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Research on the Educational Tourism Development of Intangible Cultural Heritage: Suitability, Spatial Pattern, and Obstacle Factor

Lin Meng , Fengjuan Yan, Qi Fang and Wentao Si *

School of Public Administration, Shandong Normal University, Jinan 250014, China; menglin@sdsu.edu.cn (L.M.)

* Correspondence: siwentao@sdsu.edu.cn



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Abstract: Combining the Intangible Cultural Heritage and sustainable development has been an important effort of UNESCO since the new century. This study discusses the suitability of educational tourism development of intangible cultural heritage. On the one hand, it was beneficial to improve the comprehensive quality of students; on the other hand, it was conducive to protecting and rationally developing the cultural heritage and avoiding its loss. In this study, an evaluation index system was established according to the analytic hierarchy process, which included two aspects (i.e., intrinsic value and extrinsic conditions) and 16 indices from four criterion layers (e.g., educational value, recreational value, environmental conditions, and relevant facilities and services). Furthermore, we calculated the development suitability and spatial distribution patterns of intangible cultural heritage for educational tourism. At the same time, using the obstacle degree model, the obstacle degrees of each indicator factor were screened and identified to explore the source of obstacles that restrict the suitability of educational tourism development of ICH. Results showed that: (1) The development suitability of intangible cultural heritage for educational tourism was divided into high suitability, middle suitability, and low suitability. A total of 186 intangible cultural heritages were found in Shandong Province, China. Among these intangible cultural heritages, 60 of 186 (32.26%) were low suitability, with values ranging from 0.326 to 0.460; 86 of 186 (46.24%) were middle suitability, with values of 0.460–0.543, and 40 of 186 (21.50%) were high suitability with a range of 0.543–0.689. (2) The spatial distribution patterns of suitability showed that the development suitability of intangible cultural heritage for educational tourism in Shandong Province exhibited a significantly positive spatial correlation that projects with similar suitability levels were clustered into a group and generally distributed with a direction of “southwest to the northeast”. (3) According to the diagnostic results of obstacle factor analysis, from the perspective of the first level indicator, the obstacle degree of the intrinsic value (A1) of the three levels of suitability of ICH was the highest. Among the second-level indicators, educational value (B1) has always been the biggest obstacle factor affecting the educational tourism of ICH, and the relevance of cultural content (C2), representativeness and typicality of the phenomenon (C3), applicability of teaching cases (C4), and uniqueness or rarity (C5) were the greatest among the three suitability factors.

Keywords: intangible cultural heritage; educational tourism; development suitability evaluation; spatial pattern; obstacle factor analysis; sustainable development; Shandong Province; China

1. Introduction

Educational tourism is a kind of activity that takes primary and middle school students as the main objects and collective travel life as the carrier in China. It is a kind of tourism activity that aims at improving students' quality through experiential education and research learning, which is closely related to intangible cultural heritage [1–3]. Intangible cultural heritage (hereinafter referred to as “ICH”) is a record of the human transformation of nature and carries human history and civilization [4,5]. ICH is an important resource

for sustainable development and the most precious embodiment of cultural creativity. Ancestors transformed their imagination of distant and beautiful things into thinking and exploration, ultimately forming a rich and colorful ICH, bringing cultural knowledge, which is a great motivation for today's creation. The integration of ICH into modern life is not only an important concept for the protection of ICH but also in line with the basic laws and characteristics of its own development. Sustainable development is a new concept to solve many contradictions in human development, and the protection of ICH is a new practice to maintain human cultural diversity, as well as to promote cultural equality and intergenerational equity. Combining the two has been an important effort of UNESCO since the new century.

The educational tourism development of ICHs is the reshaping and innovation of traditional culture. By leveraging the educational tourism development of ICHs, it is possible to enhance the public's understanding and recognition of ICHs and promote the protection and inheritance of traditional cultural resources. At the same time, with the educational tourism development of ICHs, it can further promote the sustainable development of the tourism industry, as well as innovate the development forms and channels of the tourism industry [6]. On one hand, integrating ICHs into educational tourism will inject funds into the protection of ICHs, overcome the current unfavorable situation of the shrinking market for ICHs, and help create a modern development environment and living space suitable for ICHs. On the other hand, it is conducive to cultivating the audience of ICHs, awakening the public's awareness of protecting ICHs, and expanding the scope of inheritors of ICHs [7,8].

However, ICHs are limited by their essential characteristics of intangibility, i.e., significant vulnerability and variability, which are easily damaged in the development process [9]. It has been widely believed that tourism development should be carried out based on protecting ICH [10]. The following research viewpoints can support this conclusion. Firstly, specific countermeasures and suggestions are proposed in terms of resource evaluation, market positioning, product development, interpretation system, publicity and promotion, and guarantee mechanism from the perspective of resource utilization [11,12]. Secondly, the development strategy should be carried out based on stakeholders, policy systems, laws and regulations, and product design from the perspective of demand [11,13,14]. Thirdly, the systems should be improved including the tourism management system, infrastructure system, and tourism service system [8]. The existing studies have made many beneficial achievements in the tourism development of ICH, but less attention has been paid to educational tourism development. Based on suitability evaluation, it is of positive significance to the educational tourism development of ICHs. Educational tourism could promote primary and middle school students to understand ICH which may inspire their interest and awareness of ICH protection. Meanwhile, educational tourism is a kind of outdoor learning. At the same time, it has been found that there are still contradictions among stakeholders, protection and development, and development entities, leading to the excessive or unreasonable development of intangible cultural heritage, which, in turn, leads to the destruction of ICH. Therefore, educational tourism is a good way to promote the integration of knowledge from textbooks and life experiences as well as satisfy the increased tourism demand of students. Placing the inheritance of ICH in the context of educational tourism is a new perspective on the inheritance of ICH [15].

Meanwhile, due to their differences in endowment conditions, only some of the ICHs are feasible for educational tourism development [10]. Therefore, it is necessary to select the ICHs with the values of educational tourism development by suitability evaluation. The suitability evaluation of educational tourism development of ICH is conducive to protecting the authenticity of ICHs and accurately identifying the destination of educational tourism [16,17]. The existing studies are similar in research objects, methods, and evaluation indices. Firstly, the research objects tend to be a certain region, i.e., a city, a county, or a kind of ICH, and the whole spatial range (county, city, province, and economic development zone) is regarded as a unit [18–21]. Secondly, the methods are dominated by qualitative analyses [19,22]. Thirdly, the suitability evaluation systems of

educational tourism development of ICH mainly consist of element conditions of ICHs and the destination conditions of educational tourism development [21,23,24]. In addition, most of the selected indices are subjective judgments, which do not apply to a large number of evaluation objects [20,25]. However, in practice, there are a large number and complex types of ICHs in a region. If the suitability evaluation of ICHs regards the whole study area as a unit, some unsuitable ICHs will be developed. Furthermore, the shortcomings of the suitability evaluation of a certain ICH project from a microcosmic perspective are that it will increase the complexity of the work. Meanwhile, many previous studies have also found that there are extensive widespread contradictions among stakeholders, between protection and development, and between development subjects. These contradictions led to the excessive and unreasonable development of ICHs, and then they destroyed ICHs [26,27]. Therefore, it is necessary to comprehensively measure the development suitability of ICHs to realize the inheritance of ICHs and the benign interactive development of educational tourism.

Shandong Province is located in east China, with the Yellow River flowing across the whole province from west to east. Throughout history, countries such as Qi, Lu, Cao, Teng, and Wei have been founded there and have achieved great prosperity. The special geopolitical pattern and profound historical culture provided a good basis for the occurrence and development of ICH. Abundant ICH resources had been produced. The total number of expressions of ICH is 1092, of which 186 are national. At the same time, Shandong is an important education province in China. In 2022, there were a total of 38,700 schools of all levels and types (excluding vocational schools) in the education system of the province, with 22.0885 million students enrolled in various levels and types of education. Among them, there are 7.6062 million students enrolled in primary education, 3.9734 million students enrolled in junior high school education, 53,600 students enrolled in special education, 1.903 million students enrolled in regular high school education, and 881,000 students enrolled in secondary vocational schools.

However, there have been few related types of research to study the suitability of intangible cultural heritage for educational tourism development in Shandong Province. In this study, the analytic hierarchy process (AHP) was used to explore the suitability of educational tourism development of ICH in Shandong Province, China. First of all, from the perspective of intrinsic value–external conditions, the evaluation system for the development suitability of ICHs for educational tourism was constructed. Secondly, the weights of different indices were calculated by the analytic hierarchy process and Delphi method. Thirdly, the suitability of each ICH for educational tourism development was measured by actual data and then graded using the natural breakpoint method. Fourthly, global spatial autocorrelation, kernel density analysis, and the Standard Deviation Ellipse were used to investigate the spatial distribution patterns of ICHs from different suitability levels. Finally, based on obstacle factor analysis, the key factors limiting the development suitability of ICHs for educational tourism were analyzed, and differentiated strategies for ICHs development were proposed.

Compared with previous studies, the innovations of the present study are summarized as follows. Firstly, in the suitability evaluation system of educational tourism development of ICH, we fully considered the intrinsic value and external conditions. In addition to qualitative indices, we also selected some quantitative indices to evaluate the suitability of educational tourism development of ICH in batches, which, in turn, increased the application of the index system in practice. Secondly, we analyzed the spatial distribution patterns of ICHs with different development suitability levels. Thirdly, the research results will be conducive to providing new methods for combining ICH and education, enriching the theoretical achievements of the integration of ICH and tourism development research, as well as promoting the inheritance and protection of ICH. At the same time, it could provide scientific guidance and decision-making basis for local governments to develop ICH educational tourism, boost cultural and tourism consumption, and provide new

impetus for promoting the integration and high-quality development of cultural and tourism industries.

