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Original Paper

Knowledge Transfer and Talent Development in Traditional Craftsmanship: An HRM Perspective from Atlas Silk

Longfei Li[1], Jiaxuan Li[2*], Haoran Yin[3], & Xingyan Chen[4]

[1] Beijing City University, Beijing, China

[*] Corresponding Author: Haoran Yin, Beijing City University, Beijing, China, beyong0303@163.com

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Abstract

Based on 30 named individual cases documented in public media reports, this paper analyzes the knowledge structure, transmission pathways and talent development challenges associated with Atlas Silk craftsmanship from a human resource management perspective. The B1-B11 framework is used to summarize knowledge content and training arrangements, and the C1-C10 framework is used to identify training, retention and job support issues. The results show that the process and material knowledge can be incorporated into structured training, and the embodied experience of warping, dyeing and weaving still depends on long-term field practice. Families, workshops, cooperatives, colleges and digital communication have complementary functions. To support talent succession, we should combine the phased ability development, compensation guarantee, whole process rotation, dual-mentor training and work design that takes into account the family situation. This paper is a purposively selected literature-based case study, which is not statistically representative.

Keywords

Atlas Silk, knowledge transfer, talent training, human resources management, qualitative case study

1. Introduction

The continuation of the intangible cultural heritage of traditional handicrafts depends not only on the preservation of technological processes and product forms, but also on the sustainable transfer of knowledge and the growth of a new generation of practitioners. Traditional skills include descriptive operation steps, as well as hand feeling, experience judgment, aesthetic standards and cultural knowledge formed by long-term practice. With changes in production methods and consumer markets, traditional crafts face challenges including lengthy learning periods, limited youth participation, unstable income and an ageing workforce.

Atlas Silk is a representative traditional handmade textile technology in northwest China. Its production involves raw material processing, warping, dyeing and weaving. The process name and basic steps can be taught through explanation, illustration and courses, while the skills such as warping strength, dyeing judgment, yarn tension and weaving rhythm depend on observation, imitation and repeated practice. The existing reports pay more attention to process protection, pattern dissemination and product innovation, and there is still room for discussion on how to transfer technical knowledge, how to connect different training modes, and how to retain talents.

From a human resource management perspective, this paper analyzes the knowledge structure, transmission modes and talent development practices associated with Atlas Silk craftsmanship, drawing on named individuals and training practices documented in public reports, and focuses on answering three questions : (1) what types of knowledge are included in traditional skills ; (2) how families, apprentices, workshops, cooperatives, institutions and digital methods transfer knowledge ; (3) how to promote talent succession through training development, incentive guarantee and career development.

2. Literature Review

Knowledge management focuses on the identification, organization, sharing and application of knowledge. In traditional processes, production processes, tool specifications and material information can be recorded as explicit knowledge, while practical judgments, sensory experiences and operational skills are often embedded in individual practices. Polanyi (1966) explained the nature of tacit knowledge, while Nonaka and Takeuchi (1995) emphasized the interaction between explicit knowledge and tacit knowledge in knowledge creation. Recent studies have also examined how tacit knowledge is acquired and applied in real work environments (Saari & Koivunen, 2022). These perspectives provide a theoretical basis for examining the different types of knowledge involved in traditional process production and their transmission needs.

Apprenticeship and workplace learning are important mechanisms for cultivating practical skills. Lave and Wenger (1991) emphasized learning through participation in communities of practice, while Billett (2001) emphasized the role of workplace participation in learning and skill development. In traditional crafts, observing, imitating, guiding practice and interacting with experienced practitioners enable learners to gradually acquire operational capabilities. Therefore, family-based learning, workshops, cooperatives and educational institutions can provide a complementary environment for knowledge dissemination.

Recent research further suggests that a supportive workplace learning climate can contribute to employee retention (Grohnert et al., 2021). From the perspective of human resource management, talent development involves more than the initial skills training. It also requires continuous learning, capacity development, appropriate incentives and career opportunities. Talent retention is affected by economic benefits, working conditions, professional recognition and development prospects. These considerations provide a basis for examining the challenges faced by traditional crafts practitioners and

identifying management methods that may support their long-term participation. Therefore, this study adopts an analytical perspective that links knowledge types, communication arrangements, talent development and retention.

3. Research Methodology

This study combines qualitative case study and secondary data content analysis. The research focuses on individuals involved in Atlas Silk craftsmanship, design, production, business operations and talent development, as documented in public media reports. After screening and deduplication, a total of 30 named individual cases (S1-S30) were included. Case selection follows four criteria : source traceability, case relevance, individual identifiability, and availability of full-text reports. Reports with no verifiable identity or clear evidence related to Atlas Silk were excluded. For reports involving multiple topics, only relevant Atlas Silk content is extracted.

The unit of analysis is named individuals rather than media reports. The dataset consists of 30 individuals recorded in 35 source records (SRC-01 ~ SRC-35). A single report can support multiple cases, and an individual can be recorded in multiple reports. Therefore, independent cases and source identifiers are used to maintain data traceability. This study relies entirely on publicly available second-hand materials and does not involve original interviews or field observations.

