A Study on the Design of the Activity Center for Left-Behind Children in Cailin Village of Hunan in China

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Abstracts

This Article aimed to study (1) explore the design of an activity center for left-behind children in Cailin Village, Hunan Province, to meet the diverse needs of the area. (2) Left-behind children in the village need a safe, enjoyable, educational, and humanistic activity place to meet their needs for growth and development. (3) Designing an activity center that provides comprehensive support and rich experiences is essential to improving their quality of life. This study adopted a mixed research methodology, including a literature review, a questionnaire survey, and semi-structured interviews, to collect data on the needs of left-behind children. It analyzes the needs and current situation of left-behind children and the current shortages and problems of left-behind children's activity spaces.

The research results were found as follows: (1) It is found that Chinese left-behind children have four types of needs for activity spaces: emotional, educational, social, and recreational. (2) According to the specific needs, four design strategies are proposed: 1) emotional space based on emotional communication; 2) activity space based on functional composite; 3) educational space based on humanistic inheritance; and 4) recreational space based on getting close to nature. The design and construction of activity centers for left-behind children in rural areas will likely provide a valuable reference to meet the needs of this particular group and promote their comprehensive development and healthy growth.

Keywords: The Design of the Activity Center; Left-Behind Children; Cailin Village; China

Introduction

Research background

Hunan Province is a province in central China where left-behind children are prevalent in rural areas (Fan et al., 2010). As a rural village in Hunan Province, Cailing Village faces the severe challenge of left-behind children. Left-behind children lack parental accompaniment at home for an extended period for reasons such as their parents or guardians going out to work (Jiyu, 2015). They may face psychological, educational, and social difficulties due to long-term living alone at home, which affects their healthy growth and development (Jian & Wei, 2022).

The Hunan provincial government and relevant social organizations have been working to solve the problem of left-behind children, and building activity centers for left-behind children is an excellent way to do so. These activity centers aim to provide left-behind children with a safe, warm, and beneficial learning and recreational environment (Zhiqiang et al., 2013), and provide them with resources such as learning tutoring, psychological support, sports activities, and social interactions to make up for their lack of family companionship (Hu et al., 2014).

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Literature Review

The researchers compared data published in the CNKI and WOS databases over ten years and found "left-behind children" in China but not other countries.

The environment is critical to children's growth, and the multiple-space environment can help the growth of left-behind children (Xiaojing, 2018). There are two aspects of functional and cultural symbiosis (Keke, 2019). In order to promote the all-round development of left-behind children (Shuo, 2019), combined with China's proposed urban and rural development, the construction of rural children's activity spaces and the use of pastoral natural resources are necessary to create a rural pastoral experience space suitable for children (Wangwang, 2021). Using natural experience as the starting point, combine natural experience with rural children's behavioral and psychological characteristics (Jiali, 2018). Rural outdoor activity environment and left-behind children's psychological needs and behavioral characteristics. In the context of the rural landscape, it is necessary to focus on regionality, emphasize guidance, increase interest, highlight ecology, and improve the outdoor activity space of left-behind children (Dong et al., 2018). General rural children's outdoor activity spaces are seldom artificially designed, lack apparent cultural and educational features, and cannot play the role of humanistic education for children (Jianyong & Xiaopeng, 2019). By analyzing children's physiological, psychological, and behavioral characteristics, their outdoor activity space needs are clarified, and a child-friendly outdoor activity space design strategy is proposed from the perspective of human care (Xin et al., 2022).

The design of rural left-behind children's activity centers should focus on the needs of left-behind children for space, the current environmental conditions of rural activity centers, and the lifestyle of rural left-behind children(Jiyu, 2015). The left-behind children's activity space should have a design that can interact, accompany the children's growth, and entrust the care of their parents so that the left-behind children will no longer feel lonely (Jingjing, 2016). Aiming at the similarities and differences in the psychological development of children in the lower grades and those in the upper grades, grasp the spatial form, spatial scale, color, material, light environment, and spatial elements of furniture and furnishings of various public activity spaces (Luofeng & Jiayin, 2018). The design of the left-behind children's activity center should be consistent with traditional architecture and should condense traditional architectural symbols and integrate local architectural symbols with modern technology (Feifan, 2017).

Research Objectives

1. Explore the current situation and problems of left-behind children in rural Hunan, understand their social, educational and emotional needs, and provide a basis for designing a suitable activity center.

2. Explore the design of suitable activity spaces and propose design strategies according to the needs.

3. design suitable activity center programs aimed at improving left-behind children's social skills, education and emotional health, and providing strong support for their growth and development.

