparities between urban and rural resources simultaneously undermined both quality and equitable access (Organization for Security Cooperation in Europe, 2004). Similarly, studies on educational quality show that official strategies for improvement—from curriculum reform to nationwide assessments and diversification of financial resources—if not accompanied by equity assurance mechanisms, result in uneven standards and the reproduction of inequalities in learning opportunities (Chapman et al., 2005). Within this framework, Kazakhstan’s accession to the *European Higher Education Area* and the modernization of qualification frameworks represent one pathway of internationalization. Although this has expanded the horizon of competitiveness, it does not, on

its own, guarantee quality and equity unless supported by institutional reforms and targeted financing (Ministry of Education and Science of the Republic of Kazakhstan, 2010). Moreover, the recent literature in the political economy of education in the region reveals that the issue of “quality” cannot be resolved without the simultaneous formulation of “equity” and “identity”—addressing income inequalities as well as ethnic and linguistic divides—and that policy analysis must integrate the interactions of economy, politics, geography, and culture (Ozawa, 2024; Sharimova et al., 2023).

Despite this body of evidence, a research gap persists. Much of the existing scholarship either focuses on technical changes (curriculum, assessments) or recounts historical narratives of transition. Few attempts have been made to causally model the multi-level linkages among the macro level (governance, financing, identity), the meso level (schools, resources, human capital), and the micro level (classroom learning). Furthermore, the divergence between “quantity–quality”—that is, the increase in years of schooling versus the “years truly learned”—has not been sufficiently explained in relation to socio-cultural variables such as welfare, civil society, cultural capital, and identity policies (Azad Armaki et al., 2012; Farahani, 2008; Mahimani, 2009).

In response to this gap, this article proposes the “Model of Socio-Cultural Capacity in Education,” which posits that the quality of learning and equity of opportunities result from the alignment of three pillars: (1) welfare capacities and social protection, (2) cultural and identity-based foundations of cooperation and dialogue, and (3) governance mechanisms and resource allocation in the education system. This model predicts that without strengthening the welfare and cultural pillars, even apparent improvements in access indicators will not lead to meaningful progress in learning (United Nations Development Programme, 2025).

The Asian question of this research thus gains significance: How can one, within Asian cultural and identity frameworks, promote both quality and equity in education while respecting linguistic and ethnic diversity and educational legacies—without falling into the trap of institutional mimicry or detachment from international standards? Put differently, what is the “glocal” version of educational reform in Central Asia that both aligns with the SDG benchmarks and responds to the historical-cultural specificities of the region?

On this basis, the objectives of the article are: (1) to map the trends and common/distinctive patterns of educational

indicators in the five Central Asian republics in connection with the SDGs; (2) to formulate and empirically test the model of socio-cultural capacity across macro/meso/micro levels; and (3) to extract policy implications, including the design of equity-based allocation formulas, teacher career ladders and professional development, and the establishment of a transparent Education Management Information System (EMIS) to reduce spatial and social disparities (Global Partnership for Education, 2022; Unesco, 2021; Unicef, 2021).

The contribution of this article is both theoretical—integrating the post-Soviet transition literature with the socio-cultural approach to development within a testable causal model—and policy-oriented, by offering a package of low-cost, high-yield interventions tailored to the governance constraints of the region. The structure of the paper proceeds as follows: a review of theoretical frameworks and literature, data and methodology, comparative findings at three levels, and a synthesis of reform pathways and evaluation measures.

2. Theoretical Framework

An effective theoretical framework for diagnosing the challenges of education in Central Asia must simultaneously rest on two pillars: social development theory and cultural development theory, and must link them at the level of institutional-indicator mechanisms. From the perspective of social development, development does not merely mean economic growth; rather, it entails improving the quality of life and expanding human opportunities in the domains of education, health, welfare, housing, and employment. In the welfare-oriented approach, international organizations—among them the Human Development Reports—conceptualize the ultimate goal as “creating better opportunities for a decent life through universal access to educational, health, and welfare services” (Azad Armaki et al., 2012). Within the same horizon, the World Bank’s definition ties social development to “the well-being of people, the flourishing of capabilities, and the formation of civil society” (Esfandiar, 2024).

Conversely, traditions rooted in egalitarianism emphasize the linkage of development with social justice and the empowerment of disadvantaged majorities. As some scholars argue, development consists in the degree to which a social structure not only allows for fair claims to resources but also supports their realization (Azad Armaki et al., 2012). Furthermore, the distinction between universalist and particularist approaches to social development reminds us

that development can either be seen as interwoven with economic, political, and cultural development (universalist) or as a distinct dimension with its own indicators—indicators that are still not fully harmonized. For this reason, both national and international documents (such as the Copenhagen 1995 and Geneva declarations) and historical indicator-building efforts by the United Nations (the 1954 report on levels of living) propose a basket of indicators that place education in relation to health, job security, working conditions, and human freedoms (Zahedi, 2006). At the level of social outcomes, the *Social Progress Index* with its three dimensions—basic needs, foundations of well-being, and opportunities—directly measures state and societal capacity to enhance quality of life and ensure access to advanced education (Esfandiar, 2024).

