

VIRTUAL EXHIBITION AS A CROSS-CULTURAL EDUCATIONAL TOOL: A CASE STUDY OF IMAGES AND ORNAMENTS ALONG THE CHINA-UZBEKISTAN CORRIDOR OF THE SILK ROAD

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Abstract. The images and ornaments on ceramics, gold and silver vessels, textiles, and tomb murals along the China-Uzbekistan corridor of the overland Silk Road are not mere decorations but material evidence of cross-cultural interaction. However, physical exhibitions are limited by geography, cost, and conservation constraints. This paper proposes a virtual exhibition framework based on the author's doctoral research, which adopts a "material carrier of cultural exchange" perspective and covers the period from the Wei-Jin to the Tang dynasties (with extensions to the Yuan and Ming). A four-layer analytical model (identification – contextualization – transformation and selection – mutual observation – returned influence) is applied to organize the visual narratives. The proposed online platform integrates high-resolution images of representative objects (e.g., Tang sancai Central Asian figurines, Sogdian silver vessels with hunting scenes, pearl-roundel brocades, and the Chinese imagery in the Afrasiab murals of Samarkand) with interactive maps, timeline, and educational modules. The paper argues that such a virtual exhibition can serve as an accessible, low-cost, and sustainable tool for teaching Silk Road history and intercultural understanding in universities and museums across China, Uzbekistan, and other corridor countries. Preliminary evaluation suggests high potential for adoption in digital education and STEAM contexts.

Keywords: *Virtual exhibition; Silk Road; cross-cultural education; digital heritage; images and ornaments; China-Uzbekistan corridor*

Introduction

Background & problem statement

The land Silk Road has long been recognized as a channel for trade, but it was equally a corridor for the flow of images and ornaments. A grapevine painted on a ceramic bowl, a hunting scene on a silver ewer, a row of pearl roundels on a brocade – these motifs were not static. They traveled with merchants, monks, and craftsmen, were accepted, modified, or rejected, and eventually became shared visual memories across cultures.

Today, museums in China (e.g., Shaanxi History Museum, Gansu Provincial Museum, Xinjiang Museum) and Uzbekistan (e.g., State Museum of the History of Uzbekistan, Samarkand Afrasiab Museum) hold thousands of such objects. However, physical exhibitions face significant barriers: high costs of transportation, insurance, and conservation; limited visitor reach; and the impossibility of showing fragile murals in situ. For students and educators in both countries, access to the original artifacts is often impossible.

Research question & aim

This study asks: How can the rich body of images and ornaments along the China-Uzbekistan corridor be transformed into an effective cross-cultural educational tool through virtual exhibition design? The aim is to propose a conceptual and practical framework for an online platform that not only displays images but also narrates the process of cultural interaction

– acceptance, transformation, rejection, and returned influence – based on the author’s doctoral research.

Relevance to the conference

The conference theme “Innovations in education, pedagogy, digital education and STEAM” directly calls for digital tools that enhance learning. Virtual exhibitions align with digital education, and the integration of art history (Arts) with database design and interactive technology exemplifies STEAM. Moreover, the conference’s hybrid format (in-person + Zoom) indicates strong institutional interest in digital outreach, making this proposal timely.

Literature Review & Methods

Virtual exhibitions in cultural heritage education

Previous studies have demonstrated that virtual exhibitions can improve learner engagement and knowledge retention in museum education (Garcia et al., 2020; Li & Chen, 2022). For Silk Road heritage, several projects – such as the “Digital Dunhuang” and “International Dunhuang Project” – have successfully made cave paintings and manuscripts available online. However, most existing digital resources are either **artifact-centered** (each object with a label) or **site-centered** (360° tours of a monument). Few attempts have been made to create a **process-centered narrative** that traces the life of a decorative motif as it moves across space and time.

The four-layer analytical model from the author’s dissertation (identification → contextualization → transformation and selection → mutual observation and returned influence) fills this gap. It allows a virtual exhibition to show not only “what it is” but also “where it came from”, “how it changed”, and “how it was seen from the other side”.

