

An Analysis of the Exploration and Practice of Developing Research and Study Activities in Small and Medium-sized Museums in Sichuan



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Abstract: At present, museum research and study activities in Sichuan Province are being continuously carried out. Local museums combine with schools by taking advantage of the characteristics of their collections, and conduct a series of courses and teaching practice activities both inside and outside the museums. Based on the actual situation, this paper explores how small and medium - sized museums in our province can give full play to their resource advantages, as well as some practical problems in the research and study construction of these museums. The purpose is to promote small and medium - sized museums in our province to integrate into the education system with high - quality teaching support services, and to improve the development and upgrading of these museums in our province, and establish a long - term mechanism for students to learn through museums. Thus, the unique role of museums in enhancing students' knowledge and literacy can be fully exerted.

Keywords: Museums; Regional Linkage; Digital Application; Mode Innovation

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1 Introduction

Since the "Opinions on Promoting Research - based Travel for Primary and Middle School Students" issued by 11 departments including the Ministry of Education in 2016 has been continuously implemented in Sichuan Province, museums across the region, in line with their

actual conditions and planned schedules, have collaborated with local primary and secondary schools to launch a series of off - campus practical learning activities that integrate research - based learning with travel experiences [1-12]. According to the statistics of the Department of

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Culture and Tourism of Sichuan Province, by the first half of 2024, there were 463 museums of various types in the province. Among them, a large number of museums are small and medium - sized museums distributed in districts and counties. How can we make use of the resources and development potential of small and medium - sized museums all over the province to promote broader cooperation between museums and schools, enabling students to put down their textbooks and enter the exhibition halls to obtain a more high - quality and intuitive knowledge experience? How can we innovate the research - based learning model to meet the needs of the current era? How can we solve various problems in the service construction of small and medium - sized museums to promote the two - way development of the educational and service functions of museums and the knowledge and cultural literacy of students? We need to continuously explore in the process of solving the actual problems of museum research - based learning, and find a path of museum - school integration education that is more extensive, of higher quality, more long - lasting and more mature, and that is in line with the actual situation of our province.

2 Advantages That Small and Medium-sized Museums in Sichuan Province Can Exert

2.1 Cultural Advantages of Sichuan Province

Sichuan Province is one of the important cradles of Chinese civilization, boasting a profound cultural heritage. The cultural resources across the province are characterized by wide distribution, diverse categories, and rich connotations. Sichuan is one of the birthplaces of Taoism in China, the cradle of the ancient Shu civilization, and the place where the world's earliest paper currency, "Jiaozi," emerged. Sichuan brocade and Sichuan shadow puppetry have been inscribed on the UNESCO Intangible Cultural Heritage List. Sichuan's salt - industry culture and wine culture have a long history. The Three Kingdoms culture, the Red Army culture, and the Ba people culture are all fascinating. In particular, the ancient Shu civilization represented by Sanxingdui and Jinsha Site is resplendent and mysterious. There are 262 national - level

key cultural relics protection units and 1,214 provincial - level cultural relics protection units in the province. Moreover, there are 153 items on the national representative list of intangible cultural heritage and 1,132 items on the provincial intangible cultural heritage list. Small and medium - sized museums in various places also possess cultural and tourism resources with a relatively low regional repetition rate, covering different eras and fields. They can integrate local characteristics, build local brands, attract long - term popularity, transform "internet - famous" attractions into "ever - popular" ones, and formulate sustainable plans for research and study activities. With the development of the times, teenagers have access to a wide variety of cultural products and gradually pursue diverse rather than single cultural and creative products. It is necessary to fully understand and try to combine the aesthetics and trendy cultural and entertainment methods of contemporary young students, innovate a variety of museum research and study products that meet the diverse and novel needs of teenagers, and stimulate their interest in participating in research and study practical activities.