Research Methodology

Study area selection

The study was conducted in Cailin Village, Changde City, Hunan Province, China, a small grass-roots natural village with a long history, favorable climatic conditions, and natural resources. The resident population of Cailin Village is 1,950, with a small number of young people, mostly older adults and children, accounting for more than 90% of the population. Most young and middle-aged people go out to work, leaving the older adults and children in the village behind.

Research Methodology

1. Literature: Collecting literature and documents about the Hunan region, left-behind children, rural education, and related topics to obtain background information and existing research results

2. Interviews: To understand left-behind children's requirements and challenges for developing activity spaces through interviews.

3. Questionnaires: To understand the real needs of left-behind children and related people in rural areas for activity spaces.

Source of Data

The researcher traveled to Cailin Village in Hunan Province to conduct a questionnaire survey of local left-behind children. Face-to-face exchanges and interviews were conducted with left-behind children and residents to obtain information about left-behind children's daily life routines, types of activities, activity preferences, and activity needs.

Population and Sampling

Samples were taken from children and child guardians in Cailin village. The questionnaire survey was conducted to select a sample of 100 children aged 6–13 in the village; most of these 100 children are left-behind children and are the primary users of the activity center. Out of the 100 children in the questionnaire survey, 20 children and their guardians were selected to be interviewed by the researcher.

Data Collecting

1. Questionnaire: The researcher surveyed 100 village children and collected the data from the questionnaire.

2. Interview: The researcher used a semi-structured interview as a data collection tool. After the questionnaire survey was completed, 20 children of different ages were selected as typical objects in the sample and interviewed regarding their feelings, deficiencies, and needs for the existing activity space environment to more comprehensively analyze the needs of the sample population for activity centers. At the same time, the guardians of these 20 children were interviewed to obtain the content and regularity characteristics of children's activities from the perspective of child caregivers.

Analysis of Data

In this study, the researcher compares the data after the questionnaires and interviews are completed and double-checks them to ensure the accuracy of the data. The questionnaire is divided into four parts: essential information, activities, satisfaction with the current situation, and demand for activity space. The left-behind children filled out the questionnaire on the spot, and the questionnaire data was collected.

The first part is the basic information, as seen in Table 1. Regarding gender distribution, the sample has a balanced proportion of men and women. Regarding age, "10–11 years old" has the highest proportion at 33%. Regarding life care, "living with grandparents" has the highest proportion at 76%.

Table 1 Basic information of the research sample

Question	Option	Number of selections	Percentage (%)	Cumulative percentage of (%)
Gender	Boys	52	52	52
	Girls	48	48	100
Age	6-7Years old	18	18	18
	8-9Years old	28	28	46
	10-11Years old	33	33	79
	12-13Years old	21	21	100
Who do you live with at home?	Father	5	5	5
	Mother	17	17	22
	Grandparents	76	76	98
	Relatives	2	2	100
Summation	100	100.0	100.0	

The second part is the activity situation. The information obtained from the questionnaire research is that most children like to go out to play activities, the frequency is once or more times a day, and most of the playing time on the weekdays is concentrated in the afternoon after school. However, due to the need for more children's activity space in the countryside, they can only play in the school or near their homes. They play with friends, watch TV, or do sports on weekends.

The third section was a survey of satisfaction with the current situation, which showed that the children felt that most of the activity spaces were average and could be improved (Table 2).

Table 2 Satisfaction survey of the current situation

Question	Very dissatisfied	Discontent	Commonly	Satisfaction	Very satisfied
Rural overall activity space	3	16	58	19	4
outdoor activity space	5	10	48	33	4
campus space environment	2	3	52	34	9
home space environment	4	11	46	33	6

The fourth part is a survey on the need for activity space. Since there is no fixed space for children's activities in the villages, most children prefer to play in the school. From the results, most children think there should be play facilities in the activity space, which functionally should fulfill both recreation and education (Table 3).

Table 3 Survey of demand for event space

Question 1.What is your favorite location for an event space?	Option	Natural Space	Village Streets	School	home
	quantities	17	5	65	21
Question 2. What amenities would you like to see in a children's activity space?	Option	Game Facilities	Fitness Facilities	Sculptures	Recreational Facilities
	quantities	47	34	6	13
Question 3. What function do you think the event space should fulfill?	Option	Entertainment	Socialization	Education	Emotional
	quantities	12	46	27	15

After the questionnaire research, the researcher conducted semi-structured interviews with the guardians of 20 children. Among the parents interviewed, most of the left-behind children in rural areas are cared for by their grandparents, who cannot educate, do not know the scientific methods of caring for children, and some even tend to spoil their children.