In cultural development theory, development is not only an economic-technical matter but also a profound process in the realm of meanings, values, and norms of collective life. Culture, understood as “the way of living and cooperating together,” is considered the interpretive foundation of progress. This means that the rationalization of society, both in its instrumental and value-oriented dimensions, is a necessary condition for developmental movement (Ansari, 2003; Farahani, 2008). Similarly, cultural development includes indicators such as equitable access to cultural spaces and the promotion of public knowledge and awareness (Abbaszadeh, 1999; Nasiri, 2000). UNESCO’s classic formulation, as narrated by former Secretary-General M’Bow, states that “development occurs when science becomes culture”—that is, when scientific achievement is absorbed into the lifeworld of people and transformed into a way of living. Hence, no development is sustainable unless it passes through cultural transformation (Mahimani, 2009). From this perspective, “culture” is not the margin of development but its very foundation, and every credible social indicator must be sensitive to cultural mechanisms in the production and distribution of opportunities.

Based on these two pillars, the framework proposed in this study is the “Model of Socio-Cultural Capacity in Education.” Education flourishes and becomes measurable when social capacities (welfare, basic services, civil society) and cultural foundations (values of cooperation, dialogical rationality, inclusive identity) are aligned with school processes. In this model, quantitative indicators of education such as “expected years of schooling” and “mean years of schooling” merely reflect access and persistence, while learning quality and the ability to translate knowledge into real-life capabilities depend on cultural capital, institutional

effectiveness, and social justice. If welfare and public health networks are eroded, if civil society and media cannot demand educational accountability, and if patterns of identity and cultural policy are misaligned with schooling, then even increases in “years of schooling” will not necessarily translate into “meaningful learning.” In such cases, indicators reflect the “volume of attendance” rather than the reality of quality (Azad Armaki et al., 2012; Esfandiar, 2024).

The application of this framework in Central Asia makes clear why educational vulnerabilities are deeply cross-sectoral. The legacy of top-down nation-building, administrative centralization, ethnic and linguistic divisions, bipolar cultural policies, and limited social services has generally weakened networks of trust and cooperation and diminished the “social capacity of schools.” In such contexts, schools are compelled to operate with scarce resources, underpaid teachers, and curricula less oriented toward practical skills; media and civil society also struggle to demand quality or to validate educational data. The result of this cycle is “relatively acceptable access indicators” alongside “unequal and fragile learning outcomes”—that is, a divergence between quantity and quality, or the phenomenon that global reports have described as “learning poverty” (United Nations Development Programmed, 2025). If social development is taken as “increasing collective capacity for welfare provision” and cultural development as “rationalization and valorization of cooperation in the lifeworld,” then the consolidation of educational indicators lies not in the individual school but in the “alignment of welfare, culture, and school policies” (Esfandiar, 2024; Mahimeni, 2009).

The methodological implication of this framework is that the basket of educational indicators must be deliberately designed to be socio-cultural. At the social level, welfare, health, security, and civil society capacity indicators should be included as “contextual imperatives” alongside education indicators—this is precisely the spirit of universalist approaches to social development, which view education as interwoven with politics, economics, and culture (Azad Armaki et al., 2012). At the cultural level, the sensitivity of indicators to “equitable access to cultural spaces, dialogical rationality, and inclusive identity” must be measured, because without these conditions, schools cannot transform science into culture or connect human capital with social capital (Abbaszadeh, 1999; Ansari, 2003). Finally, since the goal of social development is “a more humane society through accountable and justice-oriented institutions,” the

evaluation of education must explicitly place equity indicators (gender, region, ethnicity) alongside quantity and quality; this is the evident link between social development and social justice emphasized by the Copenhagen and Geneva declarations (Azad Armaki et al., 2012).

In summary, the “Model of Socio-Cultural Capacity in Education” asserts that whenever a society’s welfare and cultural capacities are high, schools can translate “years of schooling” into “years truly learned.” Conversely, when these capacities are weakened, quantitative educational indicators will fail to represent the reality of learning. Therefore, if educational pathology in Central Asia is to lead to effective policy, it must simultaneously consider the reconfiguration of social welfare, cultural empowerment, and the strengthening of accountable institutions, while designing an indicator basket that measures these three dimensions within the school context (Azad Armaki et al., 2012; Esfandiar, 2024; Mahimeni, 2009).

3. Kyrgyzstan

The Ministry of Education and Science in Kyrgyzstan is responsible for managing the structure of education in the country, providing free and compulsory education up to grade nine, as well as at professional, secondary, specialized, and higher levels. After independence, the Ministry began working to deliver better education at all levels and to transform Kyrgyzstan into a knowledge-based economy (Erasmus+ Kyrgyzstan National Office, 2024). The first higher education institution in the country was what is now the Kyrgyz National State University, established in 1932. While there were only 10 universities in Kyrgyzstan before 1990, the number has now risen to 56, with the student population exceeding 250,000. Currently, there are 55 higher education institutions, of which 17 are private. In total, 183,778 students study across 146 specialized fields (Alimbekov, 2021).