Table 1. Composition of the 30 Publicly Documented Individual Cases

Main reporting roles	Case No.	Quantity
Traditional inheritors, artisans, weavers & home learners	S1、S3、S4、S6、S7、S9—S13、S16、S26	12
Workshop/coop/enterprise organizers, training leads	S2、S5、S8、S14、S15、S29	6
Design, brand, apparel & returnee entrepreneur roles	S17—S23、S25、S27	9
R&D, vocational ed & experiential comms roles	S24、S28、S30	3
Nature of evidence	All based on public named cases	30

Note: Cases are classified by primary reporting role; all 30 cases are supported by verified full-text media reports. See Appendix A for details.

The data analysis includes the extraction of process knowledge, the transmission of practice, training arrangements and employment information. Two analytical coding frameworks were developed through descriptive coding and cross-case comparison: B1–B11, covering knowledge types, transfer mechanisms and production-related skills; and C1–C10, covering talent development, retention and workplace challenges. These codes support topic interpretation rather than statistical measurement or causal inference.

Table 2. Analytical Coding Framework for Knowledge Types, Transfer Mechanisms and Production-related Skills (B1–B11)

Code	Knowledge category	Core content and main transmission mode
B1	Explicit process knowledge	Production sequences and operational procedures
B2	Explicit materials and dye knowledge	Plant dyes, raw materials and material selection
B3	Tacit tie-dye binding knowledge	Binding tension, spacing and hand-feel judgement
B4	Tacit dye-timing and colour-judgment knowledge	Temperature, water quality and colour assessment
B5	Tacit embodied loom-weaving knowledge	Hand-foot coordination, yarn tension and weaving rhythm
B6	Cultural knowledge	Motif meanings, colour aesthetics and traditional usage
B7	Hybrid market and design knowledge	Garment design, branding, channels and aesthetics
B8	Organised workshop and cooperative transfer	Senior-artisan guidance and order-based training
B9	Institutional and digital transfer	Motif archives, digital resources and educational instruction
B10	Communicative transfer	Livestreaming, exhibitions and interactive cultural experiences
B11	Production-organisation skill conversion	Integration of manual craftsmanship with standardised and mechanised production

Note: B1–B7 represent knowledge types and capabilities, B8–B10 represent transmission mechanisms, and B11 represents production-related skill transformation. See Appendix B for details.

This study has limitations. Media reports may reflect selective reporting and incomplete information. The 30 cases selected purposefully are not statistically representative and cannot establish an industry-wide revenue, turnover or training penetration model.

4. Traditional Craft Knowledge and Inheritance

Atlas Silk craft includes explicit, tacit and embodied knowledge, cultural knowledge, as well as design, market and production-related capabilities. The explicit knowledge includes production process and material information (B1 ~ B2), such as silk preparation, silk yarn division, weaving sequence and the use of plant dyes. These elements can be transmitted through oral instruction, demonstration and structured training. However, understanding the production process does not necessarily mean gaining independent operational capability.

Tacit knowledge and embodied knowledge (B3 ~ B5) require continuous practical experience. The cases of S1, S2, S10 and S11 illustrate how to learn binding force and spacing by observation, imitation and repeated revision. Similarly, dyeing judgment (S3 and S9) and weaving coordination (S7 and S16) also rely on accumulated experience and personal practice. These findings suggest that merely recording the process does not completely replace experiential learning.

In addition to technical skills, the inheritance of Atlas Silk also involves cultural knowledge, design ability and organizational practice (B6-B11). Motif meaning and cultural context are conveyed through family learning and cultural activities (S11, S20 and S23). Design and market knowledge are developed through education and cross-regional exchanges, while workshops, cooperatives and digital resources provide additional training and communication channels. Production cases (S14 and S26) further illustrate the integration of traditional processes with standardized and mechanized processes. In general, the inheritance of Atlas Silk includes not only the preservation of craft techniques, but also the development of a wider range of capabilities required for its continued practice and production.

5. Knowledge Transfer and Talent Development Models

First of all, family-based intergenerational learning provides an important basis for the inheritance of skills. Practitioners acquire skills through early contact, daily observation and participation in household production. Cases such as S10, S11 and S16 showed mother-daughter transmission, while S12 and S13 showed spouse learning. This approach supports continuous knowledge sharing and cultural familiarity, although participation largely depends on family interest and availability.

Second, apprenticeship and workshop training enable learners to develop practical skills through demonstration, imitation and immediate correction. Experienced craftsmen provide guidance in the actual production process, allowing learners to acquire tacit knowledge through repeated practice. However, the long learning cycle and limited financial support may affect the continuity of apprenticeships.

Third, cooperatives and community training expand participation through organized recruitment, group guidance and order-based production. Cases S8, S14, S15 and S29 illustrate how workshops and cooperatives relate skill development to production activities. Nevertheless, specialized division of labor may limit the opportunity to master the complete production process.