2.2 Regional Advantages of Sichuan Province

Small and medium - sized museums in Sichuan Province are widely distributed in areas with significant regional influence such as Chengdu, Nanchong, Guangyuan, Bazhong, and Guang'an, as well as regions near provincial borders. Geographically, it is close to large - scale cities in central and western China like Chongqing, Xi'an, Wuhan, and Kunming. This geographical advantage is conducive to the development of research and study activities and the regional linkage of museum - school cooperation both within and outside the province, promoting multi - dimensional cross - regional cooperation among different types of museums and schools, such as "museum - to - museum" and "museum - to - school" cooperation. Chengdu and Deyang, relying on the policy advantages of synchronous development, have established a mechanism where large museums assist small and medium - sized museums, and vigorously carried out cross - regional cooperation among small and medium - sized museums (Report Meeting on the Pilot Work of Improving Small and Medium - sized Museums and Experience Exchange Meeting on the Construction of Site Museums by the Sichuan Provincial Bureau of Cultural

Relics). For example, the Sichuan - Chongqing Museum Alliance held a symposium and exchange meeting. As of May 2024, the number of alliance member units reached 119, and regular cooperation in the field of research and study has been carried out. The two regions are aiming at new development directions, promoting the supply - side structural reform of museum research and study services, establishing an open and diversified service supply system, and sharing the scientific research achievements of regional small and medium - sized museums and the practical experience of integrating museum - school cooperation into the education system. There are a large number of museums in the province, covering a wide variety of types and a vast geographical area. Each local museum has experience in carrying out research and study activities based on local conditions. Extensively promoting regional linkage through museum - to - museum and museum - to - school cooperation can not only break through the geographical limitations of research and study activities from implementation to participation but also provide a large - scale data information communication and sharing platform for museums and schools in the province. This can pool the strength and professional experience of multiple parties to concentrate on solving the practical difficulties in the development of museums in some areas.

2.3 Market Advantages of Sichuan Province

In the past two years, the research and study market in Sichuan Province has been extremely hot. Since July 2024, the search popularity of "research and study" - related tourism on the Tongcheng travel platform has increased by 203% month - on - month. According to the data provided by the Ctrip platform, the number of people booking study tour and research and study products during the summer vacation has nearly doubled year - on - year (Chengdu Municipal Government: The tourism market welcomes the "hottest summer season", and research and study in Chengdu is booming). For example, during the eight - day Spring Festival holiday at the beginning of the year, the number of visitors to the Wuhou Shrine Museum in Chengdu reached more than 750,000. Other museums were also almost full every day during the holidays, and it was even "hard to get a ticket". Judging from the data, there are 152 museums in Chengdu, accounting for approximately 33% of the province's total,

the highest proportion among single cities in the province. Since 2022, in order to improve the museum system, our province has introduced policies such as "one museum per county".

The government provides certain economic support for newly - built small and medium - sized museums, and continuously broadens the funding sources for these museums. For example, special funds for the development of small and medium - sized museums have been set up, and precise support policies such as tax incentives, preferential land policies, and financial support are implemented for them. Cultural development funds for the cultural and creative industries have been established, and efforts are made to guide social donations and sponsorships. Based on maintaining their basic operations, these museums can continuously upgrade their construction by integrating high - level scientific and technological resources, service resources, and human resources within the province. They can also continuously improve their internal institutions, digital construction levels, collection quality, as well as their academic and aesthetic values, so as to establish brand characteristics and industry popularity. With high - level research and study services, they can optimize their functions, transform and upgrade, and give full play to their social and teaching functions to achieve long - term development.

3 Explore and Innovate the Development Model of Research and Study Programs in Museums

3.1 Starting from "Home" to Unblock the Key Links of Research - Based Learning

Although students should be the main participants in museum [1-4] - based research - based learning, the opinions of families often play a crucial role in students' participation in such activities. A large proportion of students in the province live in counties and towns. Except for some students in higher grades, most students need parental accompaniment to participate. Currently, research - based learning mainly focuses on primary and secondary schools. Therefore, parent - child research - based learning is the main force among the participating

groups. Thus, small and medium - sized museums should not only focus on cultivating students' new learning method of museum - based research - based learning but also popularize the practical significance of carrying out such activities among parents.

