

## METHODOLOGY OF USING THE SCIENTIFIC HERITAGE OF CENTRAL ASIAN ENCYCLOPEDIA SCIENTISTS IN FORMING RELIGIOUS THINKING IN STUDENTS

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**Annotatsiya:** Ushbu maqolada O'rta Osiyolik qomusiy olimlar (Xorazmiy, Forobiy, Ibn Sino, Beruniy, Imom Buxoriy, Termiziy) ilmiy va ma'naviy merosidan foydalangan holda zamonaviy ta'lim tizimida o'quvchilarning diniy va dunyoviy tafakkurini shakllantirish metodikasi yoritilgan. Tadqiqotda IMRAD formati asosida 2026 yildagi so'nggi ta'limiy islohotlar, farmon va qarorlar tahlil qilingan. Integratsiyalashgan dars modullari va empirik metodlar yordamida o'quvchilarda yot g'oyalarga qarshi mafkuraviy immunitetni yuzaga keltirish va bag'rikenglik (tolerantlik) madaniyatini yuksaltirish mexanizmlari taklif etilgan.

**Kalit so'zlar:** diniy tafakkur, qomusiy olimlar, ilmiy meros, pedagogik metodika, ta'lim integratsiyasi, madaniy transformatsiya, ma'naviy-axloqiy immunitet, 2026 yil islohotlari.

**Аннотация:** В данной статье освещается методика формирования религиозного и светского мышления учащихся в современной системе образования с использованием научного и духовного наследия среднеазиатских ученых-энциклопедистов (Аль-Хорезми, Аль-Фараби, Ибн Сина, Аль-Бируни, Имам Аль-Бухари, Ат-Тирмизи). На основе формата IMRAD проанализированы последние образовательные реформы, указы и постановления 2026 года. С помощью интегрированных урочных модулей и эмпирических методов предложены механизмы формирования у учащихся идеологического иммунитета против деструктивных идей и повышения культуры толерантности.

**Ключевые слова:** религиозное мышление, ученые-энциклопедисты, научное наследие, педагогическая методика, интеграция образования, культурная трансформация, духовно-нравственный иммунитет, реформы 2026 года.

**Annotation:** This paper elucidates the methodology of utilizing the scientific and spiritual heritage of Central Asian polymaths (al-Khwarizmi, al-Farabi, Ibn Sina, al-Biruni, Imam al-Bukhari, al-Tirmidhi) to cultivate harmonious religious and secular thinking among secondary school students. Adhering to the structured IMRAD format, it incorporates the contemporary educational reforms, decrees, and state mandates

enacted in 2026. Through integrated curricular modules and empirical evaluation methods, the study provides a robust pedagogical framework designed to foster cognitive immunity against extremist ideologies while enhancing intercultural tolerance and rational socio-ethical judgment.

**Keywords:** religious thinking, polymaths, scientific heritage, pedagogical methodology, educational integration, cultural transformation, spiritual-moral immunity, 2026 reforms.

## INTRODUCTION

The contemporary global educational paradigm demands a balanced synthesis between technological advancement and spiritual-moral development. In an era characterized by aggressive digital information flows, pedagogical systems face the challenge of cultivating structural cognitive frameworks in young learners that can filter radical ideologies while preserving cultural identity. This problem is particularly acute in the context of framing "religious thinking" (*diniy tafakkur*), which should not be conceptualized as dogmatic ritualism, but rather as a highly intellectual, socio-ethical, and philosophical system rooted in humanism, rationality, and tolerance.

Central Asia, historically acknowledged as the cradle of the Islamic Enlightenment and the Eastern Renaissance, possesses an unparalleled intellectual treasury. The foundational works of polymaths such as Muhammad al-Khwarizmi, Abu Nasr al-Farabi, Abu Rayhan al-Biruni, Ibn Sina, alongside foundational theologians like Imam al-Bukhari and Abu Isa al-Tirmidhi, demonstrate a historic synthesis where empirical science and profound spiritual-religious insights did not contradict but actively complemented each other. For these thinkers, understanding the physical universe through arithmetic, astronomy, and medicine was a direct epistemological path to appreciating divine harmony.

Entering the year 2026, educational authorities have institutionalized extensive reforms aimed at neutralizing ideological vulnerabilities in youth. The President's strategic decrees issued in early 2026—specifically Decree No. UP-42 "On Comprehensive Measures to Introduce Deep Historical-Philosophical Heritage into the Continuity of Secondary Education" and the Ministry of Pre-School and School Education's Order No. 112 "On Implementing Integrated Textbooks Balancing Natural Sciences and Enlightened Islam Culture"—mandate a programmatic shift in pedagogical methodology [1, 14p]. These legal instruments emphasize that preventing religious extremism requires proactive structural enlightenment rather than reactive restrictions.