The researcher needs to dominate the direction of communication in the interviews. The content of the interviews is random but will be centered on the following aspects: information about the needs and background of the left-behind children, difficulties faced by the left-behind children in the countryside, and existing problems in the activity venues of the children in the countryside.

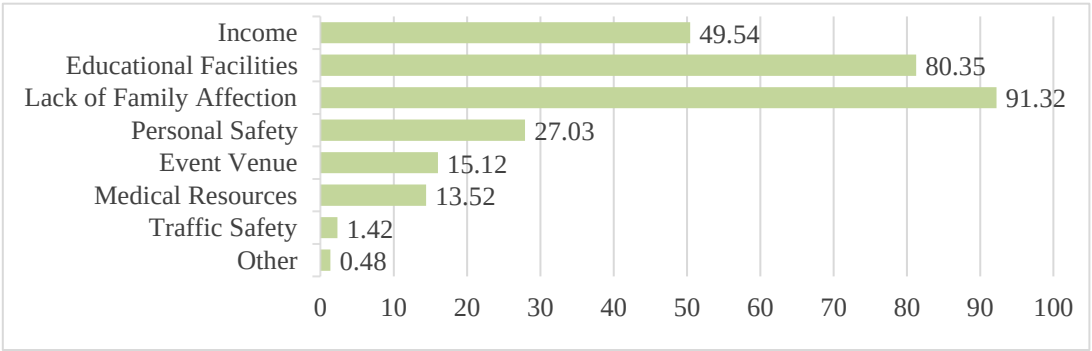

Figure 1 Difficulties faced by left-behind children in villages
Source: Self-drawn by the author, 2023

The following practical information was summarized through the interviews with the guardians. According to the analysis of the current situation, the most significant difficulty left-behind children face in the countryside is the lack of family love, accounting for 91.32%, followed by the backwardness of educational facilities, accounting for 80.35%. These two problems are also the most significant problems for the left-behind children in the countryside (Figure 1). Among the existing problems of children's playgrounds in the countryside, 70.92% think that there is a lack of dedicated outdoor playgrounds for children, and 77.5% think that there is a lack of rich and exciting playgrounds (Figure 2), which are the two most prominent problems.

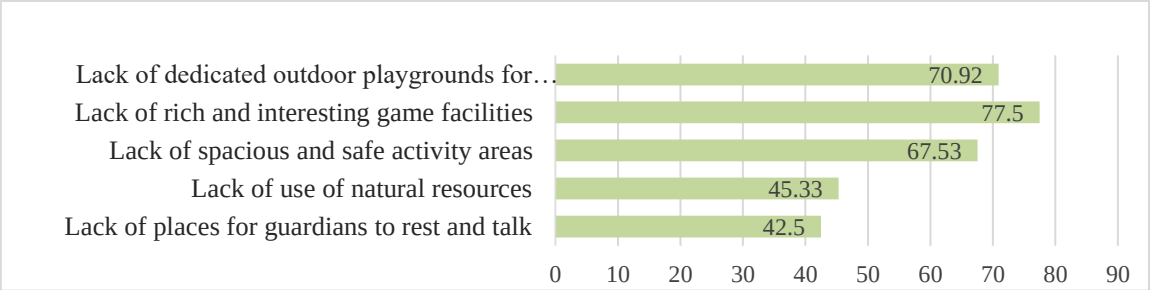

Figure 2 Existing Problems with children's venue
Source: Self-drawn by the author, 2023

Research Results

1.User Needs Analysis

Objective 1. The results showed that according to the appeal questionnaires and interviews, the proportion of options of concern and the summary of interview questions can show that the conclusions of the two research methods are the same. The researcher summarizes the needs of the left-behind children into four aspects, which should be embodied in the design of the activity center. These four needs are recreational, social, educational, and emotional (Figure 3).

Figure 3 The needs of rural left-behind children for activity space
Source: Self-drawn by the author, 2023

1.1 Entertainment needs: Providing an entertainment place where they can relax can enable left-behind children to relax, soothe themselves, interact with friends, and enhance their well-being after school.

1.2 Social needs: In the design of the activity center, more space for interaction should be designed to allow them to integrate into normal interpersonal relationships and meet their average social needs.

1.3 Educational needs: with functional space to provide learning, introduce extracurricular learning interests, and extend the knowledge inside and outside the classroom for left-behind children.