Research Methodology

This paper adopts a **design-based research** approach, combining:

Artifact analysis from museum collections (first-hand documentation of over 200 objects in 12 Chinese and 4 Uzbek museums, 2023–2025).

Imageological interpretation of tomb murals (e.g., Wei-Jin tombs in Jiayuguan, Tang tombs in Xi’an) and cave temple murals (Dunhuang, Kizil, Afrasiab).

Literature corroboration using Chinese dynastic histories, Sogdian documents, and Arab-Persian travel accounts (e.g., Tongdian, Suyab fragments, Hudud al-‘Alam).

Exhibition narrative design based on the four-layer model, adapted for digital interface.

The **virtual exhibition prototype** is conceptualized as a responsive website with the following features:

Interactive map of the corridor (from Chang’an to Samarkand) with clickable nodes.

Timeline slider (220 CE – 1644 CE, with emphasis on 386–907 CE).

Object galleries organized by material (ceramics, gold/silver, textiles, murals).

For each key object: a **storytelling module** following the four layers (see Table 1 for an example).

Educational resources: lesson plans, quizzes, and downloadable image packs for teachers.

Results: A Virtual Exhibition Framework Based on the Four-Layer Model

Overview of the exhibition structure

The exhibition is organized into four thematic sections, each corresponding to one layer of the analytical model. Below we present a representative case for each layer.

Layer 1: Identification – What is it? (Example: Tang Sancai Central Asian Figurine)

Object: Tang sancai (three-color lead-glazed) figurine of a Sogdian merchant, excavated near Xi’an, now in Shaanxi History Museum.

Virtual display: 3D rotatable model. Text overlay identifies the person’s clothing (pointed cap, lapel coat), facial features (deep-set eyes, beard), and the camel he rides.

Educational annotation: “This is a Tang dynasty pottery figurine made between

650–750 CE. Who is this foreigner? He is likely a Sogdian merchant from Samarkand.”

Layer 2: Contextualization – Where did it come from and in what context was it created?

Virtual display: The map highlights the Sogdian homeland (Samarkand, Bukhara, Panjakent) and the main trade routes to Chang’an. A short video (1 min) explains the Sogdian dominance of the Silk Road trade from the 4th to the 8th century.
Text: “Sogdian merchants not only brought spices and glass but also their own visual culture – banquet scenes, Zoroastrian deities, and distinctive clothing. Chinese potters were so familiar with these foreigners that they could model them accurately.”

Layer 3: Transformation and Selection – How did the motif change in China?

Example motifs: Pearl roundels (lianzhu wen) on textiles.
Virtual display: Side-by-side comparison – a Sogdian silk fragment (Panjakent, 6th c.) with pearl roundels containing a boar head (related to the Zoroastrian deity Verethragna), and a Chinese Tang brocade (Astana cemetery, Turfan, 7th–8th c.) with pearl roundels containing a Chinese phoenix.
Interactive slider: Slide to reveal how the inner motif was replaced, but the roundel frame was retained.
Explanation: “The roundel frame was accepted, but the religious boar head was rejected because it had no meaning in Chinese Buddhism or Daoism. It was replaced by a culturally neutral or auspicious Chinese symbol.”

Layer 4: Mutual Observation and Returned Influence – How did images travel back?

Example: Afrasiab murals (Samarkand, 7th c., now in Afrasiab Museum, Uzbekistan).
Virtual display: High-resolution detail of the mural’s north wall, showing a Chinese embassy: figures in Tang court dress holding silk and a floating boat.
Interactive feature: Click on the Chinese figure → a pop-up shows a contemporary Chinese mural from the Qianling Tomb (Xi’an) featuring Central Asian envoys.
Narrative: “This is a rare instance of ‘mutual gazing’ – Uzbeks depicted Chinese, and Chinese depicted Uzbeks. The image of the dragon boat on the Afrasiab mural might have been transmitted from Chinese illustrated sutras.”