2. The Construction of Suitability Evaluation Systems of Educational Tourism Development of ICH

According to the RMP (Resource-Market-Product) theory, tourism resources include core and peripheral resources. Core resources mainly refer to tourism attractions, while peripheral resources refer to regional tourism facilities and other development conditions [28,29]. At the same time, based on the differences in the quality and attributes of the core tourism resources, the transformation forms between tourism resources and tourism products are different, which can be divided into three types. The first type is resource–product symbiosis. The core attraction of this type of tourism resource is high quality, a unique landscape, and ease of transformation from resources to the product. So, it is called resource–product symbiosis. The second type is resource–product upgrading. The value grade of the core attraction of tourism resources is low, and it is difficult to convert resources into products. Therefore, the quality of tourism products needs to be improved through corresponding capital investment; this is called resource–product upgrading. The third type is the resource–product associated type, including two types. First, core resources include intangible culture and tangible entities, which need to be combined to form products. Second, entities that may not have tourism functions can become tourist destinations only after they have added tourism functions. Both of the types can be called resource–product associations [28,29]. Based on the analysis above, intangible cultural heritage belongs to intangible cultural resources, which need to be utilized by tangible carriers for educational tourism, so it belongs to the type of resource–product associations. At the same time, intangible cultural heritage is passed down by inheritors (or groups) from generation to generation and has the characteristics of single, small-scale, dispersed distribution, the high time cost of resource cultivation and regeneration, difficulty in determining property rights, high investment, and uncertain income [30]. These characteristics determine that the educational tourism development of intangible cultural heritage requires a lot of investment and infrastructure, and the relationship between the two is also resource–product upgrading.

In addition, according to the theory of cultural capital, the transformation of cultural resources into cultural products requires an orderly combination of resource elements and tourism demand [31]. On the one hand, as a special form of resource, intangible cultural heritage has a national, inheritance, variation, and contextual nature that cannot be compared to material and other types of resources. At the same time, it has educational and recreational attributes, making it an important attraction resource in study tours. On the other hand, the development of research and study trips for intangible cultural heritage requires attracting the market and audience, as well as meeting various conditions and services required by the market, in order to achieve social and economic benefits.

Overall, from the perspective of the resource–product relationship, intangible cultural heritage, as a cultural tourism resource, needs to rely on the external environment of development when they are converted into educational tourism products. The evaluation index system should be designed from two aspects, i.e., intrinsic value and external conditions, to measure the suitability of educational tourism development of ICH.

Currently, there is no unified standard for the suitability evaluation of ICHs for educational tourism, and there are great differences in the construction of the evaluation index system. However, common indices can still be extracted from these index systems. Based on the principles of comprehensiveness, scientific objectivity, and operability in the construction of the evaluation index system, we referred to the relevant research results and selected the most referential basic indicators from the two aspects of internal value and external conditions, including 16 indicators in 4 criteria layers, such as educational value, recreational value, environmental conditions, and related facilities and services (Table 1).

Table 1. The suitability evaluation system of ICHs for educational tourism.

First Level Indicators	Second Level Indicators	Third Level Indicators	Direction	Explain
Intrinsic value (A1)	Educational value (B1)	Relevance of scientific knowledge (C1)	Positive	/
		Relevance of cultural content (C2)	Positive	/
		Representativeness and typicality of the phenomenon (C3)	Positive	/
		Applicability of teaching cases (C4)	Positive	/
	Recreational value (B2)	Uniqueness or rarity (C5)	Negative	The number of ICH types to which a certain ICH project belongs/the total number of ICH.
		Suitable tourism period (C6)	Positive	See main text.
		Spatial carrier (C7)	Positive	When calculating the spatial carrier attribute of ICHs, we assigned 1 to ICHs located in villages and modern towns and 0 to ICHs located in other locations.
External conditions (A2)	Environmental conditions (B3)	Demand for educational tourism (C8)	Positive	The number of primary and secondary school students in the area (county) where the ICH was located $E = 0.6 \times e_1 + 0.4 \times e_2$ where E represents the attitude of stakeholders; e_1 represents per capita expenditure on education, cultural and entertainment expenditure; e_2 represents educational expenditure within the general budget of local finance. $F = 0.04 \times f_1 + 0.09 \times f_2 + 0.41 \times f_3 + 0.13 \times f_4 + 0.33 \times f_5$ where F represents ecological carrying capacity; f_1 represents elevation; f_2 represents slope; f_3 represents vegetation coverage; f_4 represents the intensity of soil erosion; f_5 represents biological abundance.
		Attitude of stakeholders (C9)	Positive	
		Ecological carrying capacity (C10)	Positive	
	Related facilities and services (B4)	Educational services (C11)	Positive	$G = 0.6 \times g_1 + 0.4 \times g_2$ where G represents educational services; g_1 represents the number of ICH inheritance education practice bases; g_2 represents the number of educational tourism bases. $T = 0.33 \times t_1 + 0.27 \times t_2 + 0.2 \times t_3 + 0.13 \times t_4 + 0.07 \times t_5$ where T represents transport services; t_1 represents the number of air stations; t_2 represents the number of railway stations; t_3 represents the number of expressways; t_4 represents the number of national highways; t_5 represents the number of provincial roads.
		Transport services (C12)	Positive	
		Accommodation services (C13)	Positive	The number of hotels restaurants and hospitals where ICHs were located in each district (county)

Table 1. Cont.

First Level Indicators	Second Level Indicators	Third Level Indicators	Direction	Explain
External conditions (A2)	Related facilities and services (B4)	Food and beverage services (C14)	Positive	The number of hotels, restaurants and hospitals where ICHs were located in each district (county) $H = 0.6 \times h_1 + 0.4 \times h_2$
		Guide services (C15)	Positive	where H represents guide services; h_1 represents the number of tour guides; h_2 represents the number of inheritors of ICHs.
		Medical assistance services (C16)	Positive	The number of hospitals where ICHs were located in each district (county)

2.1. Intrinsic Value

The intrinsic value refers to the resource endowment characteristics of ICHs as educational tourism resources. Educational tourism is a new model formed by the integration of education and tourism, with the focus on exploring the learning and tourism value of ICH. The combination of tourism and learning is closely related to people's emphasis on lifelong learning. Educational tourism travelers pursue not only the recreational process but also the acquisition of knowledge and self-development during the research process. Currently, educational tourism has been included in the education and teaching plans of primary and secondary schools in China, and its content should be organically integrated with school curriculum, while practical and educational integration should be achieved through tourism [31].

According to the theory of cultural capital, the intangible value of culture itself is transformed into tangible economic value [32,33]. The transformation of cultural resources into cultural products is driven by the endowment of resource elements. The development of educational tourism for ICHs requires factors that can attract the market and audience and generate social and economic benefits in the process of development and extension, so that the industry can continue to thrive. Educational tourism is a new model formed by the penetration and integration of education and tourism. The key point of its development is to tap the value of "learning" and "tour" of ICH. Learning is a process of meaning construction based on context and requires continuous accumulation. Tourism is a contextual activity that allows tourists to construct meaning for themselves and engage in lifelong activities. Therefore, tourism is one of the important means to achieve lifelong learning [34]. Therefore, in this context, travel activities are the carrier, and education is the purpose, both of which are indispensable.

Overall, educational tourism is an off-campus educational activity that combines educational learning and tourism experience [3,35]. Its educational and recreational characteristics highlight the educational and recreational value of educational tourism [36,37]. Therefore, the intrinsic value of the development of intangible cultural heritage research was measured from these two aspects.

2.1.1. Educational Value

Educational tourism has been included in school education and teaching plans in China, and its content should not only be organically integrated with school curriculum but also achieve the integration of practicality and education through tourism. The essence of educational tourism is that education is the end, and travel is the means. As an important lever for promoting the reform of quality education in primary and secondary schools, educational tourism is an extension of classroom education activities outside of school and an organic component of a comprehensive practical education system. Education value is undoubtedly the first principle (Table 1).

In terms of educational value, educational tourism requires students to link the knowledge they have learned with the actual cultural life of society in the process of activities. The theory of embodied cognition holds that the human mind is embodied in the body, and the body is rooted in the environment. The interaction between the brain, body, and environment generates cognition [38]. Educational tourism should emphasize physical participation in learning activities. Therefore, the research and development of intangible cultural heritage should be student-centered, based on the cultural nature of ICH, and construct a practical task of scientific knowledge learning (Table 1).

The integration of scientific knowledge and cultural content is an important feature of educational innovation [39,40], which helps to improve the learning effect. Therefore, the educational value should consider the relevance of ICHs with scientific knowledge and cultural content [36,41]. Among them, the relevance of scientific knowledge refers to the scientific knowledge that can be expanded by ICHs [42]. Relevance of cultural content refers to the historical, aesthetic, and other cultural contents that can be expanded by ICHs [36,41] (Table 1).

At the same time, the scientific and cultural education effectiveness of educational tourism needs to be realized through educational tourism courses. The representativeness, typicality, and applicability of curriculum teaching cases are of great significance to the improvement of teaching efficiency [3,23]. Therefore, the educational value should also consider the representativeness and typicality of the phenomena represented by ICHs, as well as the applicability of transforming them into teaching cases [36,43]. The representativeness and typicality of phenomenon refer to the representativeness and typicality of a certain humanistic phenomenon or process displayed by ICHs. The applicability of teaching cases refers to the applicability of transforming ICHs into teaching cases (Table 1).

2.1.2. Recreational Value

The theory of embodied cognition holds that the human mind is embodied in the body, and the body is rooted in the environment [44]. The interaction between the brain, body, and environment generates cognition. Therefore, the research and learning activities of ICH should emphasize the participation of the body in learning activities and pay attention to mobilizing the dynamic participation of various parts of the body. This requires the educational tourism of ICH to have sufficient recreational value, mobilize students to experience and comprehend themselves in real environments, form emotional impulses, and discover wisdom. In Table 1, the formation of cognition among students is realized through embodied practice (Table 1).

There are many research achievements in the evaluation of recreational value, and its index setting has been mature. “Classification, Investigation and Evaluation of Tourism Resources (GB/T 18972-2017)” is a standard document in China [45]. It is widely used in the evaluation of tourism resources. By referring to the standard document and relevant research results [46], we evaluated the recreational value of ICHs with three indices: uniqueness or rarity, suitable tourism period, and spatial carrier.

1. Uniqueness or rarity

The uniqueness or rarity of ICHs in a region, as a key condition for tourism utilization, will not only affect the quality of educational tourism development of ICH but also affect the experience and perceptual effect of primary and middle school students to varying degrees [46]. The stronger the uniqueness or rarity of ICHs is, the more attractive it is to primary and middle school students. Meanwhile, it is more necessary to carry out educational tourism development to realize the further inheritance and protection of ICHs (Table 1).

2. Suitable tourism period

The suitable tourism period refers to the length of time that ICH can provide for educational tourism. The type of ICH is different, the suitable tourism period will also be different. The folk festival type of intangible cultural heritage takes the time of folk

festival activities as the standard, which is generally calculated as 3 days, so the suitable tour period is 3/365 days. The suitable tourism period of other intangible cultural heritage types mainly refers to the peak tourism period in China (April to October) as the standard. The peak tourist season in China is half a year, which is 182.5/365 days [47] (Table 1).