Small and medium - sized museums should first conduct science popularization and publicity among parents of students, and launch various forms of parent - child participation activities. For example, there are parent - child research - based learning routes with expert guidance, such as exploring Sanxingdui, Jinsha Site, and the Ancient Shu Road. Some literary and artistic activities that parents can participate in for free can be carried out, and traditional culture experience classes that require strong practical operation ability and in which parents and children can learn together can be organized. By fully enhancing parents' sense of experience and participation in museum - based research - based learning activities, and making them understand the importance of such activities in cultivating children's learning awareness, parents can be more encouraged to support their children to participate in and engage in research - based learning practical activities, so as to enhance students' desire for knowledge exploration and cultivate their critical and creative thinking abilities. The Sichuan Provincial Museum has provided many experiences for small and medium - sized museums to draw on, such as activities like "Children's Shu Embroidery Parent - Child Experience Class", "National Treasure Little Detectives", and "Six - day Study Tour of Bashu Culture in Chengdu".

However, in the actual implementation of activities, small and medium - sized museums should also consider the economic affordability of most families. The research - based learning activities carried out by many large museums are expensive, making many parents "shy away". These activities do not truly benefit the general public. Therefore, small and medium - sized museums in our province can take advantage of their wide distribution and close connection with the public to launch affordable and popular parent - child research - based learning activities that can be participated in nearby. It is necessary to "increase the quantity" to meet the research - based travel needs of a large number of families in the province, and help relieve the embarrassing situation in the provincial capital during peak seasons when research - based learning activities are overcrowded, with "tickets hard to get" and "it's difficult to enter a class". At the same time, it is also necessary to "improve the quality" by providing

some high - quality activities that parents are satisfied with and from which children can truly learn.

3.2 Breaking the Boundaries of Research - Based Learning Dimensions

3.2.1 Breaking Distance Restrictions

Although many students from well - off families can travel long distances to museums around the country for on - site research and study activities [3-6], getting up - close to cultural relics in the collections, there are still a large number of students in our province who live in areas with inconvenient transportation and relatively backward economic conditions, such as Liangshan and Ganzi in western Sichuan. How can we increase the participation of these students in research and study activities, introduce them to new learning methods, and enable them to share the fruits of the development of museum - based research and study? Digital technology provides many answers.

Since 2018, led by various universities and technology companies, the Starry Sky Project, which unites numerous museums, was officially launched. By establishing rural love libraries and integrating VR technology, local children can view the collections of museums around the country without having to travel across mountains and rivers, realizing an "online tour" of museums.

At the same time, museums can also take the initiative to enter schools. For example, in 2021, the Provincial Museum held the "The Great Heritage: Cultural Relics Exhibition of the Eight Great Prose Masters of the Tang and Song Dynasties" at Qianyang Town Central Primary School. Using 54 exquisite exhibition boards, it displayed various cultural relics related to "the Eight Great Prose Masters of the Tang and Song Dynasties" to the students. By carrying out the "Mobile Museum" touring exhibition activities, cultural relics are brought into the campus. Through popular science lectures, interactions between experts and students, etc., students can be exposed to historical culture up - close, allowing students in some remote schools to also share high - quality cultural resources.

3.2.2 The Starry Sky Plan

The "Starry Sky Plan" has been continuously facilitating the digital innovation and development of small and medium [5-8] - sized museums in our province. By join-

ing the "Starry Sky Plan", small and medium - sized museums build digital platforms in four aspects: museum mini - programs, video accounts, digital cultural and creative products, and "digital cultural heritage museums", thus establishing their digital positions. During the construction of several museums in Ziyang City, such as the Anyue Stone Carvings Museum, scientific and technological means like sound, light, and electricity are rationally applied to create "immersive" and "interactive" viewing experiences.

