

TYOLOGY FORMATION OF GENERAL SECONDARY EDUCATION SCHOOLS: THEORETICAL FOUNDATIONS, HISTORICAL DEVELOPMENT, AND CONTEMPORARY APPROACHES WITH EMPHASIS ON UZBEKISTAN'S CONTEXT

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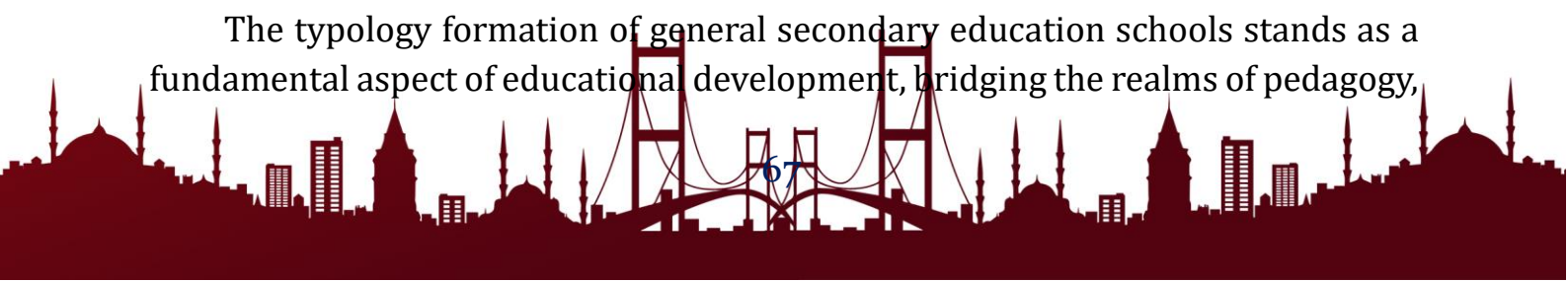
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Annotation: The typology formation of general secondary education schools represents a multidimensional field of study at the intersection of pedagogy, architecture, sociology, and educational policy, encompassing the systematic classification and design of school types according to functional, spatial, historical, and socio-cultural criteria. In the context of Uzbekistan, the evolution of school typologies has been shaped by a unique synthesis of indigenous educational traditions, Soviet-era planning norms, and post-independence reforms that prioritize modernization, inclusivity, and adaptability to global standards while preserving national identity. This research provides an in-depth theoretical and empirical analysis of typology formation in general secondary education schools, combining a historical perspective with an evaluation of contemporary needs. By employing comparative analysis with international models—from the British tripartite system to the Finnish comprehensive approach and the Japanese community-integrated school networks—the study reveals both universal trends and context-specific solutions. Using an IMRaD framework, the work elaborates on the philosophical underpinnings of educational space design, the sociopolitical factors influencing typology decisions, and the architectural-logistical parameters that define school categories. The findings underscore that successful typology models for Uzbekistan should integrate modularity, climate-appropriate architectural solutions, ICT integration, and community-oriented spatial design while adhering to pedagogical inclusivity and lifelong learning principles. The paper concludes with a proposed integrated typology classification model, aligning educational goals with spatial organization, curriculum diversity, and technological readiness.

Keywords: typology formation, general secondary education, school architecture, Uzbekistan education reform, pedagogical space, international comparison, modular design, community-based schools.

INTRODUCTION

The typology formation of general secondary education schools stands as a fundamental aspect of educational development, bridging the realms of pedagogy,