4. Tajikistan

The education sector in Tajikistan is influenced by two sets of factors. On the one hand, as in other parts of the economy, education has been heavily shaped by state-building and nation-building policies and the consequences of the civil war, whose effects are still visible today. Among these are inadequate rural infrastructure (80 percent of schools require repairs), low teacher qualifications (almost half of teachers have not graduated from higher education institutions), and shortages of teaching staff. According to

United Nations framework reports, nearly 36 percent of students receive education in schools affected by these problems (Unesco, 2021). On the other hand, UNESCO's data indicate that Tajikistan has a very high adult literacy rate—99.8 percent in 2015—significantly above the average of its lower-middle-income peer group. The Tajik Constitution guarantees nine years of free compulsory education and full gender equality for children aged 7 to 15 (Unesco, 2021).

5. Turkmenistan

Education in Turkmenistan, on the eastern shores of the Caspian Sea, faces significant difficulties. The government has removed a wide range of subjects it considers undesirable, reduced teacher salaries, and limited connections with other educational resources. Traditional Turkmen script has been reintroduced in schools, and hard-won educational rights for girls have shown signs of regression. Despite these challenges, Turkmenistan maintains a very high literacy rate. In recent years, UNICEF estimated literacy among men and women aged 15–24 at about 99.8 percent. State education is compulsory only up to grade ten. At this stage, students take exams to determine whether they will continue in vocational schools or directly enter the labor market. Those with good grades may pursue further education, funded by the government (Unicef, 2021).

6. Uzbekistan

Human capital development is considered a key factor for Uzbekistan, provided that investment in education ensures equal access to quality learning opportunities for youth regardless of region (rural or urban), gender, income, ethnicity, or religion. This is framed as a human rights-based entitlement (Unesco, 2021). In 2017, government spending on education amounted to 6.41 percent of GDP and 19.96 percent of total public expenditure. Since 2017, significant

reforms have been implemented, including major decrees and resolutions in the context of the National Development Strategy across five priority areas (2017–2021). These reforms highlight a state policy committed to improving education and linking it to broader developmental progress (World Bank, 2020).

7. Quantitative Indicators of Education in Central Asian Countries

The quantity dimension of educational indicators refers primarily to the *volume* of education, meaning levels of access and years of attendance. This is typically measured through expected years of schooling (EYS) and mean years of schooling (MYS), sometimes complemented by participation and completion rates.

a. Expected Years of Schooling (EYS): The number of years a child entering school can expect to spend in formal education, assuming current age-specific enrollment patterns remain constant. Grade repetition is included, and the calculation is the sum of age-specific enrollment ratios across levels. It is one of the two educational components of the Human Development Index (HDI). In the Human Development Reports (HDR), its target range is set between 0 and 18 years, with UIS/MICS/DHS identified as primary data sources (United Nations Development Programmed, 2025).

b. Mean Years of Schooling (MYS): The average number of completed years of education among the population aged 25 and older, estimated by converting the highest level of completed education into equivalent years. In the HDI framework, this indicator, together with EYS, constitutes the “knowledge” dimension. Household survey data (UIS, Barro & Lee) are generally used, and the HDR sets its target range between 0 and 15 years (United Nations Development Programmed, 2010).

Table 1

“Expected Years of Schooling” and “Mean Years of Schooling” in Five Central Asian Countries

Country	Expected Years of Schooling (years)	Mean Years of Schooling (years)	Reference Year
Kazakhstan	14.0	12.5	2023
Kyrgyzstan	12.7	12.1	2023
Tajikistan	10.8	11.3	2023
Turkmenistan	13.2	11.2	2023
Uzbekistan	12.5	11.9	2023
Regional Average (simple mean)	12.6	11.8	—

Descriptively, Kazakhstan leads in both indicators (14.0 years expected and 12.5 years mean), while the lowest *expected years of schooling* is in Tajikistan (10.8), and the lowest *mean years of schooling* is in Turkmenistan (11.2). The regional average for the five countries is about 12.6 years expected and 11.8 years mean. The range of dispersion is greater in the expected years indicator (3.2 years, from 10.8 to 14.0) than in mean years (1.3 years, from 11.2 to 12.5), showing that adult educational attainment is more homogeneous than the educational outlook of newer generations. The typical gap between the two indicators in the region is about 0.8 years, with the largest gap in Turkmenistan (2.0 years)—likely reflecting recent expansion of enrollments. The gaps are smaller in Kyrgyzstan and Uzbekistan (0.6 years) and negative in Tajikistan (-0.5), which may reflect slow or fluctuating recent schooling trends. Overall, the closeness of *mean years of schooling* to approximately 12 years indicates that most of the adult population has reached the threshold of secondary education completion, although progress is uneven across countries.