3. Spatial carrier

According to the theory of human–land relationship, human activities in the regional system of human–land relationship are dependent on spatial carriers, which refer to the background area of the human–land relationship system in a certain region. Different spatial carriers reflect the carrying function and feedback mechanism of natural systems towards human activities, as well as the spatial occupancy and adaptation dependence of human activities on natural systems [5]. Spatial carrier is the intermediary of educational tourism development of ICH which refers to the spatial location of ICHs [28]. According to RMP, intangible cultural heritage is an invisible tourism resource, which can be transformed into tourism products with local characteristics by a certain spatial carrier. At the same time, viewing landscape is the main demand of tourists in the tourism process. Therefore, the ICH resources need to be combined with tangible landscape carriers during the process of educational tourism development. Combined with the classification of land use types in China, the spatial carriers of intangible cultural heritage can be divided into two types: villages and modern towns [47]. Firstly, the preservation and protection of ICHs require spatial integration with local traditional villages to make it a “living culture” that exists in life without being divorced from life. The ancient characteristic architecture, traditional skills, and local folk customs all add attraction to the educational site and promote the protection and utilization of ICHs [48,49]. Secondly, modern towns are densely populated areas with better traffic and tourist conditions. If there are inherited traditional architectural blocks, historical and cultural sites, or time-honored shops in modern towns, especially if there is a cluster area of ICHs in the central urban region, there will be favorable conditions for the educational tourism development of ICH [15]. Therefore, being located in villages and current towns is more conducive to the educational tourism development for ICH. When calculating the spatial carrier attribute of ICHs, we assigned 1 to ICHs located in villages and modern towns and 0 to ICHs located in other locations (Table 1).

2.2. External Conditions

According to the theory of cultural capital, the intangible value inherent in cultural resources can be transformed into tangible economic value [32,33]. As an intangible cultural resource, the prerequisite for an ICH to become an ICH that can generate tourism economic value is to connect relevant services. That is to say, in order for ICH to be transformed into educational tourism products, external conditions need to be utilized to achieve it. By leveraging external conditions, intangible cultural resources of ICH can be reshaped into cultural products. At this point, ICH contains dynamic attributes and regional characteristics, which can form distinctive educational tourism of ICH brands. Secondly, local oriented education (localized education) believes that the curriculum should start from the local environment and teach subject curriculum concepts in the curriculum [50,51]. Different places and local resource and environmental conditions will affect students’ learning experience and thinking. Finally, the tourist destination should provide a good experience of educational tourism while showing tourists the special tourist attractions [28,41]. Therefore, activities of educational tourism need better environmental conditions and related facilities and services [52]. Environmental conditions determine the social acceptability and natural endurance of ICHs for educational tourism [41]. Related facilities and services determine whether the infrastructure of the location of ICHs can serve educational tourism activities.

2.2.1. Environmental Conditions

According to the classic theory of human–land relations, the system of human–land relations can be understood as a unified whole formed by the interaction and influence between the human social environment and natural environment. The natural environment

is a product of natural material development, and the human social environment is not only a product of human social development and the foundation of human activities but also the main content of human social development [5]. In addition, according to the social-ecological system theory, natural ecosystems and human social systems are coupled to form complex dynamic systems that carry human production activities. In summary, environmental conditions indicators for the educational tourism development of ICH are selected from two aspects: social environment and natural environment [53].

1. Social environmental conditions

The educational tourism development of ICH should be based on the demand of primary and secondary school students [39] and take the support of stakeholders as the guarantee [27,54]. Therefore, the social environment conditions were evaluated from the perspective of the demand for educational tourism and the attitude of the stakeholders (Table 1).

Currently, educational tourism in China has become a necessity for students on campus. Educational tourism includes more explanations and courses than regular trips, allowing children to learn knowledge and broaden their horizons. Therefore, the more students there are, the higher the demand for study tours is. Therefore, the demand for educational tourism is measured by the number of primary and secondary school students in the area (county) where the ICH is located [39].

Stakeholder attitude refers to the support provided by the government, the public, and others for the development of research travel. In the educational tourism industry, stakeholders involve the combination of tourism activities and educational purposes, the coexistence of the public welfare attributes of education, and the commercial attributes of enterprises, including the interests of the government and the public. Among them, government departments play a policy guidance and regulatory role. The public participates to a certain extent in the planning and execution of research tours and bears the cost of tourism. Due to the economic expenses required for educational tourism, the government needs to allocate relevant infrastructure to maintain the smooth operation and revenue generation of ICH educational tourism. The public needs to pay a certain amount of fees to meet their children's educational travel needs. In summary, the government and parents' economic expenditures on education and cultural activities reflect their support. Therefore, the higher the per capita expenditure on education, culture, and entertainment is, the more willing the public is for their children to participate in educational tourism. And the more education expenditure is included in the general budget of local finance, indicating that the government is more active in the development of education and supports the development of educational tourism [27,54,55]. The calculation method is shown in Table 1.

2. Natural environmental conditions

The educational tourism development of ICHs will attract a large influx of people. In order to meet the needs of tourists, the government often develops some infrastructure to maintain the operation of tourist areas. The educational tourism development of ICHs could destroy the regional ecological environment [52]. Therefore, it is necessary to comprehensively evaluate whether the natural conditions of the ICH locations are suitable for educational tourism development [41,56]. The ecological carrying capacity was used to evaluate the natural conditions. Ecological carrying capacity is the self-sustaining and self-regulating ability of an ecosystem. It includes the supply and accommodation capacity of resource and environment subsystems, the intensity of social and economic activities they can maintain, and the number of people with a certain standard of living [57]. Ecological carrying capacity limits the utilization intensity of educational tourism of ICH under the premise of ecological protection. The higher the ecological carrying capacity is, the stronger the ability of the region to resist the interference and influence of human activities is, and the more suitable the region is for educational tourism activities. According to the official document "Technical Criterion for Ecosystem Status Evaluation (HJ/T192-2015)" [58] and existing studies, the ecological carrying capacity was comprehensively measured by elevation, slope, soil erosion, vegetation coverage, and biological abundance [59] (Table 1).

2.2.2. Related Facilities and Services

The facilities and services for educational tourism are key factors affecting the long-term development of ICH educational tourism destinations [52]. Firstly, infrastructure is an important component of tourist destinations, which directly affects the tourist experience. High-quality infrastructure can provide tourists with a more comfortable and convenient tourism environment, thereby enhancing their satisfaction and loyalty. Secondly, educational tourism is a comprehensive industry, and its development cannot be separated from the support of infrastructure. Good infrastructure not only attracts more tourists but also promotes the diversified and distinctive development of the tourism industry.

ICH and Throsby's concept of "intangible cultural capital" share a consistent theoretical connotation [31]. The premise for ICH to become cultural capital is to connect related services and accumulate a certain amount of cultural capital (i.e., "cultural added value") through the continuous flow of these related services. Furthermore, 'cultural capital' can be further transformed into 'cultural products' [25]. The cultural product here refers to the value of studying and traveling. Therefore, the development of educational tourism should be fully considered the regional infrastructure and service conditions. "Specification for service on educational tourism" (LB/T 054—2016) [2] issued by the Ministry of Culture and Tourism of the People's Republic of China provided detailed regulations that educational tourism should provide educational services, transport services, accommodation services, food and beverage services, guide services, and medical assistance services. Therefore, we selected indices based on the regulation to evaluate the conditions of related facilities and services. Among these services, the number of hotels, restaurants, and hospitals where ICHs were located in each district (county) was used to represent accommodation services, food and beverage services, and medical assistance services (Table 1).

Educational service refers to undertakers and sponsors that should provide educational service facilities according to the educational objectives of schools [3,60]. The educational tourism bases set up in China can provide good intangible cultural heritage education services for primary and secondary school students. Meanwhile, ICH inheritance education practice bases could provide necessary teaching materials and venues for educational tourism. Therefore, the educational service ability was measured by the number of ICH inheritance education practice bases and educational tourism bases in the region (county) where the ICH is located [61] (Table 1).

The transport conditions of ICHs determined the accessibility of students, which also largely determined the level of ICH resource development [3]. Therefore, the number of provincial roads, national highways, expressways, railway stations, and air stations in each county (city, district) where the ICHs were located were selected as the basis of measurement [47] (Table 1).

In addition, the "Specification for Service on Study Travel" (LB/T 054—2016) [2] requires that the guide services should be mainly provided by tour guides with tourist guide certificates. However, due to the specialization of ICHs, the inheritor of ICHs should provide professional guide services [62]. Therefore, the number of tour guides and inheritors of ICHs was used to measure the level of guide services that intangible cultural heritage provided (Table 1).

3. Methods

In this study, the analytic hierarchy process (AHP) was used to measure the suitability of intangible cultural heritage research travel, while Global Moran's *I* Index, kernel density analysis, and Standard Deviational Ellipse were used to analyze the spatial pattern of the suitability of the educational tourism development of ICH. The obstacle model was used to analyze the obstacle factors in this study of the educational tourism development of ICH. Among them, the AHP is a classic suitability evaluation method that can accurately identify the suitability of each ICH for educational tourism. The spatial pattern can identify the distribution and aggregation points and surfaces of the suitability of the educational tourism development of ICH in space, which is conducive to the scientific development

of the educational tourism development of ICH. The obstacle model can identify the unfavorable factors of the development of obstacle factors based on suitability evaluation and help developers determine the focus and obstacles of development.

3.1. Suitability Analyses

3.1.1. Standardization

As the dimensionality of each index is different, the maximum-difference normalization method was used to eliminate the dimensionality influence and make each index between 0 and 1. Then, the suitability value of each ICH for educational tourism was calculated (Equation (1)).

$$X = \begin{cases} (x_{ij} - x_{imin}) / (x_{ij} - x_{imax}) & \text{Positive index} \\ (x_{imax} - x_{ij}) / (x_{imax} - x_{imin}) & \text{Negative index} \end{cases} \quad (1)$$

where X is the standard value of x_i ; x_{ij} is the original value of x_i ; x_{imin} is the minimum value of x_i ; and x_{imax} is the maximum value.