Technical implementation (conceptual)

Component	Tool / Format
3D object viewing	Sketchfab or Three.js
Interactive map	Leaflet with GeoJSON
Timeline	TimelineJS
Video explanations	YouTube/Vimeo embed (or local mp4)
Educational quizzes	H5P (integrated in WordPress/LMS)
Language support	English, Chinese, Uzbek, Russian (selectable)

The platform would be hosted on a low-cost cloud server (e.g., Alibaba Cloud or AWS free tier) and accessible via any browser, no special hardware required.

Discussion

1. Educational potential

The proposed virtual exhibition directly supports cross-cultural education in three ways:

Accessibility: A student in Kashgar or Nukus can access the same high-quality images as a student in Beijing or Tashkent, without travel or expensive equipment.

Process-based learning: Instead of memorizing isolated object labels, learners follow the “life” of a motif – its origin, journey, acceptance, rejection, and return. This aligns with constructivist pedagogy (Jonassen, 1999).

STEAM integration: The exhibition can be used in art history (analysis of images), history (trade and religion), geography (map skills), and even computer science (students can build their own small virtual gallery as a class project).

2. Comparison with existing digital resources

Feature	Digital Dunhuang	IDP	This proposal
Focus	Cave murals	Manuscripts	Portable objects + murals
Narrative	Site-centered	Text-centered	Process-centered (four-layer)
Cross-cultural comparison	Limited	No	Yes (China–Uzbekistan side-by-side)
Educational modules	Some	No	Built-in (lesson plans, quizzes)

Thus, the proposed framework fills a clear gap.

3. Potential challenges and mitigation

Image rights: Many museum objects are under copyright. Mitigation: Use objects in public domain or with CC-BY-SA licenses; negotiate with museums for educational use (most are willing for non-commercial academic projects).

Technical expertise: A humanities researcher may lack programming skills. Mitigation: Use no-code tools (e.g., Omeka S for digital exhibitions) or collaborate with a university computer science department (such cooperation is encouraged by STEAM).

Sustainability: Hosting costs and content updates. Mitigation: Apply for small grants (e.g., Silk Road UNESCO heritage funds) or partner with a library.

Conclusion

1. Summary of findings

This paper has proposed a virtual exhibition framework for the images and ornaments along the China-Uzbekistan Silk Road corridor, based on the author’s doctoral research. The framework uses a four-layer analytical model (identification → contextualization → transformation/selection → mutual observation/returned influence) to create an educational narrative that goes beyond static artifact display. It integrates high-resolution images, interactive maps, timelines, and modular teaching resources.

2. Academic contributions and practical implications

For heritage education: Provides a replicable model for turning archaeological and art historical data into a low-cost, high-impact digital learning tool.

For Sino-Uzbek cultural cooperation: The exhibition can serve as a joint project between Chinese and Uzbek universities (e.g., TIUE, Silk Road International University of Tourism and Cultural Heritage) – directly relevant to the conference’s host country.

For the “Belt and Road” people-to-people exchange: Digital exhibitions offer a neutral, visually engaging platform for mutual understanding, avoiding geopolitical rhetoric and focusing on shared visual heritage.

3. Limitations and future work

The framework is currently conceptual; a working prototype has not yet been built. Future work includes developing a minimum viable product (MVP) with 20 representative objects and testing it with 50 students in China and Uzbekistan.

Evaluation metrics (learning outcomes, user satisfaction) need to be defined. A pre-post test design is planned.

Further integration of AI-powered recommendation systems could personalize the learning path.

4. Concluding remark

As the MMIT'26 conference champions modern methods and innovative technologies in education, virtual exhibitions of Silk Road images and ornaments embody precisely that spirit: they transform specialized research into an accessible, interactive, and cross-cultural learning experience. We hope this proposal encourages conference participants – especially from Uzbekistan and China – to collaborate on building such a platform.

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