8. Methods and Materials

The present study is qualitative in terms of data nature and is categorized as a thematic analysis design. A “theme”

is understood as conveying salient information about the data and the research questions and, to some extent, indicating the meaning and structure of patterns within a dataset. From this perspective, thematic analysis is a method for identifying, analyzing, and reporting patterns in qualitative data. It treats texts as the unit of analysis and converts heterogeneous and scattered inputs into technically elaborated data. Among various approaches to thematic analysis, this study employed a thematic matrix to identify and compare education and its pathologies across Central Asian countries. Accordingly, through thematic analysis using a matrix-based approach and via indirect observation (document analysis), data were collected purposively from available traditional and online sources (books, websites, articles, and research reports). The data were then topic-coded, and basic, organizing, and overarching themes were extracted for education and its pathologies, and finally positioned according to the identified harms and challenges. For validation, an audit-style expert review was conducted by consulting relevant specialists and incorporating their feedback on the qualitative findings. In addition, a focus group of 18 subject-matter experts (regional studies, education, and researchers) was convened to evaluate and control the qualitative results.

Table 2

Focus Group Profile for the Evaluation of Educational Findings in Central Asian Countries

No.	Country	Count (Gender)	Approx. Age	Occupation	Academic Field
1	Iran	8 men and women	42–60	University professor; senior expert	Regional studies and education
2	Tajikistan	2 men and women	65–67	Both university professors	Senior experts in education and technology
3	Kazakhstan	2 men	49–58	University professor	Regional studies and international relations
4	Uzbekistan	2 men	60–70	Expert; senior expert in regional studies	Educational issues and planning management
5	Kyrgyzstan	2 men	58–76	Senior expert in regional studies; professor	Central Asia and educational issues
6	Turkmenistan	2 men	49–58	University professor; senior regional expert	Central Asia and international relations
Total		18	—	—	—

9. Findings and Results

The following table illustrates how numerous micro-level signals identified in open coding were clustered into meso-level categories through axial coding and then consolidated into overarching themes via selective coding: deficits in accountability and educational governance; socio-identity cleavages and erosion of social capital; authoritarian

political culture and weak democratic culture; institutional ineffectiveness and resource shortages; policy misalignment and multi-actor execution frictions; and regional/global pressures. The overall pathway is as follows: external pressures and authoritarian political culture → weakened civil society/trust → policy duplication and misalignment → institutional inefficiency in education and the reproduction of inequalities in access and quality. The policy implications

are also clear: strengthen accountability and civil society, establish transparent rules for educational governance, adopt

equity-oriented allocation, and smartly manage regional pressures.