3.1.2. Analytic Hierarchy Process

In the present study, the analytic hierarchy process (AHP) was used to determine the weight of each index. The analytic hierarchy process is a decision method of multi-level weight analysis, which is a systemic analysis method combination of the qualitative and quantitative methods [63,64]. The calculation of the weights of indices included three steps. First, a pairwise comparison matrix was conducted based on the geometric mean of the questionnaire data at each level, such as the criteria level and index level. Second, to ensure the adaptability and effectiveness of weight values, the consistency test of the matrix was conducted. It aims to test the consistency of decision-makers during their judgment-thinking process. Third, the development suitability values of intangible cultural heritage for educational tourism were calculated. The suitability values of educational tourism development of ICH were:

$$F = \sum_{i=1}^n Q_i Z_i \quad (2)$$

where F is the suitability value of the educational tourism development of ICH, i is the serial number of evaluation index, n is the number of evaluation index, Q_i is the weights of the index i , and Z_i is the value of index i .

3.2. Spatial Distribution Analysis

3.2.1. Global Spatial Autocorrelation

Global spatial autocorrelation is measured by Global Moran's I index. It is used to test whether the adjacent spatial units in the whole study area are correlated [65]. The calculation method was as follows:

$$I = \frac{\sum_{i=1}^n \sum_{j=1}^n W_{ij} (Y_i - \bar{Y}) (Y_j - \bar{Y})}{S^2 \sum_{i=1}^n \sum_{j=1}^n W_{ij}} \quad (3)$$

$$Z(I) = \frac{I - E(I)}{\sqrt{Var(I)}} \quad (4)$$

where I represents Global Moran's I index; n is the number of the district (county or city); i and j represent the suitability values of educational tourism development of ICH in each study unit; W_{ij} represents the spatial weight matrix (If the study unit is spatial adjacent, the value is 1; otherwise, 0); S^2 represents the derivation of ICH suitability for educational tourism development; and $\bar{Y}$ represents the average value of ICH suitability for educational tourism development. The range of I is $(-1, 1)$. $I > 0$ represents spatial positive correlation, $I < 0$ represents spatial negative correlation, and $I = 0$ represents no correlation. $Z(I)$ is

the Z test result of Moran's I , $E(I)$ represents the expected value, and $Var(I)$ represents the coefficient of variation.

3.2.2. Kernel Density Analysis

Kernel density analysis is used to describe the spatial density characteristics and distribution trend of the research objects, which can effectively reflect and check the influence degree of the surrounding areas. In the present study, the dispersal and cluster characteristics of ICHs for educational tourism development at different suitability levels were calculated by kernel density analysis [66]. The calculation method was as follows:

$$f(x) = \frac{1}{nh} \sum_{i=1}^n k\left(\frac{x - x_i}{h}\right) \quad (5)$$

where $f(x)$ is the kernel density value of ICHs in the study area; h is the searching radius; n is the samples; k is the kernel function; and $x - x_i$ is the distance between two ICHs.

3.2.3. Standard Deviation Ellipse

In the study, Standard Deviation Ellipse (SDE) was used to analyze the layout direction of different development suitability levels of ICHs for educational tourism [67]. The barycenter of SDE represents the barycenter coordinates of the factor distributions. The azimuth of SDE represents the angle of factor distribution in the horizontal direction. The calculation method was as follows:

1. Barycenter

$$\bar{X} = \frac{\sum_{i=1}^n w_i x_i}{\sum_{i=1}^n w_i}, \bar{Y} = \frac{\sum_{i=1}^n w_i y_i}{\sum_{i=1}^n w_i} \quad (6)$$

2. Azimuth

$$\tan \theta = \frac{\left(\sum_{i=1}^n w_i^2 \tilde{x}_i^2 - \sum_{i=1}^n w_i^2 \tilde{y}_i^2 \right) + \sqrt{\left(\sum_{i=1}^n w_i^2 \tilde{x}_i^2 - \sum_{i=1}^n w_i^2 \tilde{y}_i^2 \right)^2 + 4 \sum_{i=1}^n w_i^2 \tilde{x}_i \tilde{y}_i}}{\sum_{i=1}^n 2w_i^2 \tilde{x}_i \tilde{y}_i} \quad (7)$$

where n represents the number of study units; x_i and y_i represent the latitude and longitude geographic coordinates of barycenter in each study unit; w_i represents the number of educational tourism development of ICH at different suitability levels; $\bar{X}$ and $\bar{Y}$ represent the weighted average barycentric coordinates; and θ represents the azimuth of the ellipse, which indicates the distribution directions of educational tourism development of ICH at different suitability levels.

3.2.4. Obstacle Degree Model

Using the obstacle degree model, the obstacle degree of each indicator factor was calculated and sorted in order of magnitude, and the key dimensions with a greater degree of obstacle impact were screened and identified to explore the source of obstacles that restrict the suitability of educational tourism development of ICH. The calculation results can provide quantitative basis for scientifically formulating research and development strategies for ICH [68,69]. The calculation method was as follows:

$$F_j = \left[(1 - X_{ij}) w_j / \sum_{j=1}^n (1 - X_{ij}) w_j \right] \times 100\% \quad (8)$$

$$V_j = \sum F_j \quad (9)$$

where the F_j represents the obstacle level of the j th indicator; w_j represents the weight of the j th indicator; X_{ij} is the standardized value of the j th indicator; n represents the number of indicators; and V_j represents the obstacle level of each dimension.

3.3. Data Source and Statistical Analyses

Data on ICHs included information on their formal and expanded projects. National projects included five batches of representative projects and extended information on national intangible cultural heritages in 2006, 2008, 2011, 2014, and 2021. According to the list of Chinese national intangible cultural heritage, ICHs were divided into 10 categories, such as folk literature, traditional music, traditional dance, traditional opera, Quyi, traditional sports, recreation and acrobatics, traditional arts, traditional skills, traditional medicine, and folkways. The spatial location information of ICHs came from the “spatial distribution data of Chinese five batches of 3610 national intangible cultural heritages” in Global Change Research Data Publishing & Repository [70]. In the study, the information from China National Intangible Cultural Heritage Network (<https://www.ihchina.cn/>, accessed on 16 June 2022) was used to correct the spatial location of some ICHs in the dataset.

The suitability evaluation data were collected from field investigation, interviews, and related statistical analyses (Table 2).

Table 2. Data source of the suitability evaluation system of ICHs for educational tourism.

First Level Indicators	Second Level Indicators	Third Level Indicators	Data Sources
Intrinsic value (A1)	Educational value (B1)	Relevance of scientific knowledge (C1)	Data from survey
		Relevance of cultural content (C2)	Data from survey
		Representativeness and typicality of the phenomenon (C3)	Data from survey
		Applicability of teaching cases (C4)	Data from survey
External conditions (A2)	Recreational value (B2)	Uniqueness or rarity (C5)	Calculation
		Suitable tourism period (C6)	Calculation
	Environmental conditions (B3)	Spatial carrier (C7)	https://www.resdc.cn/ (accessed on 16 June 2022)
		Demand for educational tourism (C8)	Statistical Yearbook of each district (county and city) in 2021
		Attitude of stakeholders (C9)	Statistical Yearbook from Shandong Province and each district (county and city) in 2021
		Ecological carrying capacity (C10)	https://www.resdc.cn/ (accessed on 16 June 2022)
	Related facilities and services (B4)	Educational services (C11)	http://www.moe.gov.cn/ ; (accessed on 18 June 2022); http://edu.shandong.gov.cn/ (accessed on 18 June 2022); http://whhly.shandong.gov.cn/ (accessed on 18 June 2022)
		Transport services (C12)	https://www.resdc.cn/ (accessed on 18 June 2022)
		Accommodation services (C13)	https://www.resdc.cn/ (accessed on 18 June 2022)
		Food and beverage services (C14)	https://www.resdc.cn/ (accessed on 18 June 2022)
		Guide services (C15)	Shandong Statistical Yearbook and Statistical Yearbook of each district (county and city) in 2021; https://www.ihchina.cn/ (accessed on 16 June 2022)
		Medical assistance services (C16)	https://www.resdc.cn/ (accessed on 18 June 2022)

1. Subjective evaluation indices (C1–C6) were scored by experts. Indices C1–C6 were divided into 5 levels: excellent, good, fair, poor, and very poor, and each level was given a value. For example, excellent was assigned 5, good, 4; fair, 3; poor, 2; and very poor, 1. Considering the scientific background, we sent 40 questionnaires to experts in geography and tourism. They completed the evaluation based on field investigations and relevant material learning. Finally, 32 valid questionnaires were returned. The average score from the 32 experts was used as the value of each index.
2. Objective indices (C7–C16) were calculated from the data (Table 2).
3. Weights of indices. To avoid the subjective assumptions of researchers and their value preferences, the study selected 40 primary and middle school teachers, geography experts, and tourism experts from the perspective of academic background to send them questionnaires. They completed the scoring by field investigation and relevant material learning. Finally, 31 valid questionnaires were returned.

4. Results

4.1. Results of Suitability Evaluation

The development suitability of ICHs for educational tourism was calculated according to Table 1 and Equation (7). The classification function of Natural Breaks of ArcGIS software (10.2) was used to grade the suitability of educational tourism development of ICH in Shandong Province. The suitability was divided into three levels. Results showed that 40 of 186 ICHs (21.50%) were high suitability, with suitability values ranging from 0.543 to 0.689; 86 (46.24%) were middle suitability, with values of 0.460–0.543; and 60 (32.26%) were low suitability, with a range from 0.326 and 0.460 (Figure 1 and Table 3).

