

Localized Design of Geographic Research-Based Learning Courses from the Perspective of Rural Landscape Texture — A Case Study of Hekou Ancient Town in Lanzhou

Jing Bai*, Ganyu Feng, Taohui Sun, Xiaohui Bai, Baya Gong

College of Geography and Environmental Science, Northwest Normal University, Lanzhou 730070, Gansu, China

**Author to whom correspondence should be addressed.*

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Abstract: As a key link in implementing the philosophy of fostering virtue through education and promoting quality-oriented education, research-based learning courses show particularly prominent value in local geographic education. Based on rural landscape texture and taking Hekou Ancient Town in Lanzhou as the practical site, this study designs and carries out local geographic research-based learning courses for senior high school students by relying on local rural landscapes. It aims to enhance students' sense of identity and pride in local culture, and provide useful practical teaching references for realizing the comprehensive transformation of quality-oriented geographic education from internal identity to external action.

Keywords: Rural landscape texture; Core geographic literacy; Research-based learning travel; Hekou Ancient Town

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1. Introduction

Research-based learning courses are out-of-school educational activities with inquiry learning as the core and travel experience as the carrier. Featuring autonomy, comprehensiveness, practicality and exploration, they have been incorporated into the comprehensive practical activity curriculum system of primary and secondary schools ^[1]. Against the background of deepening educational reform and cultivating core literacy, geographic research-based learning courses, as an innovative teaching model driven by practical tasks ^[2], can effectively cultivate students' geographic practical ability through situational field exploration and project-based practical tasks, deepen knowledge understanding and application, strengthen cultural consciousness and confidence, and realize the leap from “internalization of geographic knowledge – skill transfer practice – local cultural identity” ^[3].

As the core resource for localized education of geographic research-based learning courses, rural

landscape has attracted extensive attention for its multi-dimensional educational value ^[4]. Rural landscape is the spatial representation of rural regional complex, the interactive carrier of geographic logic and local cultural identity, and the vivid embodiment of the integration of geographic thinking and local culture ^[5]. The “Compulsory Education Geography Curriculum Standards” includes local geography as a compulsory module, requiring the cultivation of regional cognition and human-earth coordination through the investigation of the natural and human environment of hometowns, reflecting the transformation of geographic education from knowledge imparting to literacy orientation ^[6]. Relying on the locality and embodiment of rural landscapes, we provide students with an intuitive and vivid learning platform, promoting the hierarchical development of core geographic literacy ^[7].

Located on the bank of the Yellow River in Xigu District, Lanzhou City, Hekou Ancient Town is an important node on the Silk Road. It is rich in rural landscape resources and serves as a micro typical case of the rural human-earth relationship regional system in the arid region of Northwest China^[8]. Guided by core geographic literacy, this study selects Hekou Ancient Town as the research field, clarifies the internal connection between the ancient town’s rural landscape and geographic environment, and implements the requirements of the senior high school geography curriculum standards. By organizing senior high school students in Gansu Province to conduct on-site learning and interview surveys, the study improves students’ cultural cognition and value recognition of local landscapes, realizes the literacy advancement from knowledge acquisition to cultural identity and then to inheritance actions, and provides an operable and replicable paradigm for the design of regional geographic research-based learning courses.

2. Educational value analysis and curriculum transformation mechanism of rural landscape texture

As a comprehensive embodiment of the natural foundation and human representation of rural regional systems ^[9], rural landscape texture can be effectively integrated into geographic teaching through three paths: cognitive construction, emotional cultivation and practical empowerment. In terms of cognitive construction, it intuitively presents geographic elements such as river systems and street layout, transforming abstract concepts such as human-earth relationship and regional differentiation into observable and analyzable objects, guiding students to vividly understand the geographic environment. In terms of emotional cultivation, the material and intangible cultural heritage contained in it carries regional genes, which can deepen students’ identity and responsibility for local culture. In terms of practical empowerment, rural landscape texture provides situations for the cultivation of geographic practical ability by virtue of its localization and embodiment, promoting students to realize the hierarchical development of “knowledge and skills – processes and methods – emotional attitudes and values”.