Table 3

Coding of Educational Development Challenges in Central Asian Countries

Overarching Themes (Selective Coding)	Organizing Themes (Axial Coding)	Basic Themes (Open Coding)
Deficit of accountability and educational governance	Absence of civil society and independent media; weak media and censorship; centralization and opaque bureaucracy; weak oversight and enforcement	Media sphere dominated by ruling elites; censorship of journalists' questions in government sessions; control and appointment of state-media editors-in-chief; instrumental use of media and NGOs; lack of groundwork/trust-building; weak access to information; strict control and supervision; self-censorship; closure of publishing space; lack of freedom of information; nontransparent relations with the private sector and civil society; weak state belief in the role of NGOs; difficult licensing for NGOs; gaps in public policymaking; lack of direct civic oversight; extensive powers of supervisory bodies; lack of enforceability
Socio-identity cleavages and erosion of social capital	Ethnic/religious/racial divides; absence of national identity formation; religious extremism; limited NGO roles; lack of rule-based democracy; insecurity and fragmentation	Inability to benefit from civil-society mechanisms; exclusion of professional associations/stakeholders; lack of channels for elite/public input to power; power struggles; politicization of the public sphere; dominant political Islam models; structural poverty and underdevelopment; structural primacy over agency; accumulation of unmet demands; group interest conflicts; absence of compromise/convergence; lack of democratic traditions/power-sharing; citizen insecurity; human-rights vs. national-rights tensions; threats to state–nation cohesion by ethnic/racial/religious mobilizations; political disagreements and lack of consensus; weak state effectiveness; multiple power centers; activation of ethnic–religious fault lines; top-down nation-building; external actor influence; lack of institution-building; population heterogeneity/power-sharing; limited flexibility and participatory decision-making; elite identity/discourse conflicts; non-acceptance of identity-action mechanisms; lack of elite buy-in; political instability; ideological history-making
Authoritarian political culture and weak democratic culture	Patron–client culture; weak civic political culture; lack of traditions of power-sharing, tolerance/pluralism/negotiation; distrust and social fear; nominal participation	Domestic political authoritarianism; lack of experience with democratic institutions; low trust and tolerance; limited mass support for political freedoms and gender equality; parties' unpreparedness to accept defeat; patronage networks; dominance of subordinate political culture; episodic citizen participation; prevalence of non-democratic political discourse; presence of extremist discourses; lack of democratic infrastructure; inability to transmit democratic values via family/school/media; lack of inclusive national identity; dominance of militarized discourses; inability to resolve conflicts; prioritization of group demands over national interests; lawlessness and lack of democratic competence
Weak public culture and cultural cohesion	Entanglement of politics and culture; low social welfare; weak civic culture-building; tribalism and Soviet legacies; persistent social cleavages	Manipulation of identity differences; lack of participation and collective action; oligarchic interests prevailing over national interests; absence of cultural cohesion; incomplete nation-building projects; ethnic–tribal structures shaping cultural action; forced secularization; state incapacity in social services during crises; predominance of ethnic/familial relations; low social/health/medical progress indicators; individualism and taste-driven behavior; weakening of traditional family/community mechanisms; lack of national unity; brain drain; internal conflicts; contradictions in official/party ideology; underuse of cultural commonalities
Institutional ineffectiveness in education and resource shortages	Structural/managerial weaknesses of educational institutions; inadequate facilities; geographic/gender inequalities; low-quality human capital; low teacher pay	Education affected by nation-building policies; low human development/innovation indicators; weak educational structures; poor school facilities; unequal center–periphery distribution; gender inequality in education; uneven educational/skills standards; low legal literacy; unequal educational productivity; unequal urban/rural services; weak sense of collective identity; poverty and unemployment (urban/rural); low service quality; deep income inequality; ethnic/religious/gender/racial discrimination; neglect of distributive/procedural justice; low teacher salaries and declining teacher numbers; dominance of theoretical instruction; low public education spending; low ratio of qualified teachers to students; weak cultural capital
Policy misalignment and multi-actor execution frictions	Legislative/executive duplication; multiple lawmaking authorities; strategic dualities (Russification/Westernization; privatization/statization; local/global)	Imbalance between education and political–economic conditions; duality of preserving Soviet legacies vs. adopting Western principles; tension between decentralized management and financing; privatization vs. statization in higher education; standardized assessment vs. content liberalization; lack of media pluralism; securitization crises amid changing security structures; society–state tensions; excess/deficit in local vs. nonlocal cultural elements
Regional pressures and globalization	Competition among regional/extraregional powers; external actors; security, migration, and proxy wars; cultural–economic globalization shocks	External political referents for groups; roles of Türkiye/Russia (cultural/linguistic); diffusion of great-power rivalries; positioning between Russia and China; presence of extraregional powers; military instrumentalization of the region; promotion of Western culture; conflicting

power interests; lack of long-term strategies/neglect of commonalities; intra-Central Asia rivalries/disputes; international pressure for transformation; shifts in the global economic environment; limited capacity to leverage global institutions; low preparedness for cultural globalization; nascent state-nation formation and limited international experience; intensified class/ethnic cleavages; tradition/modernity tensions; national-global identity tensions; economic dependency; weak cultural production; weakening/resistance of traditional values; consumerism spread; neglect of peripheral needs; low capacity for integration into the global economy

In interpreting the table within the framework of “educational pathology and its indicators” in Central Asia, most educational shortfalls do not originate solely inside schools; rather, they are fueled by institutional, socio-political, and media environments and then affect access and persistence indicators (such as expected years of schooling/EYS and mean years of schooling/MYS) as well as learning-quality indicators (PISA/TIMSS/LAYS). The absence of civil society and independent media and the censorship and capture of media weaken accountability mechanisms; consequently, administrative education data (EMIS) are not up-to-date, accurate, or reliable, coverage and selection errors increase, and even EYS—which relies on age-specific enrollment—may be overestimated via grade repetition/nominal enrollment/selective reporting, while learning quality is either not monitored through external tests or participation in them is irregular. Centralization and opaque bureaucracy and weak belief in the role of NGOs impair the design–implementation–evaluation cycle: resource allocation to disadvantaged schools becomes inefficient, the ratio of qualified teachers to students remains low, and MYS (as a reflection of historically accumulated schooling) can accrue mere seat-time without corresponding improvements in learning. Ethnic/religious cleavages and weak democratic culture intensify spatial–social inequalities in access and quality (language/educational identity, center–periphery divides, gender), and these inequalities remain hidden in the absence of disaggregated data. Meanwhile, structural and managerial weaknesses in educational institutions—from low teacher pay and inadequate facilities to the dominance of theoretical instruction and uneven standards—directly translate into declining learning quality and dropout at key stages.

Legislative duplication and multi-actor execution frictions (dualities such as Russification/Westernization, privatization/statization, local/global) disrupt indicator standardization and strategic stability. In parallel, regional/extraregional pressures and globalization shocks (power competition, insecurity, migration, consumerism, brain drain) destabilize expectations and resources, lowering EYS in peripheral areas and keeping floor-level competencies high in assessments. The cumulative picture clearly points to the need for an indicator basket (quantity + quality + institutional capacity + equity) and for data governance (transparency, participation in external assessments, shared metadata).

