



The Scientific Legacy and Character of Mirzo Ulugbek

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DOI:

<https://doi.org/10.47134/diksima.v2i3.224/>

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Received: 11-05-2025

Accepted: 18-06-2025

Published: 06-07-2025



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Abstract: This article examines the scientific and educational legacy of Mirzo Ulugbek, a prominent scholar of the Islamic world and beyond, focusing on national and international efforts to study and promote his contributions. It highlights the legal frameworks supporting these initiatives and analyzes Ulugbek's character as depicted in a letter by Giyasuddin Kashi to his father, revealing unique aspects of his personality. The study underscores the importance of familiarizing younger generations with the lives of great scholars, applying their knowledge practically, and shaping their image as role models, which is a key objective of education.

Keywords: Samarkand, Scientific-Educational Heritage, Ulugbek School, Giyasuddin Kashi, Spiritual Potential, Education

Introduction

In today's information age, the Islamic world cannot achieve progress without advancing its educational systems. The contributions of medieval Islamic scholars, nurtured in major intellectual centers such as Damascus, Cairo, Kufa, Basra, Mecca, Medina, Baghdad, Samarkand, and Bukhara, have significantly influenced the scientific achievements of modern developed nations (Ahmedov et al., 1996). Among these scholars, Mirzo Ulugbek stands out as a pivotal figure whose scientific legacy continues to inspire global scholarship.

Since Uzbekistan's independence in 1991, extensive efforts have been made to study and popularize Ulugbek's life and work through research, local and international conferences, and the preservation of architectural monuments from his era (Hasanov, 2011). This article explores these efforts, the legal frameworks supporting them, and Ulugbek's character as portrayed by his contemporary, Giyasuddin Kashi. It also emphasizes the educational value of promoting Ulugbek's legacy to inspire future generations.

Methodology

Historical Context and Institutional Efforts

Mirzo Ulugbek (1394–1449), a Timurid ruler and astronomer, is celebrated for his contributions to astronomy, mathematics, and education. His establishment of the Samarkand Observatory and madrasa transformed the city into a global hub of learning

during the 15th century (Mamadazimov, 1989). Recognizing his global significance, UNESCO included Ulugbek's jubilee in its 1994 list of world celebrations, prompting Uzbekistan's First President, Islam Karimov, to declare 1994 as the "Year of Mirzo Ulugbek" through Presidential Decree No. PF-796 (Lex.uz, 1994).

More recently, on September 12, 2023, President Shavkat Mirziyoyev signed Resolution No. PQ-323 to commemorate the 630th anniversary of Ulugbek's birth, emphasizing the need to study and promote his scientific legacy both nationally and internationally (Lex.uz, 2023). These initiatives reflect Uzbekistan's commitment to preserving Ulugbek's contributions, enhancing the intellectual and spiritual potential of youth, and fostering national pride in its scholarly heritage.

Legal Framework for Promoting Ulugbek's Legacy

The promotion of Ulugbek's legacy is supported by a robust legal framework in Uzbekistan. The 1994 Presidential Decree marked a significant step in institutionalizing efforts to honor Ulugbek, leading to the organization of conferences, exhibitions, and preservation projects (Lex.uz, 1994). The 2023 Presidential Resolution further reinforced these efforts, outlining specific measures to deepen research, restore historical sites, and integrate Ulugbek's legacy into educational curricula (Lex.uz, 2023).

These legal instruments align with broader national policies to preserve cultural and scientific heritage, as articulated by President Mirziyoyev in his speeches. He has emphasized the role of education in shaping youth who are aware of their historical roots and capable of meeting modern challenges while remaining true to their national identity (Mirziyoyev, n.d.).

Ulugbek's Scientific Contributions

The Samarkand Observatory and the Ulugbek School

The Samarkand Observatory, established by Ulugbek in the 1420s, was a landmark in the history of astronomy. Equipped with advanced instruments, it surpassed earlier observatories in Baghdad, Isfahan, and Maragha in precision and scale (Mamadazimov, 1989). The observatory's flagship achievement, the *Zij-i Jadid-i Guragani* (New Astronomical Tables), compiled by Ulugbek and his team, became a cornerstone for astronomers in both the East and West for centuries (Ahmedov et al., 1996).

The Ulugbek School, comprising scholars like Giyasuddin Kashi and Qazizoda Rumi, fostered a collaborative environment for scientific inquiry. Their work on planetary motion, geographic coordinates, and time measurement enriched medieval astronomy, earning recognition from global scholars (Hasanov, 2011). The *Zij* provided precise astronomical data, influencing observatories in Europe and Asia and cementing Ulugbek's legacy as a pioneer of empirical science.

Contributions to Mathematics and Education

Beyond astronomy, Ulugbek made significant contributions to mathematics, particularly in trigonometry and geometry. His madrasa in Samarkand, established in 1420,

was a prestigious center where he personally delivered lectures on mathematics and astronomy (Mamadazimov, 1989). The curriculum integrated classical works by Greek and Persian scholars with contemporary research, fostering a multidisciplinary approach to learning.

Ulugbek's emphasis on education extended to his governance. He supported scholars from across the Islamic world, creating a vibrant intellectual community in Samarkand (Ahmedov et al., 1996). His efforts laid the foundation for a scientific renaissance in Central Asia, influencing subsequent generations of scholars.

Giyasuddin Kashi's Letter: A Portrait of Ulugbek's Character

A primary source for understanding Ulugbek's character is a letter written by Giyasuddin Kashi, a leading mathematician and astronomer of the Ulugbek School, to his father around 1420–1421. Discovered in the Sipahsalar Mosque Library in Tehran, the letter has been translated into Persian, Turkish, English, Arabic, Russian, and Uzbek, providing valuable insights into Ulugbek's personality and scholarly environment (Boboyev, n.d.).