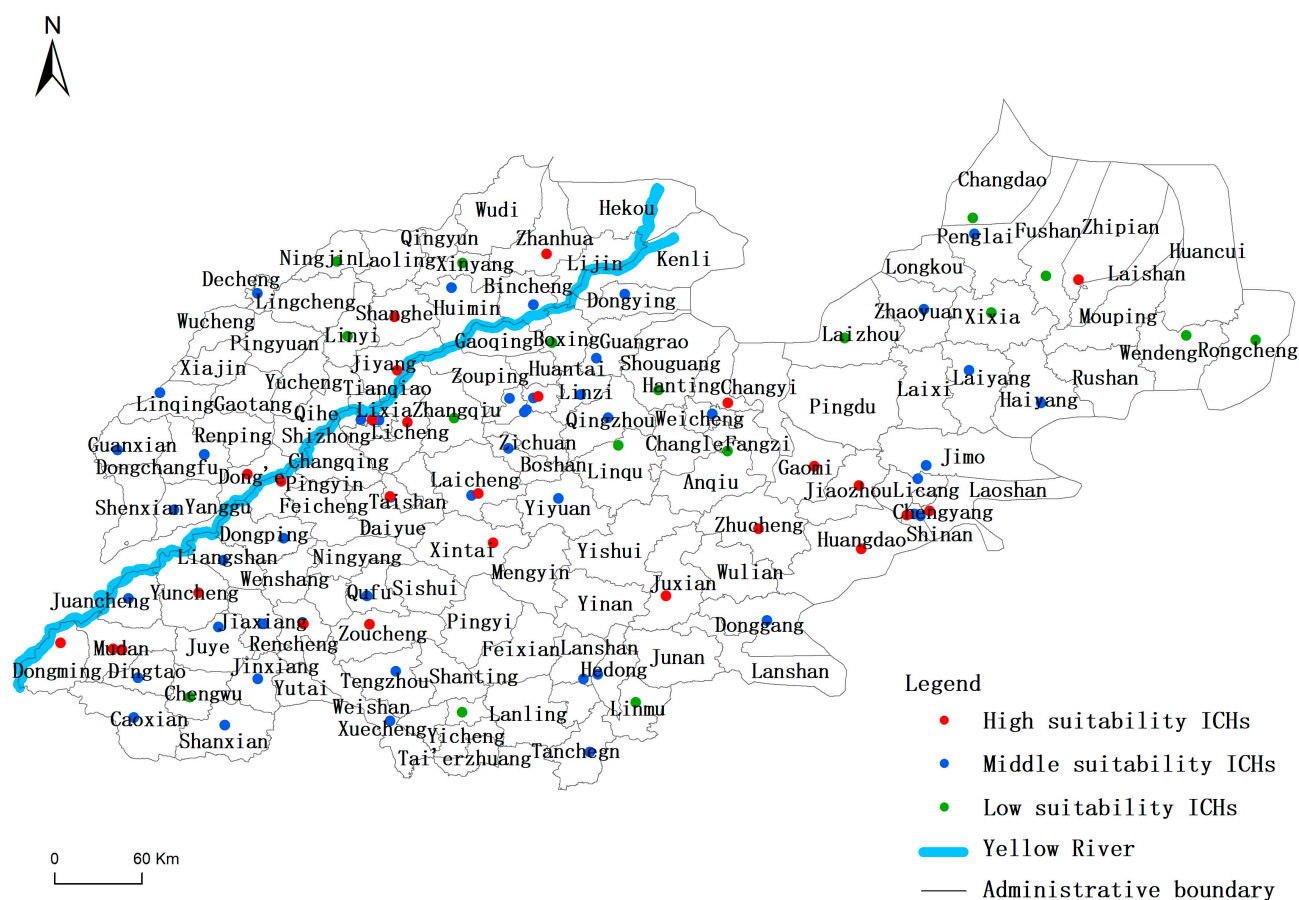


Figure 1. Levels of the suitability of educational tourism development of ICH.

Table 3. Suitability evaluation results of intangible cultural heritage for educational tourism development.

Classification		High Suitability	Middle Suitability	Low Suitability	Total
Suitability Level					
	Traditional skill	2	11	6	19
	Traditional art	3	15	10	28
	Traditional sports, recreation and acrobatics	0	10	5	15
	Traditional dance	3	8	2	13
	Traditional drama	1	18	14	33
	Traditional medicine	6	0	0	6
	Traditional music	6	6	6	18
	Folk literature	9	10	8	27
	Folk custom	1	4	9	14
	Traditional quyi	9	4	0	13
	Total	40	86	60	186

The quantity structure of ICHs at different suitability levels showed significant differences. Among high-suitability projects, the quantity of ICH types from more to less was folk literature, Quyi, traditional music, traditional medicine, traditional arts, traditional dance, traditional skills, traditional opera, folkways, traditional sports, and recreation and acrobatics. Their quantity accounted for 22.50%, 22.50%, 15.00%, 15.00%, 7.50%, 5.00%, 2.50%, 2.50%, and 0.00% of the total number of high-suitability projects, respectively. Among middle-suitability projects, the quantity of ICH types from more to less was traditional opera, traditional arts, traditional skills, folk literature, traditional sports, recreation and acrobatics, traditional dance, traditional music, folkways, Quyi, and traditional medicine. Their proportion to the total number of middle-suitability projects was 20.93%, 17.44%, 12.79%, 11.63%, 11.63%, 9.30%, 6.98%, 4.65%, 4.65%, and 0.00%, respectively. Among low-suitability projects, the quantity of ICH types from more to less was traditional opera, traditional arts, folkways, folk literature, traditional skills, traditional music, traditional sports, recreation and acrobatics, traditional dance, traditional medicine, and Quyi. Their percentage to the total number of low-suitability projects was 23.33%, 16.67%, 15.00%, 13.33%, 10.00%, 10.00%, 8.34%, 3.33%, 0.00%, and 0.00%, respectively. Overall, projects of traditional medicine all belonged to high suitability. Moreover, 67.29% of folkways belong to the low-suitability level, accounting for a high proportion. Other types of ICHs were distributed at the middle-suitability levels (Figure 1 and Table 3).

4.2. Spatial Analysis of Suitability

4.2.1. Global Spatial Autocorrelation Analysis

Results of global spatial autocorrelation showed that the value of Moran's I was 0.508 (>0). The z value was 7.032 ($p < 0.01$), indicating that the random probability of the suitability index of educational tourism development of ICH in spatial $<1\%$. The values of Moran's I and z both illustrated that the suitability of intangible cultural heritages for educational tourism development in Shandong Province exhibited significant and positive spatial correlation. These indexes showed that projects with high suitability and low suitability formed the same type of regional spatial agglomeration (Figure 2).

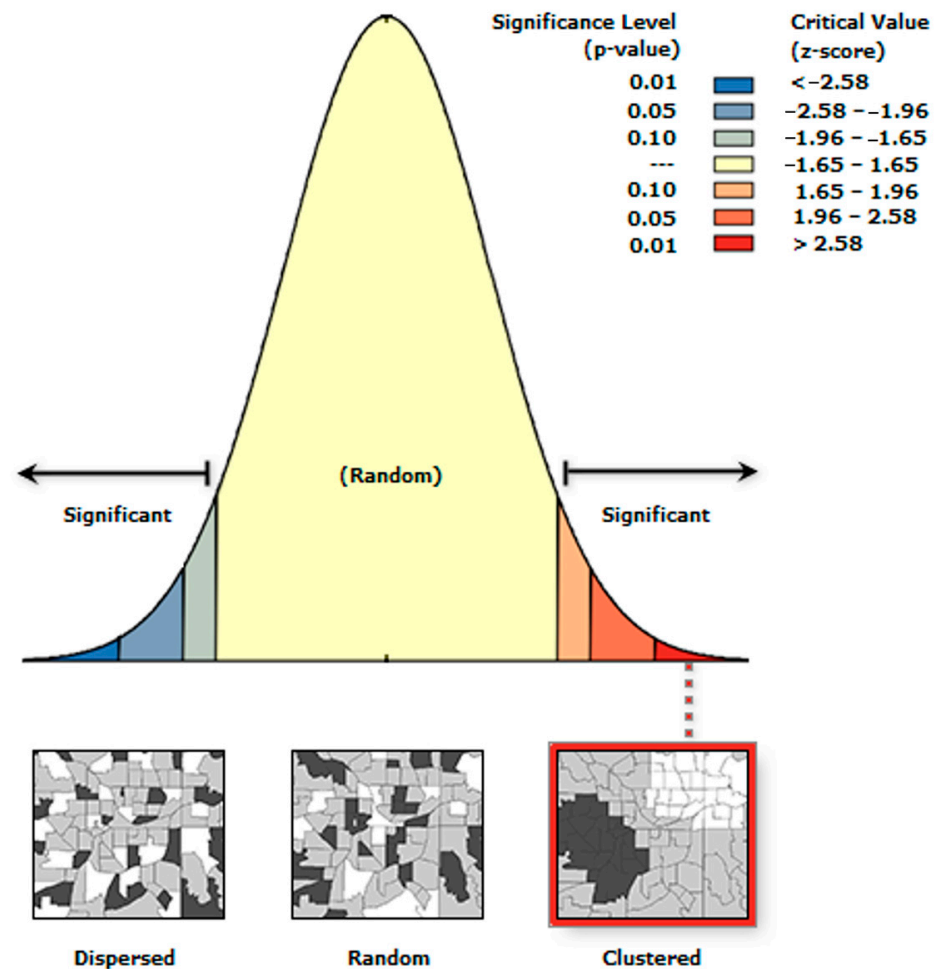


Figure 2. Global spatial autocorrelation.

4.2.2. Kernel Density Analysis

Results of global spatial autocorrelation analysis showed that the suitability of educational tourism development of ICH had spatial clustered characteristics. To further explore their spatial clustered characteristics, kernel density analysis was added. Results showed that the spatial distribution of suitability exhibited a significant difference. The clustered characteristics of different levels and regions had obvious differences.

1. Distribution patterns of high-suitability projects

High-suitability projects were distributed in groups with obvious clustered characteristics (Figure 3a). The three most clustered areas were Mudan District, Lixia District, and Taishan District with seven, four, and four high-suitability projects of ICHs, respectively. In addition, there were four sub-cluster areas, including Ju County, Zhifu District, Huangdao District, and Zoucheng City, with two high-suitability projects of ICHs, respectively.

2. Distribution patterns of middle-suitability projects

The distribution of middle-suitability projects was spatially dispersed (Figure 4b). They were mainly distributed in Mudan District, Taishan District, Qufu City, Lixia District, Laicheng District, Zhangdian District, Jiayang County, and Dongchangfu District with six, five, four, three, three, three, three, and three middle-suitability projects, respectively. Moreover, there were eight sub-cluster areas, which were distributed in Gaomi City, Laoshan District, Jimo City, Zichuan District, Bincheng District, Shan County, Huaiyin District, and Kuiwen District with two middle-suitability projects (Figure 3b).

3. Distribution patterns of low-suitability projects

The low-suitability projects were mainly distributed in Boxing County, Laizhou City, Jiaxiang County, Cao County, Dingtao District, Guan County, Juancheng County, Linqing City, Linzi City, Anqiu City, Chengwu County, and Xixia City (Figure 3c). Furthermore, there were three low-suitability projects of ICHs in Boxing County and Laizhou City, and two in every other region (Figure 3c).