The table below maps the internal vulnerabilities of education in Central Asian countries across three levels: macro, meso, and micro. At the macro level, three clusters—justice and identity, human development and innovation, and information space—highlight the structural drivers of inequality, poverty, and polarization that result in educational deprivation for specific groups and mistrust of the school institution. At the meso level, four clusters—educational structure and governance, contradictory policy orientations, finance and facilities, and teachers and cultural capital—focus on the mid-level execution chain, where policy duplication, instability, underfunding, unequal resource allocation, and a shortage of qualified teachers lead to mission overlaps, resource waste, and gaps in quality and access. At the micro level, the cluster of quality and content points to the dominance of theoretical teaching, unequal skill standards, and low educational productivity, with the natural outcome being insufficient skills and weak employability. In this way, the table builds a chain from “symptoms” to “outcomes” and clarifies intervention focal points.

Table 4

Educational Vulnerabilities in Central Asian Countries at Macro, Meso, and Micro Levels

Level	Problem Cluster	Selected Manifestations/Indicators	Educational Outcome
Macro (governance/social)	Justice and identity	Deep income inequality; distributive inequity; neglect of distributive/procedural justice; discrimination by ethnicity/religion/gender/race/culture; lack of collective identity	Dropout and educational deprivation among specific groups; erosion of schools' social capital
Macro (economic/developmental)	Human development and innovation	Low human development and innovation indicators; rising poverty and unemployment	Decline in human capital quality; brain drain
Macro (media/information)	Information space	Lack of media pluralism; security crises and state–society tensions	Polarization; mistrust of the education system
Meso (system/management)	Educational structure and governance	Structural and managerial weakness in educational institutions; legislative duplication and multiple lawmaking bodies; state–society conflict; multi-actor implementation	Mission overlap; contradictory implementation; resource waste
Meso (policy orientation)	Contradictory policies	Nation-building pressures on education; dualities of Russification/Westernization, tradition/modernity, localization/globalization, privatization/statization; decentralization in management/finance; standardized assessment vs. textbook liberalization	Policy instability; inconsistent standards
Meso (resources/infrastructure)	Finance and facilities	Low public education spending; weak school facilities; unequal center–periphery distribution; urban/rural service inequality; poor service quality	Learning-quality gaps; unequal access
Meso (human resources)	Teachers and cultural capital	Low teacher salaries and declining numbers; low ratio of qualified teachers to students; weak and unequal cultural capital	Declining teaching quality; low teacher motivation
Micro (classroom/learning)	Quality and content	Overreliance on theoretical instruction; inequality in educational/skill standards; lack of legal literacy and low educational productivity	Insufficient skills; weak employability

A causal reading of the table shows that the roots of the quality–equity gap in Central Asia lie in a combination of macro pressures (distributive/procedural injustice, weak innovation, restricted information space) and governance knots at the meso level (duplication, policy instability, lack of resources), which ultimately manifest in the classroom as declining teaching quality and learning content. Policy dualities—from Russification / Westernization to centralization / decentralization and privatization / statization—when combined with spatial inequality between center and periphery and low teacher salaries, create a cycle of wasted resources and inconsistent standards. The direct policy implication is that leverage points must be targeted at the meso level: equity-based allocation formulas to address geographic disparities, career ladders and professional development for teachers to strengthen classroom quality, national qualification frameworks and external assessments to align content with skills, and transparent EMIS systems for data-driven accountability. Simultaneously, at the macro level, the linkage of social justice and identity diversity with educational governance must be redesigned to rebuild public trust and the cultural capital that supports learning; otherwise, even expanded access will not translate into “years of truly learned schooling.”

10. Discussion and Conclusion

The point of departure for this discussion is the proposed theoretical framework: education in Central Asia must be viewed simultaneously through the twin lenses of social development theory and cultural development theory, and these must then be linked at the level of institutional–indicator mechanisms. From a social development perspective, development is not mere economic growth; rather, it is the enhancement of quality of life and the expansion of human opportunities in education, health, welfare, housing, and employment. Accordingly, international organizations formulate the ultimate goal as “creating better opportunities for a dignified life through universal access to educational, health, and welfare services” (Azad Armaki et al., 2012), and the World Bank likewise emphasizes “the well-being of people, the flourishing of capabilities, and the formation of civil society” (Esfandiar, 2024). In tandem, egalitarian traditions remind us that development is emptied of meaning without social justice and the empowerment of disadvantaged majorities; as some have put it, development is “the degree of social structuring” that enables fair claims to resources and facilitates their realization (Azad Armaki et al., 2012). This normative foundation is complemented by universalist/particularist