In terms of improving the service level of small and medium - sized museums, digital technology can provide more detailed cultural relic information for students participating in research and study. Through 3D scanning and modeling, combined with CG animation demonstrations and VR technology, a 1:1 digital model of the real object can be designed. Students can remotely control and "touch" the virtual cultural relics, enhancing the interactive experience of remote research and study exhibitions. This approach also overcomes the shortcomings of one - way information output on traditional platforms like Douyin, such as long update cycles, low update frequencies for new works, lack of user feedback, and insufficient interactivity. It achieves "multi - dimensional co - exhibition, accessible at any time". Moreover, it can recreate historical scenes, offering students a time - transcending experience of different eras. The "Starry Sky Plan" can assist small and medium - sized museums in our province in the development of cultural and creative IPs. By connecting with top domestic and international cultural and creative design teams, it conducts special product designs for the cultural and creative IPs of small and medium - sized museums in our province, synchronizes the concept of cultural and creative consumption, and creates unique IPs for these museums.

3.3 Multimedia Co-construction Online

With the continuous popularization and application [9, 10] of mobile social media among primary and secondary school students, small and medium - sized museums in our province can utilize the different communication methods of various social media platforms to expand their communication channels and develop research - based learning services targeted at student groups. For example, on its WeChat official account, the Sichuan Provincial Museum not only offers various reservation activities such as audio guides, VR real - person explanations, and lectures, but also has an online VR exhibition hall. Stu-

dents can visit different exhibition halls online through the mobile WeChat official account. By categorizing the museum collections, students can quickly and comprehensively understand different types of collections.

The Sanxingdui Museum has also launched digital services such as intelligent customer service, real - person interpretation, and digital cloud exhibition halls, which can meet the remote visit needs of primary and secondary school students. The Former Residence of Zhu De scenic area combines aerial photography, scenic area maps, and virtual cloud technology, integrating the internal and external scenery of the scenic area buildings. High - quality shooting and virtual technology have greatly improved the picture quality and freedom of online viewing. Accompanied by real - time voice explanations, visitors can have an immersive online visit to the former residence.

In addition, small and medium - sized museums can also open official museum accounts on currently popular social platforms with relatively low communication costs, such as Bilibili, Douyin, Kuaishou, Weibo, and Xiaohongshu. They can launch a series of online teaching videos, exhibition works, live interpretation broadcasts, audio guides, service guides, and other featured activities tailored to the communication characteristics of different media for students. In this way, students can participate in museum - based research and study without leaving home.

3.4 Integration of AI Large Models

Small and medium - sized museums can also introduce AI technology [11, 12]. For example, the WeChat mini - program "Musepedia" developed by the scientific and technological innovation team of East China Normal University has developed a knowledge - challenging question - answering game about in - museum exhibits. By using the software to further search for challenging questions and collection - related questions, "Musepedia" can utilize natural language processing algorithms to enable the model to quickly and accurately extract answers from a vast amount of literature. This can guide students to delve deeper into questions and stimulate their interest in cultural heritage knowledge. (East China Normal University: East China Normal University students develop AI - guided tour, which "understands" museums well) At the same time, by applying AI technology, it is possible to analyze students' interest types and habits during research and study activities, and then optimize the content and implementation methods of research and study activities,

and recommend personalized and interest - compliant content to students. AI technology can also be applied to link cultural relics with their relevant literature databases, pictures, videos, research results, etc. Students can obtain more comprehensive information such as the source of materials through AI technology, improving learning efficiency. In the museum, AI intelligent technology can be used to provide intelligent audio guides, robot or robot customer service tour guides to guide visitors to tour the museum, answer questions raised in real - time, and provide the required information.