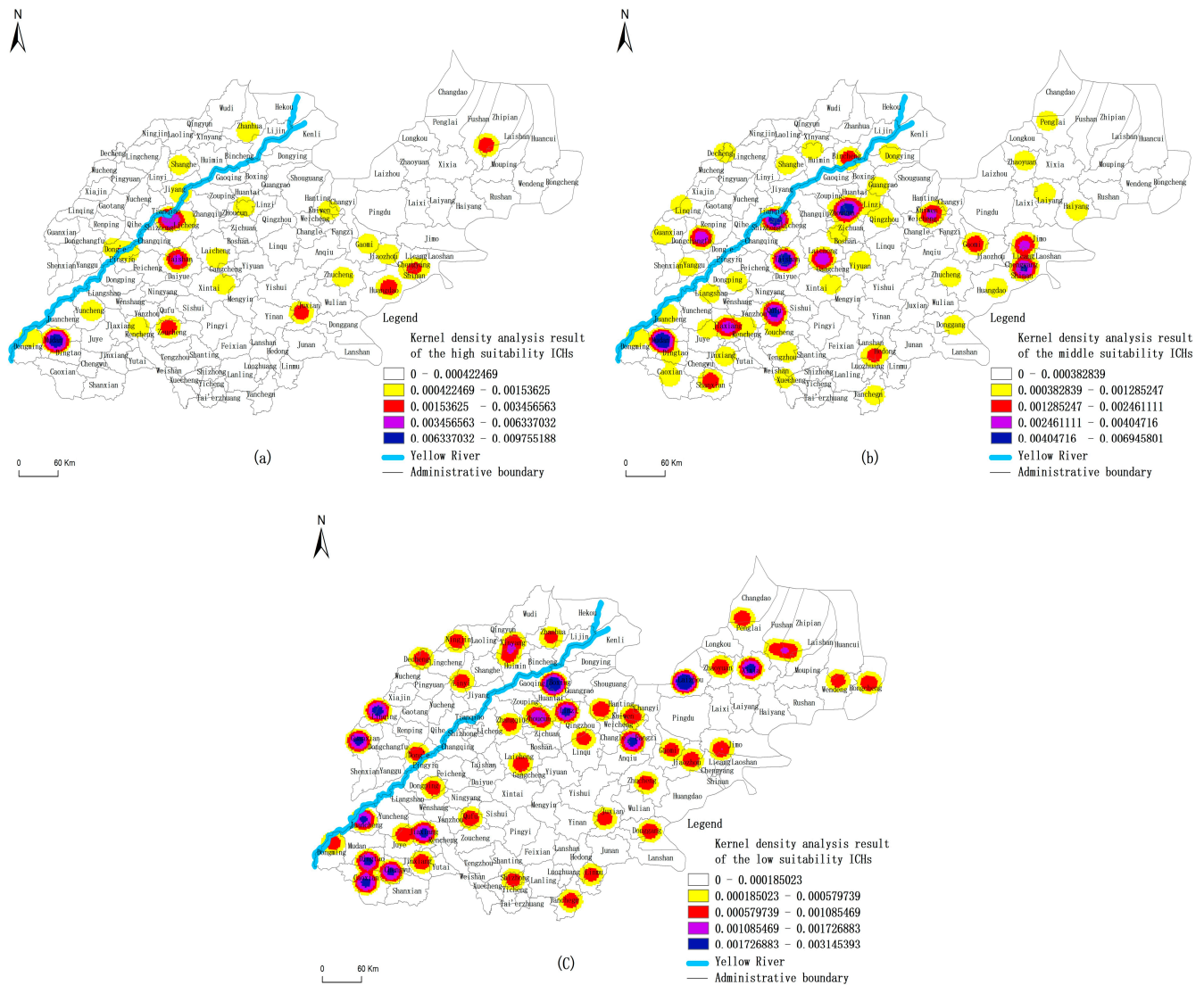


Figure 3. Results of the kernel density analysis. (a) High suitability of educational tourism development of ICH; (b) middle suitability of educational tourism development of ICH; (c) low suitability of educational tourism development of ICH.

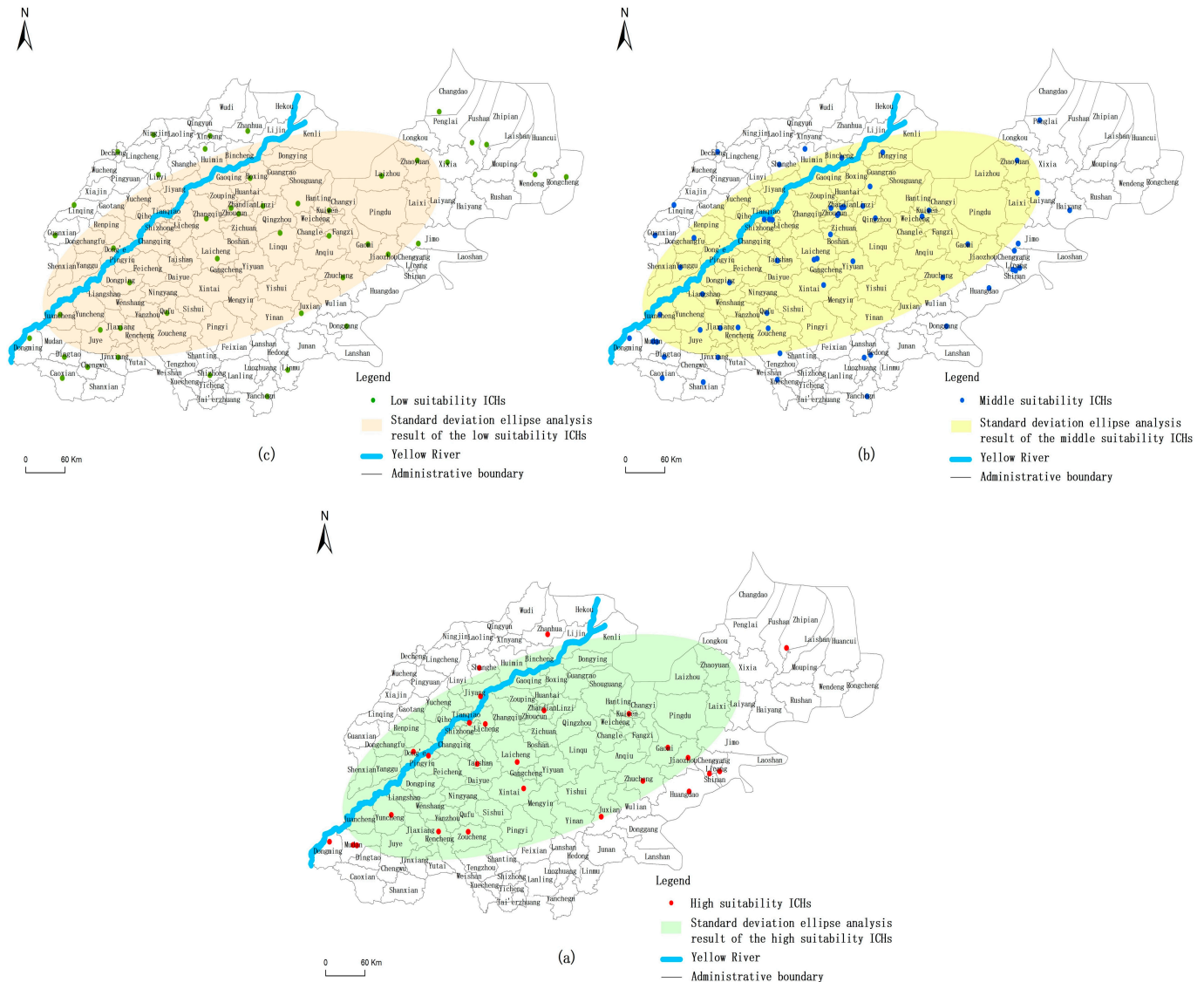


Figure 4. Results of the standard deviation ellipse. (a) High suitability of educational tourism development of ICH; (b) middle suitability of educational tourism development of ICH; (c) low suitability of educational tourism development of ICH.

4.2.3. Standard Deviation Ellipse Analysis

Results of the standard deviation ellipse analysis showed that the distribution centers of different suitability levels of ICHs in Shandong Province were located in the middle of the province. The range of the standard deviation ellipse showed that high suitability < middle suitability < low suitability, indicating that high suitability generally had higher agglomeration. The elliptic azimuth of high suitability, middle suitability, and low suitability was 64.99° , 63.07° , and 59.23° , respectively. All the elliptic azimuths were distributed in a direction of “southwest to the northeast”. Furthermore, the long axis of the standard deviation ellipse was significantly distributed along the Yellow River (Figure 4).

4.2.4. Obstacle Factor Analysis

By calculating the average obstacle level of the suitability indicators for educational tourism of various ICH in Shandong Province, it was found that the intrinsic value (A1) of ICH had a higher obstacle level than the external conditions (A2) (Table 4).

Table 4. Average obstacle degree of the suitability indicators of educational tourism development of ICH.

F-L-I	Obstacle Degree (%)				S-L-I	Obstacle Degree (%)				T-L-I	Obstacle Degree (%)			
	W-R	H-S	M-S	L-S		W-R	H-S	M-S	L-S		W-R	H-S	M-S	L-S
A1	0.32	0.42	0.36	0.26	B1	0.25	0.29	0.26	0.18	C1	0.05	0.06	0.05	0.03
										C2	0.07	0.09	0.08	0.05
										C3	0.06	0.06	0.06	0.04
										C4	0.07	0.08	0.07	0.06
					B2	0.07	0.13	0.1	0.08	C5	0.06	0.06	0.06	0.04
										C6	0.01	0.02	0.00	0.00
										C7	0.01	0.01	0.00	0.00
A2	0.22	0.21	0.23	0.19	B3	0.11	0.11	0.11	0.11	C8	0.04	0.04	0.04	0.04
										C9	0.03	0.03	0.03	0.03
										C10	0.04	0.04	0.04	0.04
					B4	0.11	0.1	0.12	0.08	C11	0.02	0.03	0.02	0.02
										C12	0.02	0.02	0.02	0.02
										C13	0.01	0.02	0.01	0.01
										C14	0.01	0.01	0.01	0.01
										C15	0.02	0.02	0.02	0.02
										C16	0.02	0.00	0.04	0.00

Note: A1 means intrinsic value. A2 means external conditions. B1 means educational value. B2 means recreational value. B3 means environmental conditions. B4 means related facilities and services. C1 means relevance of scientific knowledge. C2 means relevance of cultural content. C3 means representativeness and typicality of the phenomenon. C4 means applicability of teaching cases. C5 means uniqueness or rarity. C6 means suitable tourism period. C7 means spatial carrier. C8 means demand for educational tourism. C9 means attitude of stakeholders. C10 means ecological carrying capacity. C11 means educational services. C12 means transport services. C13 means accommodation services. C14 means food and beverage services. C15 means guide services. C16 means medical assistance services. F-L-I means first-level indicators. S-L-I means second-level indicators. T-L-I means third-level indicators. W-R means whole region. H-S means high suitability of educational tourism development of ICH. M-S means middle suitability of educational tourism development of ICH. L-S means low suitability of educational tourism development of ICH.