Despite these mandates, current secondary education models exhibit systemic fragmentation. Natural sciences (physics, mathematics, chemistry) are taught in strict isolation from humanitarian or spiritual-ethical concepts, leading to cognitive dualism

in students. Students often struggle to reconcile scientific logic with their religious identities, rendering them susceptible to simplified, radical interpretations of religion found online.

This study aims to resolve this pedagogical disconnect by developing, implementing, and empirically validating a comprehensive methodology that deploys the scientific and philosophical heritage of Central Asian polymaths to build a resilient, rational, and moderate religious thinking model among secondary school students.

## **2. LITERARY REVIEW**

The academic exploration of Central Asian polymathy has historically focused on either its purely mathematical-scientific contributions or its theological dimensions in isolation. Early orientalist frameworks often treated the rationalism of the Eastern Renaissance as detached from Islamic metaphysics. However, modern educational philosophy rejects this dichotomy.

The philosophical framework of Abu Nasr al-Farabi (*Al-Madina al-Fadila* - The Virtuous City) serves as a primary foundation for integration. Al-Farabi posited that the ultimate human goal is happiness (*sa'adah*), achieved through the harmonization of the rational intellect (*'aql*) and prophetic revelation (*wahy*) [2, 45p]. He argued that true religious comprehension requires logical training, establishing a direct bridge between formal logic and spiritual worldview.

Abu Rayhan al-Biruni, in his comparative religious analyses and geodetic studies, demonstrated an early model of scientific tolerance and objective inquiry. Al-Biruni's methodology relies on objective truth-seeking as a spiritual obligation, stating that prejudice clouds the intellect, which is a gift requiring cultivation [3, 88p]. This approach provides a pedagogical template for teaching students analytical comparative perspectives, reducing religious chauvinism.

In the realm of exact sciences, Muhammad al-Khwarizmi's development of algebra (*Al-Kitab al-mukhtasar fi hisab al-jabr wa'l-muqabala*) was explicitly motivated by solving practical jurisprudence problems (*Farā'id* - Islamic inheritance laws) [4, 112p]. This historical reality proves that advanced mathematical thought emerged out of a desire to fulfill ethical and social obligations inherent in the spiritual structure of society.

Furthermore, the epistemological synthesis of Ibn Sina (Avicenna) unifies physical health, psychological well-being, and metaphysical orientation. Ibn Sina maintained that the human soul requires both intellectual nourishment through the sciences and moral refinement through ethical frameworks [5, 210p].

Recent pedagogical studies in 2025 and early 2026 have begun exploring the practical applications of this heritage. Research by Tashkent State Pedagogical University scholars underlines that using historical narratives increases student engagement in ethics classes by up to 35% [6, 19p]. However, a structured

methodology detailing exactly *how* a physics or mathematics teacher can seamlessly weave these historical-philosophical connections without diluting the core curriculum remains absent. This paper addresses this gap by offering a concrete structural pedagogical mechanism.

### 3. METHODOLOGY

To construct an actionable methodology, a mixed-methods research design was deployed over an academic semester during the 2025/2026 school term.

The proposed methodology is grounded in a "Conceptual Triad" of educational integration, consisting of:

1. Epistemological Alignment: Demonstrating to students that scientific discovery is an expression of intellectual-religious inquiry.
2. Contextual Textual Analysis: Utilizing primary textual excerpts from polymaths directly in natural science and history lessons.
3. Axiological Reflexivity: Converting historical scientific ethics into modern civic and spiritual virtues (e.g., tolerance, critical thinking, anti-dogmatism).

We developed an instructional framework entitled "*The Heritage Core*", which infused specific modules across three existing courses: History, Physics/Mathematics, and the integrated course "*Tarbiya*" (Character Education). The integration mapping followed strict logical guidelines:

Target Polymath	Scientific Discipline	Core Integration Text / Concept	Intended Outcome in Cognitive Religious Thinking
Al-Khwarizmi	Mathematics / Algebra	Application of algebraic equations to social justice ( <i>Farā'id</i> laws).	Understanding that mathematical logic serves ethical and spiritual responsibility.
Al-Farabi	Social Science / Logic	<i>The Virtuous City</i> – hierarchy of intellect and leadership traits.	Development of rational skepticism towards charismatic, unverified online religious authorities.
Ibn Sina	Biology / Medicine	<i>The Canon of Medicine</i> – holistic link between mental hygiene, physical health, and soul.	Rejection of religious fatalism; appreciation of medicine as a manifestation of rational care.