On the basis of understanding its educational value, transforming rural landscape texture into geographic learning tasks should follow the principle of adapting to local resources. Curriculum design should rely on curriculum standards and students’ cognition, extract key landscape elements, and deconstruct them into educational modules available for exploration; connect landscape elements with knowledge points through inquiry learning, and create problem situations; establish a multi-dimensional evaluation system, focus on thinking advancement and value internalization, and attach more importance to process than results.

3. Design of geographic research-based learning courses based on rural landscape texture

3.1. Site selection and theme determination

From the perspective of rural landscape texture, the research resources of Hekou Ancient Town (as shown in **Figure 1**) have multi-dimensional characteristics of natural foundation, human representation and cultural metaphor, providing a typical regional cognitive interface for geographic research-based learning. The natural landscape texture is centered on the Yellow River, wetlands and Danxia landform, showing magnificent natural scenery and unique geographic environment in Northwest China. The ancient buildings of Ming and Qing Dynasties, the street layout of “four streets and seventeen lanes, eight streets and eight memorial archways”, and the quadrangle dwellings jointly shape the unique humanistic style and cultural heritage of the ancient town. These tangible landscapes are intertwined with intangible landscapes such as the unique resource endowment, climatic conditions, production techniques, labor experience, dietary culture and folk customs of Hekou Ancient Town, jointly shaping a unique rural landscape texture and providing valuable resources for research-based learning activities.

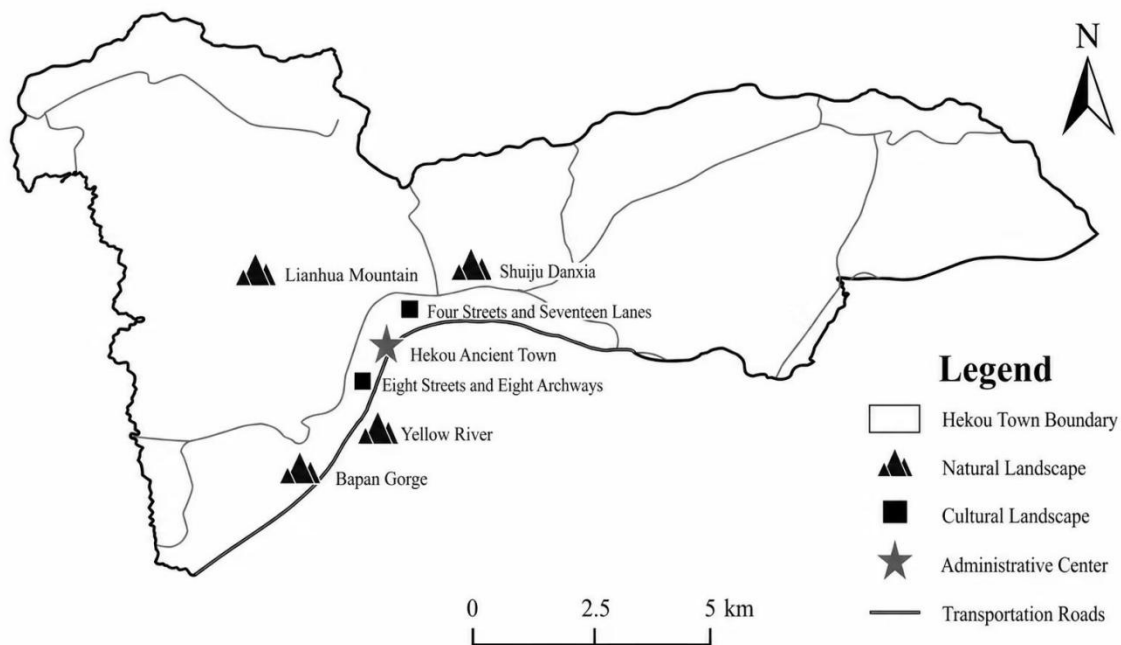


Figure 1. Sketch map of the study area.