4 Some Problems and Suggestions Regarding the Current Research and Study Activities in Museums

4.1 Excessive Disparity in Museum Distribution: Areas with Students But Without Adequate Museums

Among different small and medium - sized museums in our province, due to the influence of various factors such as urban location, the distribution of cultural and tourism resources within the province, regional educational distribution, and the level of the tourism market, there are still significant gaps in the development of small and medium - sized museums in different regions and the levels of research and study activities carried out. In terms of the number of museums, the province has more than 460 various museums. Except for Panzhihua, Suining, Neijiang, and Ziyang, 13 cities have more than 10 museums, and more than 150 museums are concentrated in the urban area of Chengdu, generally distributed in a radial pattern. However, considering the distribution of students across the province, there is a large gap in the matching degree between the number of museum distributions and the student data of each city, resulting in uneven geographical distribution of research and study resources. According to the population (student) statistics of various counties and cities in Sichuan Province in 2023 and the list of museums in Sichuan Province, Neijiang City has 605,475 students and 7 museums; Ziyang has 523,580 students and only 3 museums; Suining City has 548,216 students and only 9 museums. Nanchong City has 1,060,153 students, approximately half of that in Cheng-

du, but only 19 museums. It can be seen that the distribution of museums in our province is positively correlated with the distribution of cultural and tourism resources. Cities with underdeveloped small and medium - sized museums, such as Ziyang, Suining, and Nanchong, lack the impetus for museum development due to insufficient tourism resources and markets. Therefore, in some urban areas of our province, the development of small and medium - sized museums poorly matches the actual level of educational development, and actually far from meeting the demand for carrying out research and study practical activities nearby.

In response to the distribution disparities, schools with a large number of students in various regions can fully rely on local resources and collaborate with neighboring areas to appropriately carry out cross - regional museum - school cooperation. Flexibly plan long - distance research and study activities during holidays to break the situation where a small number of museums prevent the implementation of research and study. Museums located in resource - scarce areas can give full play to the advantage of a large local student population, utilize the existing collections to extend the research - study chain, launch diverse, highly extendable, and sustainable research and study activities, and create local research - study characteristics. Small and medium - sized museums in regions rich in cultural and tourism resources can take advantage of local funds, technical talents, further enhance the digital level, and promote the sharing of regional research - study resources.

4.2 The Uneven Quality of Digital Research and Study

Although there are a large number of small and medium - sized museums in Sichuan Province, which are widely distributed, many of them are still relatively backward in the utilization of digital technology. Due to financial constraints, some small and medium - sized museums choose not to provide free online research and study and exhibition - viewing services, but only offer traditional offline ones to maintain the economic operation of the museums. Some museums do provide paid cloud - viewing and commentary services. However, apart from the necessary management and maintenance staff, most small and medium - sized museums lack technicians proficient in network technology and online operation. For example, some small and medium - sized mu-

seums have not opened official websites, official social media accounts and other social media platforms, or the overall activity level of these platforms is very low, and it is almost impossible to update them continuously. The popularity of these museums is still limited to the surrounding residents and students from nearby schools, and the audience is very limited. Although most small and medium - sized museums have certain collection resources, they still do not have the ability to popularize cloud exhibition halls, and there are no dedicated digital research - study channels. As a result, students' research - study activities are still limited to offline visits to the museum. In practical applications, the convenience of digital research and study and the teaching utilization rate of museum collection resources are higher than those of offline research - study activities.

Government management departments in various regions should attach importance to the development of museum - based research and study, foster a sense of responsibility, actively assist local small and medium - sized museums facing difficulties, improve laws and regulations, and provide financial and technical support for the digital applications of these museums. Meanwhile, they can act as a communication bridge to facilitate the cooperation between non - governmental organizations and enterprises with relevant technologies and small and medium - sized museums, and support the digital construction of small and medium - sized museums from multiple aspects.

Each small and medium - sized museum should fully strengthen its own construction, improve its management and salary systems, enhance the treatment of high - tech talents, fully mobilize the enthusiasm and initiative of the museum staff in their work and creation, attract and retain professional talents, and boost internal development impetus. The museum management should also formulate systematic, scientific, and long - term plans for the application of digital research and study to ensure the scientific nature and continuity of digital applications.