Result and Discussion

Ulugbek as a Scholar and Leader

Kashi describes Samarkand as a superior cultural and intellectual center compared to Kashan, attributing its prominence to Ulugbek's patronage. He portrays Ulugbek not only as a capable ruler but also as a distinguished scholar with exceptional knowledge in astronomy, mathematics, Islamic jurisprudence, logic, and literature (Hasanov, 2011). Kashi highlights Ulugbek's mastery of Arabic grammar, calligraphy, and Quranic exegesis, noting his ability to recite verses and scholarly interpretations from memory.

Ulugbek's intellectual prowess is further evidenced by his lectures on Nasiruddin Tusi's *Tazkira* and other astronomical texts, which Kashi describes as remarkable for their depth and clarity (Ahmedov et al., 1996). His photographic memory allowed him to calculate solar longitudes with precision, a skill that impressed his contemporaries. Kashi also notes Ulugbek's active participation in scholarly debates, often alongside his mentor, Qazizoda Rumi, whom he regards as a paragon of erudition.

Ulugbek's Personal Qualities

Kashi's letter reveals Ulugbek's humility and dedication to learning. Despite his status as a ruler, Ulugbek engaged with scholars as an equal, fostering an environment of open dialogue and intellectual rigor (Mamadazimov, 1989). His construction of the madrasa and observatory, detailed in the letter, underscores his commitment to advancing knowledge. Kashi also mentions a solar clock installed on the observatory's wall, a detail corroborated by later scholars like Qari Niyazi, highlighting Ulugbek's innovative approach to scientific instrumentation (Boboyev, n.d.).

Influence on Contemporary Scholarship

Kashi's letter confirms Ulugbek's engagement with the works of earlier scholars like Abu Rayhan Biruni, whose *Qanun-i Mas'udi* was a key reference for the Ulugbek School (Hasanov, 2011). The letter also notes the dedication of Alauddin al-Bukhari's commentary on Abu Hanifa's *Fiqh al-Akbar* to Ulugbek, indicating his influence in Islamic jurisprudence (Ahmedov et al., 1996). These references underscore the interconnectedness of Samarkand's scholarly community with the broader Islamic intellectual tradition.

Educational and Cultural Significance

Ulugbek's legacy extends beyond his scientific achievements to his role as an educator and cultural figure. His establishment of institutions like the Samarkand madrasa and observatory created opportunities for scholars from diverse regions, fostering a cosmopolitan intellectual culture (Mamadazimov, 1989). The preservation of these sites, many of which are UNESCO World Heritage landmarks, reflects Uzbekistan's ongoing commitment to honoring Ulugbek's contributions (Lex.uz, 2023).

The poet and statesman Alisher Navoi, in his *Majalis al-Nafais*, praises Ulugbek as a "wise king" with profound knowledge of the Quran, astronomy, and mathematics. Navoi also credits Ulugbek with poetic talent, citing verses that demonstrate his literary finesse (Ahmedov et al., 1996). This multifaceted portrayal underscores Ulugbek's role as a cultural icon whose legacy transcends disciplinary boundaries.

Relevance to Modern Education

President Mirziyoyev has emphasized the importance of educating youth to appreciate their historical roots while adapting to contemporary challenges. He advocates for an education system that instills values of morality, patriotism, and intellectual curiosity, drawing inspiration from figures like Ulugbek (Mirziyoyev, n.d.). By studying Ulugbek's life and achievements, young people can develop a sense of identity and purpose, answering the question, "Who are we, and what great ancestors do we descend from?"

Ulugbek's legacy offers several lessons for modern education:

- **Interdisciplinary Learning:** His integration of astronomy, mathematics, and Islamic studies exemplifies the value of a holistic education.
- **Scientific Inquiry:** The empirical rigor of the Samarkand Observatory encourages students to pursue evidence-based research.
- **Leadership and Patronage:** Ulugbek's support for scholars demonstrates the importance of fostering intellectual communities.
- **Cultural Pride:** His achievements inspire national pride and global recognition, motivating youth to contribute to their society.

Challenges and Future Directions

Despite significant efforts to promote Ulugbek's legacy, challenges remain. These include the need for more comprehensive translations of primary sources, enhanced digital access to his works, and increased international collaboration to study his contributions

(Boboyev, n.d.). The restoration of historical sites, such as the Samarkand Observatory, requires sustained investment to ensure their preservation for future generations.

Future initiatives should focus on:

- Digital Archiving: Creating online repositories of Ulugbek's works and related documents to facilitate global access.
- Educational Integration: Incorporating Ulugbek's legacy into school curricula to inspire STEM and humanities students.
- International Partnerships: Collaborating with institutions like UNESCO to promote Ulugbek's contributions on a global stage.
- Youth Engagement: Organizing workshops and exhibitions to engage young people with Ulugbek's scientific and cultural heritage.

Conclusion

Mirzo Ulugbek's scientific legacy and character, as illuminated by Giyasuddin Kashi's letter and other historical sources, represent a pinnacle of Central Asian scholarship. His establishment of the Samarkand Observatory and madrasa, coupled with his personal dedication to learning, transformed the region into a global intellectual hub. Uzbekistan's legal and institutional efforts, from the 1994 Presidential Decree to the 2023 Resolution, underscore the nation's commitment to preserving and promoting this legacy.

By studying Ulugbek's life, modern educators can inspire youth to embrace their historical roots, pursue interdisciplinary knowledge, and contribute to societal progress. His legacy serves as a bridge between past and present, reminding us of the enduring power of science, education, and cultural pride. As Uzbekistan continues to build a "New Uzbekistan," Ulugbek's example remains a beacon for fostering intellectual and moral excellence in future generations.

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