In-depth exploration of the interaction and influence between natural and human landscapes in Hekou Ancient Town, combined with the literacy advancement model of regional cognition, comprehensive thinking and human-earth coordination view, guides students to analyze the evolution of ancient town settlement form, human-earth coordination and sustainable development paths, effectively improving students' geographic practice, comprehensive thinking and problem-solving abilities (as shown in **Figure 2**).

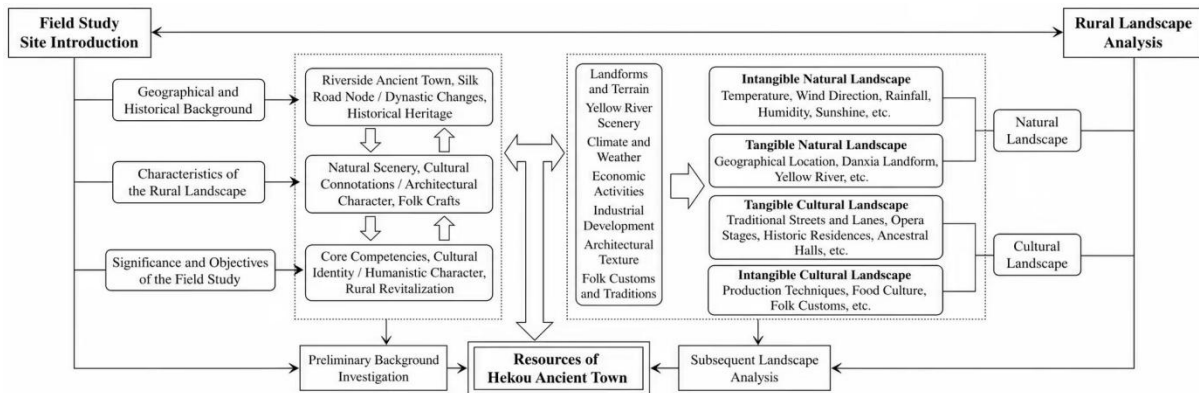


Figure 2. Sorting of Rural Landscape Resources in Hekou Ancient Town.

3.2. Student learning situation analysis

This research-based learning design is based on the “General High School Geography Curriculum Standards (2017 Edition, Revised 2020),” targeting senior high school students in Gansu Province. It focuses on the four-dimensional literacy goals of regional cognition, comprehensive thinking, human-earth coordination view and geographic practical ability, responding to the policy requirements of “activating the endogenous power of rural culture” in the “Opinions of the Central Committee of the Communist Party of China and the State Council on Comprehensively Promoting Rural Revitalization and Accelerating the Modernization of Agriculture and Rural Areas.” A rural situation is constructed according to the actual geographic learning situation of senior high school students (as shown in Figure 3) [10].