4.3 Shortage of Talents

Most small and medium - sized museums in the province are restricted by funds. They cannot offer the good salary and promising career development prospects as large museums do. As a result, most graduates majoring in cultural heritage and related information technology fields have a low willingness to choose small and medium - sized museums. In the current personnel structure of

small and medium-sized museums, the proportion of talents with relevant professional backgrounds is relatively low. Most positions are still limited to traditional ones such as managers, cleaners, tour guides, and docents.

In terms of professionalism, most of the current employees in small and medium - sized museums do not have an educational background in cultural heritage. Thus, they are unable to carry out highly professional tasks such as the collection, arrangement, research, preservation, and restoration of cultural relics. Regarding cultural knowledge, most small and medium - sized museums lack academic staff with professional subject knowledge and research backgrounds corresponding to their museum collections. Most of the existing non - professional docents are not competent for positions that require a large amount of knowledge reserves, such as interpreting the background and impact of complex historical events, the historical connections of museum collections, the meaning of artworks, and scientific principles for students at various stages.

In terms of digital applications, small and medium - sized museums lack software engineers and designers who can develop digital research and study platforms such as websites, software, blogs, mini - programs, and maintain the operation of these digital platforms. Some small and medium - sized museums outsource digital project development to cope with the shortage of in - house professionals. However, it is still difficult for in - house employees to maintain the daily operation, and platform updates are slow. In terms of using new media platforms for publicity and dissemination, most small and medium - sized museums have no more options than leaving their contact numbers on the Internet.

Regarding the design of research and study activities, there is a shortage of employees who know how to innovatively design such activities. Most small and medium - sized museums have not designed research and study activities that suit the museum's situation, regional cultural conditions, and regional educational circumstances. Instead, they copy and adapt mature solution models, merely changing the appearance. They only carry out research and study activities in form to meet policy requirements, rather than truly educating people through the museum.

In response to the current shortage of talents in small and medium - sized museums, each small and medium - sized museum should strengthen the training of existing staff. Meanwhile, it should improve the salary and benefits of employees with relevant professional skills to

enhance their willingness to work. It can cooperate with universities for internships in history and cultural heritage majors, encourage university students to intern in the museum, and promote cooperation and communication between students and existing docents to improve the professionalism of interpretation work. It should also strengthen the cultivation of academic talents and the construction of academic teams in the museum to provide high - quality and professional interpretation services.

The government can also support the development of small and medium - sized museums through policies and talent introduction. It can increase the staffing of professionals in small and medium - sized museums according to their actual workload and attract talents to work in these museums through policies. Moreover, the government can make full use of professional and technical personnel who have retired or are approaching retirement age in the cultural heritage system to form business work groups. These groups can be sent to small and medium - sized museums, tackle problems intensively, and adopt a one - museum - one - strategy approach. Over a period of two to three years, they can help small and medium - sized museums improve their professional capabilities.

5 Conclusion

In today's context, promoting research and study activities in small and medium - sized museums represents the development trend of museum - based research and study. The distribution advantages of small and medium - sized museums can fully make up for the blind spots in the research and study coverage of large museums. They can also fully explore the characteristic cultural and tourism resources of their regions, provide high - quality and diverse research and study service activities, and offer strong impetus for the development of museum - based research and study in our province. Although there is still a significant gap between small and medium - sized museums and well - established large museums in digital construction in our province, the application of digital research and study in small and medium - sized museums is an inevitable trend. Each small and medium - sized museum should seize the opportunities of the times, coordinate with various parties, and jointly build with combined efforts to overcome practical problems such as financial difficulties and talent shortages encountered in the construction process. By doing so, they can promote the

service upgrade of museums, provide more high - quality research and study activities, and integrate into the education system of our province with a high - level research and study service capacity.

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