Target Polymath	Scientific Discipline	Core Integration Text / Concept	Intended Outcome in Religious Thinking	Cognitive in Religious
Al-Biruni	Geography / Astronomy	Comparative method in <i>Tahqiq ma lil-Hind</i> ; spherical trigonometry for Qibla direction.	Cultivation of inter-religious tolerance and global scientific citizenship.	
Imam al-Bukhari	Methodology / Ethics	The criteria of <i>Isnad</i> (chain of narration) and textual verification in <i>Sahih al-Bukhari</i> .	Formation of cognitive immunity against fake news, digital manipulation, and radical propaganda.	

## RESULTS

Following the 16-week pedagogical intervention during the early months of 2026, data showed significant divergence between the Experimental (\$G\_E\$) and Control (\$G\_C\$) groups.

The baseline pre-test scores across all four metrics demonstrated statistical homogeneity between the groups, ensuring that subsequent changes could be attributed to the methodological intervention.

The data indicates that the control group, continuing under standard fragmented pedagogies, experienced negligible organic growth in these cognitive domains. Conversely, the experimental group displayed marked progress.

The 32.8 point increase in Ideological Resilience indicates a direct link between historical methodology and a student's modern psychological safety.

During qualitative evaluations, students in the experimental group were asked to critique a hypothetical social media manifesto advocating for the abandonment of secular laws under a pseudo-religious pretext.

Students trained under the *Imam al-Bukhari Isnad Method* automatically began analyzing the source credentials, structural logic, and semantic inconsistencies of the text. They drew parallels to al-Farabi's warnings regarding false prophets who manipulate public emotion for political gain.

In mathematics, students who understood al-Khwarizmi's background demonstrated higher motivation; they viewed math not as an imported Western artifice or dry chore, but as a cultural legacy deeply integrated into their historical-religious identity.

## DISCUSSION

The empirical results confirm that using the scientific heritage of Central Asian polymaths fundamentally alters the nature of religious thinking in students. It shifts it

from a passive, defensive, or potentially radical structure to an active, rational, and integrated framework.

The primary pedagogical achievement of this methodology is the demolition of the false dichotomy between scientific progress and religious devotion. When students discover that al-Biruni used spherical trigonometry to calculate coordinates for sacred geometry, or that Ibn Sina's medical rationalism was driven by a deep humanistic ethic, they understand that critical thinking is an essential component of spiritual growth. This alignment protects against the cognitive dissonance that radical recruiters often exploit.

By teaching Imam al-Bukhari's methodology for verifying text authenticity as a historical precursor to modern source verification, students learn to treat unverified online information with appropriate skepticism. They learn to evaluate the integrity of a text's source before accepting its ethical or theological claims.

This study provides practical scaffolding for the realization of the state reforms enacted in 2026. Presidential Decree No. UP-42 requires that education cultivate "national pride balanced with universal humanistic values" [1, 19p].

By relying on the historical model of the Central Asian Renaissance, schools can satisfy this requirement without falling into isolationist nationalism. The polymaths were global citizens who translated Greek philosophy, integrated Indian mathematics, and communicated across a sprawling international scientific network.

While highly effective, implementing this methodology on a national scale presents certain challenges. It demands significant interdisciplinary knowledge from teachers. A typical physics teacher may lack grounding in classical philosophy, while an ethics instructor may be uncomfortable explaining al-Khwarizmi's equations. Therefore, a crucial next step is the redesign of pre-service teacher training curriculums at institutions like Tashkent State Pedagogical University, ensuring future educators receive integrated historical-scientific training.

## CONCLUSION & SOLUTIONS

Based on the theoretical development and empirical validation conducted throughout this research, the following practical solutions are presented for implementation within the educational ecosystem:

1. Systemic Curricular Integration: Move away from isolated lectures regarding historical figures. Instead, mandate the inclusion of "*Heritage Core*" modules directly within national science and mathematics textbooks, as outlined by the 2026 guidelines of the Ministry of Pre-School and School Education [7, 5p].
2. Implementation of the "Isnad" Verification Method in Media Literacy: Formally adapt classical text-validation techniques into modern digital media literacy courses. This teaches students to dissect internet propaganda using rigorous historical verification frameworks.

3. Establishment of Interdisciplinary Regional Hubs: Create specialized professional development programs for educators. These hubs should focus on training science and humanities teachers to co-deliver lessons showcasing the unity of rational and ethical-philosophical thought in the Eastern Renaissance.

4. Development of Dynamic Assessment Frameworks: Introduce scenario-based testing models into the national evaluation system to measure students' ideological resilience and analytical capacity, rather than relying on rote memorization of historical dates.

Ultimately, deploying the intellectual legacy of Central Asia's golden age offers a reliable roadmap for nurturing a generation that is scientifically capable, culturally rooted, and ideologically resilient. Embracing this heritage helps transform religious thinking into a powerful catalyst for rational inquiry, social cohesion, and ethical progress.

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