In the dimension of intrinsic value (A1), the obstacle level of educational value (B1) was significantly higher than that of recreational value (B2). In educational value (B1), relevance of cultural content (C2), applicability of teaching cases (C4), and representativeness and typicality of the phenomenon (C3) were ranked in order of obstacle degree, all of which were greater than 10%. In the recreational value (B2), the obstacle degree of uniqueness or rarity (C5) was 10.75%, which was significantly higher than the other two indicators. Meanwhile, the obstacle level of the spatial carrier (C7) was the smallest. In addition, by comparing the obstacle values of different development suitability levels and suitability indicators, it was found that in terms of intrinsic value (A1), in descending order of obstacle levels, the ICHs were ranked as low suitability, middle suitability, and high suitability. Among them, the obstacle values' ranking of educational value (B1) and recreational value (B2) was the same as above. In the third-level indicators, the greatest obstacles of educational value (B1) were the relevance of cultural content (C2) and the applicability of teaching cases (C4). The biggest obstacle degree of recreational value (B2) was uniqueness or rarity (C5).

In the dimension of external conditions (A2), there was not much difference in the degree of obstacles between related facilities and services (B4) and environmental conditions (B3). Among them, the obstacle levels of various indicators of environmental conditions (B3) were all above 5%, while the obstacle levels of various indicators of related facilities and services (B4) were all below 5%. In addition, by comparing the obstacle levels of different development suitability levels and suitability indicators, it was found that in terms of external conditions (A2), in descending order of obstacle levels, the ICHs were ranked as middle suitability, low suitability, and high suitability. Among them, the three suitability levels of environmental conditions (B3) had the same degree of obstacle, and the highest

level of obstacle indicators were the demand for educational tourism (C8) and ecological carrying capacity (C10). The highest obstacle level of related facilities and services (B4) was the middle suitability of ICH, and the lowest was the high suitability of ICH. Among the third-level indicators of related facilities and services (B4), educational services (C11) had the highest obstacle degree in low suitability, medical assistance services (C16) had the highest obstacle degree in middle suitability, and there was not much difference in the third-level indicators of obstacle degree of high suitability.

5. Discussion

5.1. The Suitability of Educational Tourism Development of ICH

The research results indicate that not all ICH were suitable for educational tourism. There were only 40 items that were most suitable for research and educational tourism development, indicating that ICH needs to be developed in protection to avoid damage caused by excessive development. The research results are consistent with those of Melis, Zhang, and others [6,71]. Melis believed that the importance of ICH for tourism has been well documented, and ICH is also acknowledged as an important tourism asset, is increasingly included in portfolio strategies, but the fragility of ICH cannot be ignored. Zhang believed that ICH could make tourists' evenings more interesting and induce more consumption, and tourism managers who have the highest power and final decision-making rights could develop strategies to improve stable and efficient ICH production. Although the development of educational tourism can give vitality to ICH, it can also destroy the originality and development laws of ICH, leading to excessive commercial development. This will harm the inheritance and protection of ICH and slow down the development of tourism. Currently, China's research on ICH mainly focuses on inheriting skilled and skilled ICH, just like folk literature, traditional drama, traditional art, traditional techniques, traditional quyi, and traditional music, which are highly and moderately suitable for development.

Firstly, due to its unique geographical environment and historical culture, Shandong has a rich content of folk stories, which is of great significance for primary and secondary school students to understand the social customs, thoughts, and ethnic colors of different eras. Shandong is one of the famous birthplaces of Qilu culture in ancient times. After the establishment of the State of Lu in BC, Shandong became the cultural center of Qilu. Later, it went through the rule of dynasties such as Lu, Wei, Jin, Qi, Liang, Tang, and Song, leaving behind rich stories of celebrities and folk legends. For primary and secondary school students, such ICH can enable them to have a deeper understanding of local customs, thoughts, and culture. Based on these folk literature resources, educational tourism can be carried out.

Secondly, traditional drama, traditional music, and traditional quyi are important components of Chinese national culture, possessing artistic and charming performance forms that are loved and appreciated by the people. Rich local resources such as drama, music, and folk arts are concentrated in Shandong, including projects such as Liuqin Opera, Shandong Qinshu, and Shandong Guzheng Music. Teenagers can learn through educational tourism, appreciate singing and performance, understand the process of evolution and artistic characteristics, and perceive aesthetic and artistic value. Therefore, the development of educational tourism of these ICH is of high suitability.

Thirdly, both traditional art and traditional skill belong to the category of ICH with high technological content and suitable for research and learning. Due to the ease of mastering these skill-based ICH projects, this type of ICH has the highest proportion in the activities of ICH entering the campus and curriculum. Due to its historical location in the Yellow River Basin, Shandong has a prosperous culture and a thriving handicraft industry. The folk have preserved a large number of precious handicrafts and traditional art works, which have been passed down from generation to generation, becoming precious national and regional wealth. Teenagers can participate in specific categories of ICH craft and art educational tourism, learning exquisite ethnic handicrafts and perceiving traditional

Chinese aesthetics. Based on the corresponding resources, inheritors, and venues of ICH in Shandong Province, it is possible to consider developing arts and crafts educational tourism products.

5.2. Spatial Distribution Patterns of Suitability

The study found a suitability distribution pattern of “point-line-surface”, which is consistent with the viewpoint of Li et al. [61]. Li proposed to lay out “points” to ensure the overall layout and construction of research and learning bases, to connect “lines” to do a good job in the development and design of educational tourism routes throughout the area, and to form the educational tourism development strategy that connects “points” and “lines” to achieve the integration of educational tourism in the entire area. The research results on the spatial clustering characteristics of the suitability of intangible cultural heritage research travel support Li’s research conclusion.

5.2.1. Kernel Density Analysis

The results of kernel density analysis on the suitability of educational tourism development showed that Mudan District, Lixia District, and Taishan District are high-suitability and middle-suitability gathering areas, which are mainly distributed along the Yellow River. The average suitability of ICH in the three regions is relatively high, with values of 0.556, 0.597, and 0.549 respectively, all higher than the average of Shandong Province (0.481).

There are numerous ICH projects in Mudan District, with a total of 11 having high and middle suitability for educational tourism development. In recent years, Mudan District has explored ICH resources and folk culture deeply and has coordinated the development of the Boge Folk Culture Museum, Caozhou Porcelain Carving Art Museum, Juyang Qinsuo Museum, and Li Xiaopu Noodle Sculpture Art Museum; the Mudan District has also established a civilized practice exhibition belt of ICH. At the same time, the ICH Archives and Data Room, Heritage Data Database, and Precious Physical Exhibition Hall in Mudan District have been established, and the handcrafted themed ICH study tour for the study of porcelain carving art in Mudan District has been created. Therefore, it has become a high- and middle-suitability gathering area for ICH educational tourism.

Lixia District is a region with a long history and rich cultural heritage, ranking among the top in terms of both quantity and quality of intangible cultural heritage in Shandong Province. Firstly, the ICH Protection Center of Lixia District uses ICH as a carrier, and through various forms such as excavation, sorting, and research, combined with the “online+offline” model, has launched normalized ICH teaching courses in some primary and secondary schools. In 2021, a total of 63 courses were completed. Outside of the course, volunteer services for the inheritance of ICH among students, such as the “Youth Talk on Intangible Cultural Heritage”, as well as online activities such as the “Intangible Cultural Heritage Cloud Classroom”, have been carried out multiple times, allowing students to experience the charm of ICH firsthand. Secondly, in Lixia District, the integration of traditional cultural skills and modern commercial elements has been highlighted, such as creating a landmark area of Tianxia Spring City, promoting the construction of Baihuazhou Intangible Cultural Heritage Park, and developing a series of intangible cultural heritage themed educational tourism. In 2022, more than 1000 students from schools such as Shanshi Affiliated Middle School, Licheng No. 2 Middle School, Shanda Experimental High School, Xicheng Experimental High School, and Changqing Experimental High School experienced ICH projects such as Shadow Puppetry, Wire Cutting Enamel, Curium Porcelain, and Pottery. They visited Baihuazhou and the Zhao Shutang Traditional Chinese Medicine Museum, making sachets and hawthorn pills. Therefore, the foundation of ICH educational tourism in Lixia District is relatively good.

Taishan District is the core area of Mount Taishan Cultural Inheritance and Development Demonstration Zone established in Shandong Province. In Taishan District, ICH of Mount Taishan culture has been integrated into the urban planning and design, and platforms such as the historical and cultural blocks of Tai’an ancient city and the interna-

tional cultural big data (Mount Taishan) industrial city have been established, providing good external conditions for the research of ICH. In addition, there are six research and learning bases in Taishan District, including three provincial educational tourism practice education bases and three municipal educational tourism practice education bases, which can accommodate 2000 primary and secondary students at the same time. At the same time, the green channel for research and learning has been set up in Taishan District, which can provide one-stop services for research and learning teams, such as passenger vehicles, cableways, accommodation, catering, etc. In addition, educational tourism projects, such as Mount Taishan Intangible Cultural Heritage, Mount Taishan Water and Land Painting, Mount Taishan Rubbings, Dawenkou Ceramics, Mount Taishan God Tofu, Mount Taishan Paper Cuttings, Mount Taishan Shadow Play, etc., have been developed. Therefore, Taishan District is very suitable for educational tourism of ICH.

5.2.2. Standard Deviation Ellipse Analysis

The research results indicate that the standard deviation ellipse of different suitable levels developed of ICH for educational tourism is significantly distributed along the major axis of the Yellow River, indicating that ICH projects are mainly concentrated along the Yellow River coast. This is consistent with the research findings of Wang and Nie that since ancient times [7,72]. Wang proposed that the density of inland river networks, abundant water resources, and rainfall have laid a solid foundation for the life and reproduction of early human beings and the diffusion, communication, integration, and dissemination of various cultures, so the spatial distribution of ICH is closely linked to and better coupled with the river system. Nie proposed that the Yellow River gave birth to fine Chinese traditional culture, witnessing a brilliant civilization. Therefore, water bodies have been an important material foundation for human production and life, affecting human settlement and the distribution of ICH. Water bodies can provide water for people's daily life and production, and the flat terrain and high soil fertility in areas formed by river impacts provide a material basis for production activities. Therefore, the more active cultural activities are in areas with abundant water resources, the more ICH there is. The Yellow River is a large river located in northern China, one of the world's longest rivers, and the second longest river in China. Due to the extensive production and living activities of humans along the Yellow River, many ICH resources have been created, resulting in a clear distribution of the standard deviation ellipse along the major axis of the Yellow River.