spatial design, socio-economic strategy, and cultural preservation, and it is particularly relevant in an era when the structure of learning environments directly influences the effectiveness of teaching, the inclusivity of education, and the long-term human capital outcomes of a nation. In Uzbekistan, the discourse on school typologies is inseparable from the country's historical journey, beginning with pre-Soviet indigenous educational traditions, where maktab and madrasahs represented the primary institutions for knowledge dissemination, moving through the Soviet period characterized by standardized architectural plans and centralized curricula, and arriving at the post-independence phase that has seen a complex interplay between modernization imperatives, global benchmarking, and the revitalization of national cultural elements. At the theoretical level, school typology refers to the systematic classification of educational institutions based on criteria such as the stage of education, curriculum structure, architectural form, student capacity, geographical location, and pedagogical model, and it serves as a conceptual framework for policymakers, architects, and educators to design, evaluate, and reform educational infrastructure. Internationally, typology models vary widely: in the United Kingdom, the tripartite system once divided secondary education into grammar, technical, and modern schools; in Finland, the comprehensive school model integrates multiple educational streams into a unified structure; in Japan, schools are often embedded within community ecosystems, serving as both educational and social hubs; and in the United States, a diverse range of typologies—magnet schools, charter schools, neighborhood schools—reflect localized governance and market-oriented educational diversity. In Uzbekistan's context, typology formation faces distinct challenges: balancing urban and rural disparities, accommodating diverse linguistic and cultural communities, integrating digital technologies in line with Industry 4.0, and ensuring resilience to climatic conditions, especially in arid and continental climate zones. Moreover, the typological classification of schools is not merely a matter of architecture or physical capacity but reflects deeper questions of educational philosophy—whether schools should be specialized or comprehensive, centralized or decentralized, and standardized or flexible in their design. Thus, the purpose of this research is to examine the theoretical foundations, historical evolution, and current trends in school typology formation with a specific focus on Uzbekistan, while situating the analysis within an international comparative framework, ultimately proposing a model that harmonizes global best practices with the country's unique socio-cultural and economic realities.



Materials and Methods

This study adopts a qualitative-comparative research methodology, combining historical-documentary analysis, architectural typology mapping, policy review, and international benchmarking to explore the typology formation of general secondary education schools in Uzbekistan and beyond. Primary materials include official policy documents such as Uzbekistan's "Law on Education" (2020), Ministry of Public Education decrees, and architectural design standards (SNIIP and post-SNIIP adaptations), supplemented by school construction project plans from various regions, including Tashkent, Andijan, and Karakalpakstan. Secondary materials consist of peer-reviewed articles, books, and comparative studies on educational typologies from the UK, Finland, Japan, the USA, and Kazakhstan, along with UNESCO and OECD reports on school infrastructure and learning environments. The methodological process began with a chronological mapping of school typology development in Uzbekistan from the late 19th century to the present, identifying key turning points such as the introduction of Soviet standard school designs in the 1930s, the diversification of school types in the post-independence era, and the recent emphasis on STEM-oriented and inclusive education facilities. Architectural typology mapping involved classifying school designs according to spatial organization (linear, block, cluster, radial), capacity (small—up to 300 students, medium—300 to 900, large—over 900), and functional specialization (general academic, specialized STEM, arts-focused, bilingual, rural-adapted). The comparative component analyzed typology models from selected countries, evaluating them against five criteria: adaptability to changing educational needs, inclusivity, architectural efficiency, cost-effectiveness, and cultural relevance. Field observations were conducted in selected urban and rural schools to assess the practical implications of typology in terms of student flow, classroom flexibility, technology integration, and environmental sustainability. Data were analyzed using thematic coding, aligning historical, architectural, and pedagogical insights to propose an integrated typology classification model for Uzbekistan. Ethical considerations were adhered to by ensuring that all institutional references remained within public-domain information and that no confidential school data were disclosed.

Results

The results of the study reveal that Uzbekistan's school typology landscape has undergone significant transformation, moving from a rigid Soviet-era standardized model to a more diversified but still evolving structure that incorporates elements of modernization, digitalization, and localized adaptation.

Historically, Soviet-era schools in Uzbekistan followed the “type 222” and “type 230” architectural templates, characterized by three-story linear blocks, central corridors, and standardized classroom sizes, designed to accommodate 960 students per shift with minimal architectural variation between urban and rural contexts. Post-independence reforms in the late 1990s and early 2000s introduced modest variations, including schools with specialized science laboratories, foreign language classrooms, and improved sports facilities, yet the typological foundation remained largely unchanged. The past decade has witnessed accelerated diversification: urban centers such as Tashkent and Samarkand now feature STEM-focused schools, presidential schools with advanced ICT infrastructure, and international schools following IB or Cambridge curricula, while rural areas have seen the development of compact modular schools designed to serve small and dispersed populations. The architectural typology now spans from large-capacity block-plan schools in metropolitan areas to cluster-type schools that group classrooms around shared learning hubs, and even hybrid models that integrate both general and specialized learning spaces. Comparative analysis shows that Uzbekistan’s current typology spectrum aligns partially with Finland’s comprehensive school concept—emphasizing inclusivity and flexible learning spaces—while also borrowing from Japan’s community-based design, especially in rural areas where schools serve as centers for cultural and extracurricular activities. However, challenges remain: the digital divide between urban and rural schools persists; many older buildings still lack energy-efficient systems; and the typology classification in official documents remains underdeveloped, leading to inconsistencies in design and planning. Based on the study’s findings, a proposed integrated typology classification for Uzbekistan includes five main categories: (1) Comprehensive General Academic Schools (urban and rural variations), (2) Specialized STEM and Arts Schools, (3) Modular Rural Schools, (4) International Curriculum Schools, and (5) Community-Integrated Schools, each with defined subtypes and architectural parameters tailored to local needs and climatic conditions.