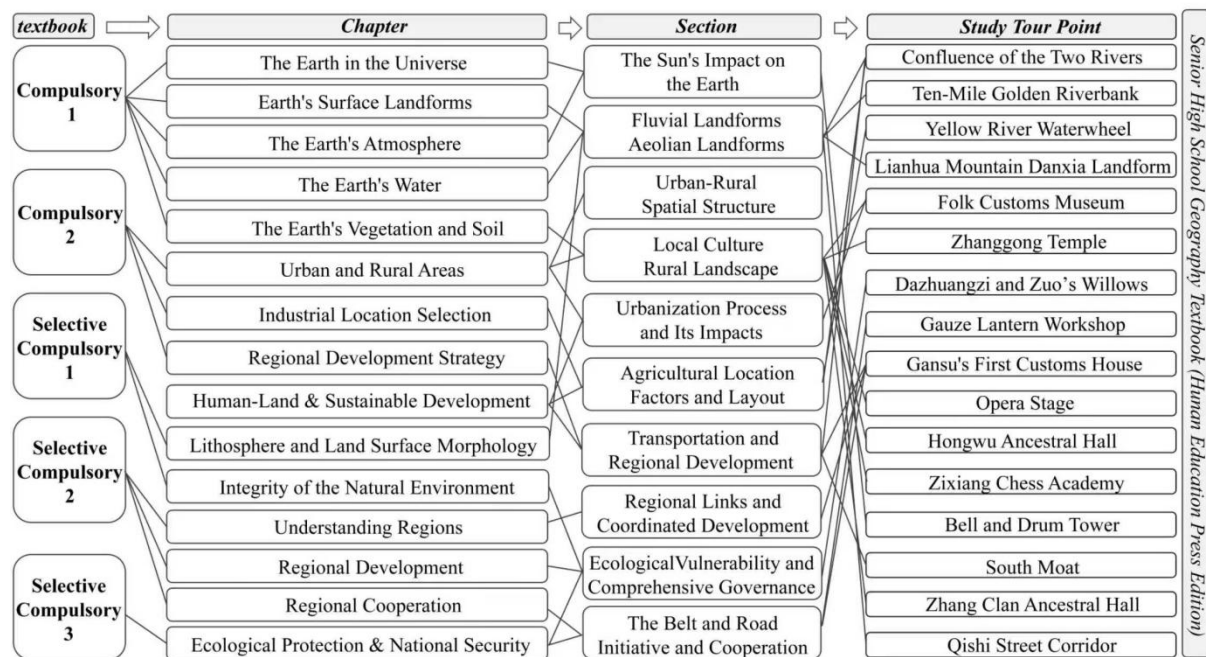


Figure 3. Summary of Knowledge Points for Research-Based Learning Tasks in General High School Geography Textbooks (Xiangjiao Version).

3.3. Curriculum objectives and design ideas

In the process of constructing the geographic research-based learning course of Hekou Ancient Town, this research program revolves closely around curriculum standards and designs a series of research-based learning activities to help students appreciate the unique charm and profound heritage of rural landscapes.

(1) Knowledge and skills

Students understand the terrain and hydrological characteristics of the ancient town by reviewing textbooks and classroom content, exploring the relationship between humans, nature, and hometown, and analyzing the formation of settlements and cultural influences. Through on-site investigations, they intuitively understand knowledge such as rivers, landforms and settlements, and expand the interdisciplinary thinking of history and geography; observe architectural styles and customs, form personal perceptions, and cultivate interest in geography.

(2) Processes and methods

Students observe the natural landscape of the ancient town, sort out human-earth relationships, observe architectural layout and street orientation, identify rural texture, compare regional differences, make mind maps, explore the relationship between natural landscape and ancient town development, and put forward suggestions for sustainable development. Analyze the causes of rural texture formation, understand its relationship with natural environment and population change; explore the evolution of cultural texture status and the impact of modern society; record the ancient town texture with charts and models, and improve comprehensive geographic practical ability.

(3) Emotional attitudes and values

During the research-based learning process, students will gradually cultivate observation, learning and communication abilities, and enhance their understanding and respect for local culture. Curriculum design focuses on the guidance of emotions, attitudes and values, pays attention to personality development, social adaptation and the formation of outlook on life and values. Through the practice of finding and analyzing problems, stimulate learning interest and develop a pragmatic and realistic scientific attitude. At the same time, guide students to pay attention to geographic national conditions, cultivate a sense of family and country, recognize the importance of human-earth coordination for sustainable development, and promote the all-round development of quality-oriented education for senior high school students.

3.4. Route preparation and consideration

(1) Student Preparation

Students should review corresponding knowledge points in geography courses, consult historical materials, and understand the climate, terrain and customs of the ancient town; prepare tools needed for research-based learning to record what they see and hear; bring daily necessities such as sports shoes, clothes, umbrellas, water cups and common medicines; complete group division of labor, clarify the tasks of each member, and formulate corresponding plans through communication and cooperation.

(2) School Preparation

The school should arrange time reasonably according to the research-based learning plan, clarify study, stay and dining periods to ensure sufficient study time; plan traffic routes in advance, understand road conditions, and select appropriate travel modes; conduct safety education and discipline standardization for students before departure to ensure the smooth development of research-based learning activities.

3.5. Comprehensive evaluation design and implementation

Research-based learning evaluation is a key link reflecting students' acquisition of knowledge and skills as well as their emotional and values, and also an important way for students to reflect on themselves and appreciate others, helping to consolidate knowledge, promote development and improve comprehensive quality.