5.3. Obstacle Factor Analysis

According to the diagnostic results of obstacle factor analysis, from the perspective of the first-level indicator, the obstacle degree of the intrinsic value (A1) of the three levels of suitability of ICH was the highest. Among the second level indicators, educational value (B1) has always been the biggest obstacle factor affecting the educational tourism of ICH, and the relevance of cultural content (C2), representativeness and typicality of the phenomenon (C3), applicability of teaching cases (C4), and uniqueness or rarity (C5) were the greatest among the three suitability factors. There may be several reasons for this.

Firstly, educational tourism is a form of educational tourism, which aims to make education the main purpose of tourism in the context of ICH. Education is the primary characteristic of ICH educational tourism products, and the development of related products should also follow the principle of "education first". Therefore, educational value has become the primary factor restricting the educational tourism development of ICH. On one hand, research on ICH education in China started relatively late, and there are significant theoretical issues related to the knowledge system, value system, and disciplinary system construction of ICH education. Moreover, there is still a need to transform the theory of ICH education into practice, while updating and improving the theoretical system of ICH education in practice, in terms of issues such as ICH education and student cultivation, ICH education and the development of creative cultural industries, ICH education and international cultural exchange and dissemination, and the coordination between family,

school, and society in ICH education. The lack of accurate understanding of the educational value of research tours in schools, as well as a lack of in-depth research and reflection on the goals and themes of ICH educational tourism, has led to the problem of valuing travel over learning, prioritizing travel over learning, and even not learning. On the other hand, in the actual planning of ICH educational tourism, most schools only treat ICH educational tourism as ordinary spring and autumn travel activities, treating educational tourism as a simple “activity” and ignoring the essence of “curriculum”. The lack of accurate understanding of the educational value of educational tourism in schools, as well as a lack of in-depth research and reflection on the goals and themes of ICH educational tourism, has led to the problem of valuing travel over learning, prioritizing travel over learning, and even not learning. Therefore, vague goals and themes of ICH educational tourism can easily lead to students being unable to clearly understand the purpose and significance of ICH educational tourism, resulting in a significant reduction in the educational significance of educational tourism.

Secondly, the exploration of the relevance of cultural content (C2) of ICH is superficial. In China, most of the educational tourism of ICH only teaches superficial, superficial, and static cultural knowledge currently. For the sake of time and safety, in many educational tourism programs, the entire grade or school participates simultaneously, with activity numbers ranging from hundreds to thousands. Such a large team entering the ICH space will inevitably be crowded, and it is inevitable to enter in stages and batches. In order to shorten the time, study tours often involve simple experiential activities. Students have only a partial understanding of the culture of ICH and do not understand its underlying meaning. In this situation, the inheritance of ICH can only be a simple learning of knowledge and skills, without truly internalizing and delving into the spiritual world of students, resulting in a lack of cultural value identification among students, and their cultural consciousness and subject consciousness cannot be awakened.

Thirdly, the representativeness and typicality of the phenomenon (C3) and applicability of teaching cases (C4) are insufficient. Firstly, although the current educational tourism of ICH in China combines educational ideas and local culture, and the development methods and values of ICH courses have also been deeply considered, there is a lack of in-depth development of ICH teaching cases from a theoretical perspective. This leads to the inability to extract a relatively scientific and stable theoretical framework and practical operation process of the curriculum, and the development of ICH educational tourism cases remains more at the level of summarizing practical experience. Secondly, in terms of specific curriculum construction and practice, the setting of curriculum objectives neglects the inherent characteristics of ICH. And in many places, educational tourism courses only focus on creating educational characteristics, thus neglecting the subjectivity of students. Finally, in practical operation, course designers often lack an understanding of ICH and do not have time to fully communicate with inheritors. In addition, some ICH experiential activities require a lot of consumables, which will increase the funding of educational tourism activities, leading to the avoidance of some high-cost ICH courses in the selection of educational tourism courses. Therefore, the representativeness and typicality of the phenomenon (C3) and applicability of teaching cases (C4) have become obstacles to the educational tourism development of ICH.

Fourthly, the uniqueness or rarity (C5) of ICH research products is insufficient, and the phenomenon of homogenization is severe. When ICH educational tourism is developed, due to insufficient understanding of local ICH, developers only make simple copies of similar types of ICH, failing to explore and extract deeper cultural connotations of ICH. Neglecting the creation of individual characteristics in ICH has led to a high degree of similarity or even similarity in ICH educational tourism products. Especially in the form of ICH educational tourism, visiting the production process of ICH products, appreciating the production handicrafts of ICH, and other sightseeing tours are still the main contents. Educational tourism activities are monotonous and lack innovative thinking. This kind of educational tourism not only has a monotonous form but also does not bring practical

benefits to students or audiences. It can also cause aesthetic fatigue for tourists and fail to meet the personalized needs of the market.

5.4. Policy Recommendations

The suitability of the educational tourism development of ICH varied greatly, showing strong spatial imbalance. To avoid repeated and disordered development, different strategies should be raised accordingly. Thus, the following strategies from four aspects were proposed.

1. ICHs with high suitability should be developed first in the educational tourism design. First, the local government should protect the current high-suitability ICH and form the educational tourism brand by mining their educational tourism featured resource. Second, all local governments should comprehensively analyze the current situation of the region, identify the most advantageous key points for the research tourism development of ICH, and pay attention to the degree of emphasis for the development of different types of ICH. For example, high-suitability ICH was grouped mainly along the Yellow River. Therefore, ICH educational tourism routine could be designed based on Yellow River culture. Third, the development ability of ICH educational tourism could be upgraded according to the educational tourism design and facility system. For example, enhancing education investment, designing education courses, setting up an education supervisor team, and constructing an education base could help to construct an education system. Fourth, the educational tourism development of ICH could be promoted by the cultural industry. For example, by extracting the industrial resources and cultural values of ICHs to create an industrial cultural museum, unique industrial educational tourism resources can be formed.
2. Obvious imbalance among elements was shown in ICHs with middle suitability which should be carefully developed. First, in terms of educational tourism development, the local government should take the higher-suitability areas as a reference and find out the obstacles to the development of educational tourism. Meanwhile, ICH in the low ecological capacity areas should be skipped to avoid environmental destruction. Second, the educational value of ICHs should be enhanced; notably, the relevance of scientific knowledge, relevance of cultural content, and the representativeness and typicality of the phenomenon should be enhanced. For example, specialized and targeted educational tourism courses design can be carried out in combination with schools, cultural associations, cultural centers, museums, cultural protection units, and other organizations and places. ICHs with middle suitability could be mixed with courses that can enhance the protection awareness of ICHs for primary and secondary school students. Third, cross-regional education cooperation could be set up by integrating ICHs in the different regions since middle-suitability ICHs are sometimes gathered in the grouped area. The exploitability could be enhanced in the middle-suitability area after integrating an ICH educational routine and course.
3. ICH with low suitability showed a significant difference compared with high suitability ICH in both intrinsic value and extrinsic conditions. Therefore, ICH with low suitability should be selectively explored after protection. First, to avoid the blind exploration of ICH that is not fit for education, it is necessary to determine ICH that could be explored based on ICH resource conditions before exploration. Second, since ICHs have a certain regional representation, ICH educational tourism development can be combined with other educational tourism resources in the region to strengthen cooperation with local or surrounding areas. Third, to improve the attitude of the public and government towards ICH educational tourism development, the government should enhance the social advertisement that focused on quality-oriented education and cultural inheritance. For example, the publicity of ICH is carried out by holding ICH achievement exhibitions and introducing ICH into schools, so as to expand the influence of ICH on the public.

6. Conclusions

In this study, the analytic hierarchy process was applied from intrinsic value and extrinsic conditions. Overall, 16 indexes from educational value, recreational value, environmental conditions, as well as related facilities and services, were selected to construct the evaluation system for educational tourism development suitability of ICHs. Educational tourism development suitability was divided into different levels based on the evaluation result, and the spatial distribution pattern was analyzed at each level. Based on obstacle factor analysis, the key factors limiting the development suitability of ICHs for educational tourism were analyzed. We found that: (1) The educational tourism development suitability of ICHs in Shandong Province could be divided into high suitability, middle suitability, and low suitability. The suitability value of 0.543–0.689 was high suitability, including 40 ICHs, accounting for 24% of the total. The suitability value of 0.460–0.543 was middle suitability, including 86 ICHs, accounting for 51% of the total. The suitability value of 0.326–0.460 was low suitability, including 60 ICHs, accounting for 36% of the total. (2) The spatial distribution analysis of educational tourism development suitability of ICHs showed that an obvious positive spatial correlation existed. ICHs in different suitability levels grouped together showing a “southwest-northeast” distribution pattern. (3) According to the diagnostic results of obstacle factor analysis, from the perspective of the first-level indicator, the obstacle degree of the intrinsic value (A1) of the three levels of suitability of ICH was the highest. Among the second-level indicators, educational value (B1) has always been the biggest obstacle factor affecting the educational tourism of ICH, and the relevance of cultural content (C2), representativeness and typicality of the phenomenon (C3), applicability of teaching cases (C4), and uniqueness or rarity (C5) were the greatest among the three suitability factors.

In terms of research methods, the combined method of the analytic hierarchy process, spatial pattern, and the obstacle degree model in this article can help developers judge the possibility of the educational tourism development of ICH from the perspectives of adaptability, agglomeration status, and unfavorable factors. These methods are not only applicable to the development of educational tourism development of ICH but can also provide reference for the tourism development of ICH or for the development of educational tourism of parks, libraries, material cultural heritage, and other categories.

In this study, the suitability, spatial pattern, and obstacle factor of the educational tourism development of ICH were explored. However, due to limitations in time, space, and data, only Shandong Province was selected as the case area. Further improvement of the indicator system of suitability evaluation and the selection of China as a case study area for the educational tourism development of ICH require further in-depth research.

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