Fourth, educational institutions and cross-disciplinary training complement traditional craft learning by providing knowledge of design, culture and product development. Cases S17, S22, S23 and S25 illustrate the contribution of formal education and professional exchange. However, classroom teaching cannot completely replace the practical training of experienced craftsmen.

Fifth, digital resources and communication activities support knowledge documentation and broader public participation. Cases S19, S21, S23, S24 and S30 illustrate the use of digital archives, live broadcasts, exhibitions and cultural experiences. These methods broaden the access to handicraft knowledge, but cannot develop embodied skills independently.

In general, these methods are complementary and should be combined according to the knowledge transmitted and the learner's development stage.

6. Talent Retention Challenges and HRM Strategies

Table 3. Talent Development and Retention Challenges and HRM Implications (C1–C10)

Code	HRM challenge	Reported evidence and HRM implications
C1	Long training duration	Learning motifs and colours takes about five years, while independent mastery may exceed seven years; introduce staged competency assessment.
C2	Apprentice attrition	Most of approximately 10 apprentices trained by S1 over 12 years reportedly left; provide apprentice allowances and entry-stage support.
C3	Low income and long payback	Hand weaving produces up to six metres per day, with one roll taking about 40 days; introduce quality-based and output-related compensation.
C4	Unclear career pathways	Career progression and mentoring rewards lack formalisation; establish craft and management career pathways.
C5	Fragmented skills	Division of labour may limit full-process learning; introduce job rotation and whole-process skill assessment.
C6	Tacit knowledge transfer barriers	Experience is difficult to codify; strengthen master-apprentice guidance and practical training.
C7	Digitalisation as substitution	Digital motif archives support knowledge documentation but cannot replace embodied skills; combine explicit knowledge archiving with

Code	HRM challenge	Reported evidence and HRM implications
		on-site mentorship.
C8	Undervaluation of handwork	Machine-made imitations compete at lower prices;strengthen craft authentication and product traceability.
C9	Innovation-authenticity tension	Design adaptation may simplify traditional motifs and colours; establish core craft standards.
C10	Gender and household-role context	Reports document family-based and intergenerational transmission; consider flexible and accessible training arrangements.

The first set of challenges relates to training and talent development (C1, C2, C5, C6). The study of traditional crafts takes a long time, and fragmented production tasks may make apprentices unable to master the complete process. It is reported that the departure of most apprentices trained in S1 also highlights the difficulty of continuing to participate during the long period of study. These challenges indicate the need for phased capacity development, whole-process job rotation, practical assessment and financial support during the apprenticeship period.

The second group deals with salary, career development and talent retention (C3, C4, C8). Time-consuming artisanal production, uncertain order revenues and competition from lower-priced mechanically manufactured products may weaken the economic appeal of traditional handicrafts. At the same time, unclear career paths and insufficient understanding of mentoring contributions may limit long-term professional development. Potential HRM responses include combining output-based and quality-based compensation, establishing process and management career pathways, and improving product identification and traceability to support manual value identification.

The third group is the sustainable development of job design and traditional processes (C7, C9, C10). Digital resources can support document and knowledge sharing, but cannot replace the formation of practical skills. Similarly, product innovation needs to balance the preservation of contemporary design requirements and essential process characteristics. Although these cases record women 's participation in family and intergenerational transmission, they do not directly establish the size of family care responsibilities. Therefore, flexible working arrangements and available local training may be considered as potential support measures rather than conclusions about reporting individuals. Overall, sustainable talent development requires the integration of skills training, economic incentives, career opportunities and supportive work arrangements.

7. Discussion and Conclusion

Based on 30 publicly documented individual cases, this study examines the relationship between knowledge structure, inheritance arrangements and talent development in Atlas Silk craftsmanship. The study found that traditional craft knowledge includes explicit craft, tacit and embodied skills, cultural knowledge, and design and production-related capabilities. These forms of knowledge need different ways of transmission. Although procedural and material knowledge can be recorded and incorporated into structured training, practical skills rely on observation, repeated practice, and the guidance of experienced practitioners. This finding highlights the importance of combining knowledge documents with workplace-based learning.

The research also shows that sustainable process inheritance requires multiple training arrangements, rather than relying on a single apprenticeship model. Family learning, workshops, cooperatives, educational institutions and digital resources play a complementary role in knowledge transfer. However, from the perspective of human resource management, knowledge dissemination alone is not enough to ensure the continuity of talent. Longer learning years, loss of apprenticeships, uncertain economic benefits, fragmented skill development and unclear career paths pose challenges for practitioners' retention. Therefore, phased capacity development, apprenticeship support, appropriate pay, career advancement, full-process job rotation and supportive work arrangements may contribute to more sustainable talent development.

This study has the following limitations. The findings are based on cases of public media coverage and purposeful choices, which may reflect reporting bias and incomplete information. These 30 cases are not statistically representative and cannot establish an industry-wide income, turnover or training prevalence model. Future research can combine interviews, questionnaires, and workplace observations, including craftsmen, apprentices, workshop operators, and educators, to further test the proposed knowledge dissemination and talent development mechanisms.

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