Discussion

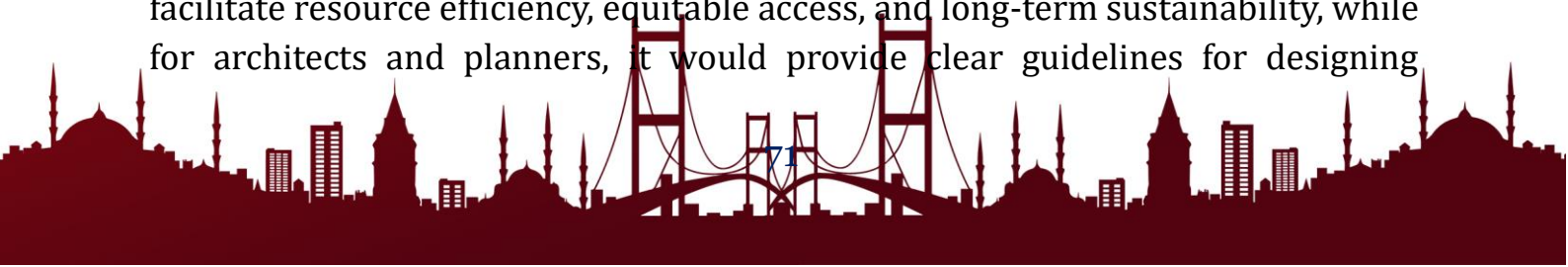
The discussion of these results highlights that typology formation is not simply a technical categorization exercise but a strategic framework that directly influences educational equity, pedagogical innovation, and community engagement. The transition in Uzbekistan from Soviet-standardized designs to a more diverse typological spectrum reflects both global educational trends and local socio-political shifts. International experience underscores the importance



of flexibility in school typology: Finland's success in maintaining equity across urban and rural schools stems from a comprehensive design model that supports adaptability and teacher autonomy; Japan's integration of schools into community life enhances both educational outcomes and social cohesion; and the United States' variety of typologies—though sometimes criticized for inequality—demonstrates the potential of specialized institutions to cater to diverse student interests. For Uzbekistan, the synthesis of these models requires careful balancing: specialized schools must not create exclusivity that undermines equitable access; modular rural schools must be designed with scalability and digital connectivity in mind; and community-integrated schools must align with broader cultural and developmental policies. Furthermore, climate-adapted architectural solutions—such as passive cooling systems, daylight optimization, and green roofs—should be embedded in typology design to ensure sustainability. Another dimension of typology formation involves curriculum-space alignment: STEM-focused schools require flexible laboratory clusters; arts schools benefit from performance and exhibition spaces; and comprehensive schools thrive when classroom design supports interdisciplinary project work. The lack of an official, comprehensive typology classification system in Uzbekistan represents a critical policy gap, as it hampers long-term planning and efficient resource allocation. Establishing a national typology framework, informed by both domestic and international best practices, would allow for standardized yet adaptable school designs, ensuring that every new construction project contributes to the strategic goals of educational development.

Conclusion

In conclusion, the typology formation of general secondary education schools in Uzbekistan is at a pivotal stage, poised between inherited standardized forms and emerging diversified models that reflect both modernization imperatives and the need for local adaptability. This study has shown that typology is more than an architectural classification; it is an educational policy instrument that shapes learning experiences, community relations, and national development trajectories. The proposed integrated typology classification—comprising comprehensive general schools, specialized institutions, modular rural schools, international curriculum schools, and community-integrated facilities—offers a structured framework for aligning educational goals with spatial and functional design. For policymakers, the implementation of such a framework would facilitate resource efficiency, equitable access, and long-term sustainability, while for architects and planners, it would provide clear guidelines for designing



climate-appropriate, pedagogically supportive, and culturally resonant educational spaces. Future research should focus on piloting these typologies in diverse regional contexts within Uzbekistan, incorporating feedback from educators, students, and communities to refine the classification system. By grounding typology formation in both global insights and national realities, Uzbekistan can create an educational infrastructure that not only meets current needs but also anticipates the evolving demands of the 21st century.

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