The evaluation design of this research-based learning activity (as shown in **Figure 4**) complies with the requirements of the “Guidelines for Comprehensive Practical Activity Courses in Primary and Secondary Schools,” focusing on the integration of multi-dimensional quantification and multi-source evaluation. Students need to complete the research-based learning activity evaluation scale. The score consists of four parts: process evaluation, learning evaluation, result evaluation and plan evaluation. The comprehensive score is calculated based on a combination of student self-evaluation (20%), group mutual evaluation (30%) and teacher joint evaluation (50%).

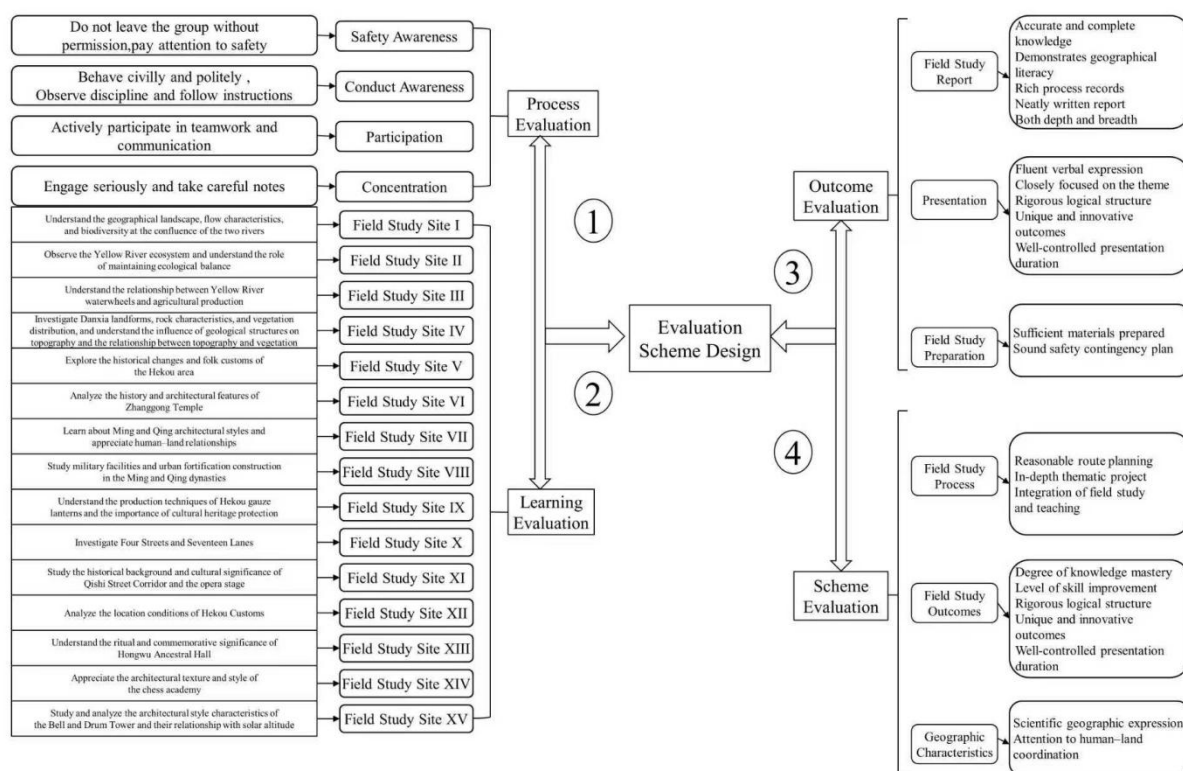


Figure 4. Design drawing of research-based learning evaluation plan.

4. Task creation of geographic research-based learning courses based on rural landscape texture

Relying on the rich natural landscapes, cultural landscapes, historical accumulations and local customs of Hekou Ancient Town, this research-based learning program (as shown in **Table 1**) plans four theme modules. Through research-based learning, students can not only enrich geographic knowledge and improve cognitive level, but also deeply understand the connotation of local culture, strengthen their belief in inheritance, and cultivate a strong sense of family and country. This process will promote the transformation of geographic practical education from internal identity to external action, and finally achieve the goal of geographic quality-oriented education.