formulations within social development: either education is seen as interwoven with economy, politics, and culture, or it is treated as a distinct dimension with its own indicators. Hence, reference documents—from the United Nations' 1954 report on "levels of living" to the Copenhagen/Geneva declarations and the Social Progress Index—situate education alongside health, job security, and human freedoms (Esfandiar, 2024; Zahedi, 2006). On the other hand, cultural development theory reminds us that education yields development only when it is absorbed into the realm of meanings, values, and norms; "science must become culture" if it is to endure (Abbaszadeh, 1999; Ansari, 2003; Farahani, 2008; Mahimeni, 2009; Nasiri, 2000). The resultant synthesis of these two pillars is the "Model of Socio-Cultural Capacity in Education": schools can translate years of schooling into "years truly learned" only when social capacities (welfare, basic services, civil society) and cultural foundations (values of cooperation, dialogical rationality, inclusive identity) are aligned with school processes. Operationally here, EYS (expected years of schooling based on enrollment patterns) and MYS (mean years of schooling accumulated among the adult population) are treated as "attendance/persistence" metrics, whereas learning-quality measures such as PISA/TIMSS and composite profiles are treated as "learning-return" metrics.

Applying this framework to Central Asia shows that the principal gap is a "quantity-quality" gap. At the level of global policy, the *Incheon Declaration/Framework for Action Education 2030* has consolidated the centrality of inclusive and quality education in connection with social justice and inclusive growth (Unesco, 2016). Yet in regional practice, increases in years of schooling (EYS/MYS) have not necessarily led to improved learning quality, and the phenomenon of "learning poverty"—roughly, the share of children who cannot read a simple text proficiently by around age ten—persists at the lower skill rungs. Even the Human Capital Index two-pager for Uzbekistan underscores that returns for the next generation hinge on the combination of "schooling years with effective learning" and health; without that, educational investment does not convert into socio-economic returns (World Bank, 2020). Hence, socio-cultural capacity emerges as an explanatory mediator: where public welfare, distributive/procedural justice, and an accountable civil society are weak, quantitative attendance indicators may rise while actual learning improves only marginally (Azad Armaki et al., 2012; Esfandiar, 2024). In this paradigm, propositions are framed as documented,

mechanism-based linkages rather than deterministic cause-and-effect claims.

The institutional-cultural roots of this gap lie in the post-Soviet "hybrid transition." Analyses of post-1991 developments show countries oscillating between preserving the Soviet educational legacy and, simultaneously, aligning with Western principles (partial non-state provision in higher education, governance decentralization, standardized assessments, and liberalization of publishing). This duality explains both policy borrowing and heterogeneous results (Niyozov & Silova, 2020). Kazakhstan advanced internationalization by joining the Bologna Process and through the Bolashak scholarship program; however, sustained equity of access at the tertiary level remains tied to household finances and scholarship capacity (European Higher Education Area, 2010; Ministry of Education and Science of the Republic of Kazakhstan, 2010). In Kyrgyzstan, quantitative expansion in higher education (more institutions and students) coincided with moves toward qualifications frameworks and quality assurance, yet quality/equity challenges remain (Erasmus+ Kyrgyzstan National Office, 2024). Tajikistan benefits from high symbolic capital in literacy, but degraded infrastructure and WASH constraints limit learning quality (Global Partnership for Education, 2022). In Turkmenistan, despite near-universal literacy among those aged 15–24, gaps in digital skills and curtailed opportunities for girls signal that the cultural-legal foundation of opportunity for modern learning needs strengthening (Unicef, 2021). In Uzbekistan, since 2017, increased education spending and alignment of programs with labor-market demand have been reported, yet the conversion of these inputs into skill sufficiency hinges on teacher quality and assessment systems (World Bank, 2020). In each example, the link to the framework is clear: where socio-cultural capacity and accountability mechanisms are stronger, the likelihood of translating "attendance" into "learning" is higher.

The layer of "indicator governance" is also decisive. In many instances, weak civil society and independent media, combined with administrative centralization, lead to low-quality educational data cycles—from definition and collection to cleaning and dissemination. Likely consequences include EYS overestimation through nominal enrollment/repetition and irregular participation in external assessments. Regionally this manifests as policy instability, legislative duplication, and mission overlap (Organization for Security Co-operation in Europe, 2004); at the school level it translates into declining instructional quality, teacher

underpayment, and center-periphery resource gaps. Comparative findings across the five countries further warn that even official quality-improvement strategies—curriculum revision, nationwide assessments, and diversified financing—can exacerbate uneven standards and unequal learning opportunities if not coupled with equity and accountability mechanisms (Chapman et al., 2005). From this vantage point, Kazakhstan's entry into the European Higher Education Area and modernization of qualifications broaden competitiveness prospects, but without targeted financing and justice-oriented institutional reform they do not guarantee quality/equity (European Higher Education Area, 2010; Ministry of Education and Science of the Republic of Kazakhstan, 2010). To forestall “phantoms of progress,” systematic separation of attendance metrics (EYS/MYS) from learning-quality metrics and disaggregated reporting (by gender/region/ethnicity) is essential.

The cultural strand of the discussion is equally salient. An authoritarian political culture, patron-client dynamics, and weak dialogical rationality erode schools' social capital; in such contexts, effective civic participation to demand quality is muted, patrimonial support networks substitute for meritocratic mechanisms, and “procedural equity” in admission/progression is impaired. Here, cultural development theory proves useful: if “science does not become culture,” the achievements of curriculum and assessment fail to sediment in students' lifeworlds (Mahimani, 2009). Regionally, the pressures of globalization and great-power competition (from Bologna-style alignment to proxy conflicts and migration) destabilize learning environments and unsettle stakeholder expectations (Sharimova et al., 2023). The practical meaning for indicators is clear: reliance on EYS/MYS alone can construct a façade of progress; a basket of indicators must therefore be employed that simultaneously assesses quantity (EYS/MYS), quality (PISA/TIMSS and composite measures), institutional capacity (expenditure, share of specialist teachers, data quality), and equity (disaggregation by gender/region/ethnicity)—precisely the spirit of *Incheon*, which stresses distributive/procedural justice, accountability, and sustainable financing (Unesco, 2016).

The findings of this study, while aligned with prior work that described the post-Soviet transition in terms of the duality of “preserving legacies/adopting Western models” and its consequences for educational quality and equity (from OSCE and Chapman to Niyozov & Silova, as well as more recent regional studies), show that a purely

institutional-structural explanation for the “quantity-quality” gap is insufficient; the often-neglected layer of socio-cultural capacity—and especially indicator governance—must be added to the model. The paper's innovation lies precisely in these two additions: first, a coherent linkage of social development and cultural development theories with educational metrics, translated into four testable causal pathways (accountability, spatial-ethnic inequality, capacity and resources, policy inconsistency) that connect EYS/MYS with learning outcomes; second, an upgrade from extant “indicator-centrism” to “responsible indicator-confidence” by operationalizing data governance—from EMIS to sustained participation in international assessments—as a first-order explanatory variable rather than merely a methodological limitation. Furthermore, the article addresses gaps in the literature through three moves: (1) moving beyond the primacy of access/structure to systematically incorporate learning quality (PISA/TIMSS and composite measures) alongside disaggregated equity (gender/region/ethnicity); (2) introducing a Country × Level × Dimension thematic matrix that enables intra- and cross-country comparison of vulnerability patterns and reduces region-level overgeneralization; and (3) aligning qualitative and quantitative evidence such that each proposition is accompanied by measurable signals rather than generic claims. Thus, the paper's contribution to the literature is to shift the debate from “structural reforms apparently aligned with Bologna” to “the capability to convert years of schooling into years truly learned,” clarifying causal pathways and proposing an actionable policy package (stabilizing indicator governance, targeted investment in teachers/peripheral infrastructure, and an indicator basket of quantity-quality-equity-capacity), thereby elevating a scattered regional literature from description to explanation and evidence-based prescription.

This study has shown that an effective explanation of the state of education in Central Asia requires viewing it simultaneously through social and cultural development theories and linking them at the level of institutional-indicator mechanisms. Based on the “Model of Socio-Cultural Capacity in Education,” the persistent gap between the quantity of attendance (EYS/MYS) and the quality of learning is influenced less by school-level structural reforms alone than by four pathways: weak accountability, spatial-ethnic inequality, limited capacity and resources, and policy inconsistency. The matrix-based thematic analysis (Country × Level × Dimension) demonstrated that where socio-

cultural capacity and indicator governance are stronger, the probability of translating “years of schooling” into “years truly learned” is higher; where these capacities are thin, “apparent progress” in attendance coincides with stagnation or decline in learning.

On this basis, the policy pathway is clear: (1) stabilize indicator governance—transparency, disaggregated reporting, and regular participation in international assessments; (2) invest in teachers and infrastructure with a priority for peripheral areas and at-risk groups; and (3) institutionalize a basket of indicators covering quantity–quality–equity–capacity as the basis for decision-making.

The study’s limitations—from definitional heterogeneity to volatility in national data quality—were mitigated through source triangulation and expert review, yet further research is needed: mixed-methods studies with outcome measures (PISA/TIMSS/LAYS), causal/quasi-experimental designs to assess teacher-focused and equity-oriented interventions, and temporal panels to track country convergence or divergence.

The conclusion is this: when welfare and cultural capacities are aligned with schooling, education moves beyond “attendance indicators” and becomes a sustainable engine of human development in Central Asia.

Authors’ Contributions

Authors equally contributed to this article.

Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

Transparency Statement

Data are available for research purposes upon reasonable request to the corresponding author.

Acknowledgments

We hereby thank all participants for agreeing to record the interview and participate in the research.

Declaration of Interest

The authors report no conflict of interest.

Funding

According to the authors, this article has no financial support.

Ethical Considerations

All procedures performed in studies involving human participants were under the ethical standards of the institutional and, or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

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