Table 1. Research-based learning themes

Theme 1: Rhythm of the Yellow River and Picture Scroll of Danxia		
Research-Based Learning Objectives	Master hydrology, geomorphology, geology and human-earth relationship.	
	Confluence of Two Rivers	Causes of delta, hydrological characteristics and impact on regional industries.
Research-Based Learning Content	Ten-mile Golden Bank of the Yellow River	Ecological problems and protection strategies; human-earth coordination paths in the Yellow River Basin.
	Yellow River Waterwheel	Farmland irrigation mode; agricultural significance of waterwheels.
	Lianhua Mountain	Relationship between rock structure and landform.
Theme 2: Seeking Cultural Roots and Exploring Folk Customs		
Research-Based Learning Objectives	Understand the relationship between folk customs and geographic environment, and recognize the social status of culture.	
	Folk Custom Museum	Folk cultural context; inheritance paths.
Research-Based Learning Content	Zhangongci	Architectural texture and cultural symbols; environmental carrying capacity, clan migration and social formation.
	Zuo Gong Willow	Geographic characteristics of arid areas; recharge effect of Yellow River flood irrigation on groundwater.
	Ancient City Wall Ruins	Chronological changes of architectural structure.
Theme 3: Afterglow of Ancient Town and Dream of Yarn Lantern		
Research-Based Learning Objectives	Experience the charm of intangible cultural heritage and feel local feelings.	
Research-Based Learning Content	Yarn Lantern Workshop	Production background of yarn lanterns; influence of commodities on population flow, trade and cultural influence scope.
	Four Streets and Seventeen Lanes	Spatial layout and texture of streets.
Theme 4: Ancestral Halls, Customs Houses and Theaters		
Research-Based Learning Objectives	Master the internal connection between traditional culture and geography, and improve geographic practical ability and spatial thinking.	
	Customs House	Geographical location and Tea-Horse Trade function; impact of late Qing tariff on industries.
	Strange Stone Gallery / Theater	Abrasion and shaping of strange stones; folk custom performances.
Research-Based Learning Content	Hongwu Ancestral Hall	Ritual system and clan culture in brick and wood structure; site selection considering defense and clan power.
	Zixiang Chess Academy	Architectural style and regional culture; spatial utilization and human activities.
	Bell and Drum Tower	Geographic wisdom of architectural orientation, lighting and ventilation; driving of architecture for cultural communication and belief integration.

5. Practical effects and reflections of the curriculum

5.1. Precision focus and comprehensive coverage

The curriculum content covers terrain, hydrological characteristics, architectural layout and other aspects. However, extensive content may distract students' attention and affect the in-depth understanding of key knowledge. According to cognitive load theory, the working memory capacity of students is about 4 ± 1 information chunks. Therefore, each class hour focuses on 1 core concept in the design, supplemented by 3–4 related knowledge points. Through segmented teaching, students can not only master key knowledge but also form an overall understanding.

5.2. Education through fun and deep inspiration

Practical activities are designed with diversified contents such as outdoor investigations and handicraft experiences, allowing students to personally feel the charm of local culture. However, some activities may be superficial and fail to fully stimulate students' thinking and exploration interests. Based on experiential learning theory, setting progressive tasks can improve effective participation. Therefore, activity design needs to balance fun and knowledge, and help students transform knowledge learning into ability improvement through progressive practical tasks.

5.3. Objectivity, fairness and potential inspiration

The curriculum designs multi-dimensional and multi-level evaluation methods to comprehensively reflect students' performance. However, subjective deviations may exist in evaluation, affecting fairness. Educational measurement points out that the two most important indicators of evaluation tools are reliability and validity. Therefore, clearer and more detailed evaluation criteria should be formulated, more objective evaluation methods should be introduced, and students' growth motivation should be fully stimulated on the basis of ensuring fairness.

Disclosure statement

The authors declare no conflict of interest.

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