1.4 Emotional needs: interrelated with the needs of the first 3 points and rising to the spiritual level, from the perspective of children's emotional deficiency, so that left-behind children can be emotionally compensated in the activity space.

2. Design strategy

Objective 2. The results showed that, in the design of the activity center, it is necessary to focus on the needs and opinions of the children. Based on the needs of the left-behind children, the researcher came up with the corresponding design principles and finally summarized the design strategies through the design principles.

2.1 Design Principles

Table 4 Comparison table of design principles

Design principles	Content Overview
Child-centered	The design should be child-centered, in line with children's needs and psychological characteristics.
Regional cultural integration	The design should respect and reflect the cultural characteristics of the Hunan region and the rural landscape.
Innovativeness	The design should be innovative and forward-looking, reflecting novel design concepts and technical means.
Practicality	The design should be practical and operable to meet practical use needs.
Sustainability	The design should take into account ecological protection and sustainable development factors.

2.2 Design strategy

2.2.1 Spatial design for emotional communication

The lack of affection makes the left-behind children in rural areas sensitive and introverted, which may lead to their low self-esteem and self-isolation, and they are more eager to communicate with others to make up for the lack of affection by acquiring more emotions. People around the left-behind children, such as grandparents, relatives, teachers, and classmates, should look at them as equals and give them more attention and care. In the design of activity spaces for left-behind children, more interaction spaces should be designed, such as sports spaces, reading spaces, and learning spaces, to meet the needs of rural left-behind children for socialization through multiple interaction spaces. At the same time, Internet technology can meet the needs of left-behind children for parent-child interaction with their parents working outside the country, strengthen the emotional bond, and make up for the lack of affection of left-behind children. In addition to providing diversified emotional space, a safe and private space should be established for specialized mental health education to understand the psychological problems of local left-behind children and provide them with timely treatment.

2.2.2 Functional Complex Activity Space Design

For left-behind children, due to the various problems caused by changes in family structure, the activity space is not only a place for socializing and playing but also a place to make up for the missing aspects of their lives. Compared with the activity space for non-left-behind children, it needs to be more functional. When designing the activity space for rural

left-behind children, it is necessary to consider various aspects and angles of design.

At present, compulsory education in China has been popularized, and there is a complete primary education curriculum in rural areas, but there needs to be an extended curriculum. Both the extension of classroom knowledge and the cultivation of hobbies cannot meet the needs of left-behind children. In the activity space for left-behind children, the existing activity space provides a platform for more knowledge intake through functional composite design to broaden the knowledge of left-behind children and shorten the education gap between the countryside and the city.

2.2.3 Educational space design for humanities heritage

China is a vast country, and the countryside is the best museum of humanities and history. Because rural areas are far from urban development, traditional folklore and history have been effectively preserved. The left-behind children in the villages are the leading group of local humanistic history inheritance. In the design of educational space, local historical and cultural elements should be extracted and applied to the design so that the educational space can be used as a carrier for the continuation of humanities, which is not only a place for knowledge transfer but also a place for humanities inheritance so that the students can receive cultural inculcation and inheritance of humanistic spirit in the educational space with rich cultural inner ring. At the same time, the humanities and history education teacher also allows students to perceive the humanities and history in a vivid image.

2.2.4 Entertainment space design close to nature

With the continuous development of society, the opportunity for children to integrate into nature is now less and less, so in the overall design of outdoor activity spaces for left-behind children in rural areas, the integration of space and nature is undoubtedly the most important. The most significant advantage of rural areas is the advantage of natural resources. Integrating space and nature is the most important; rational planning and use of natural resources in rural areas is conducive to the sustainable development of the rural ecological environment and enables left-behind children to get closer to and know nature and promote their physical and mental healthy development.

Children's outdoor activity space in rural areas differs from that in cities, where high-rise buildings, high building density, and few natural environments exist. It is difficult for children in cities to have opportunities to contact nature in their daily lives. In contrast, rural areas, on the contrary, are characterized by mountains, forests, rivers, fields, and other natural landscapes, and have good natural conditions and agricultural landscapes, and the combination of children's activity venues and the advantages of rural environments can effectively and scientifically Combining children's activity venues with the environmental advantages of the countryside can effectively and scientifically increase children's opportunities to get close to nature.

3. Design practice

Objective 3. The results showed that, according to the design strategy to guide the practice, the design steps of the activity center for rural left-behind children are as follows (Table 1).

3.1 Design flow chart

The following are the design steps for the activity center for left-behind children in rural areas (Figure 4).

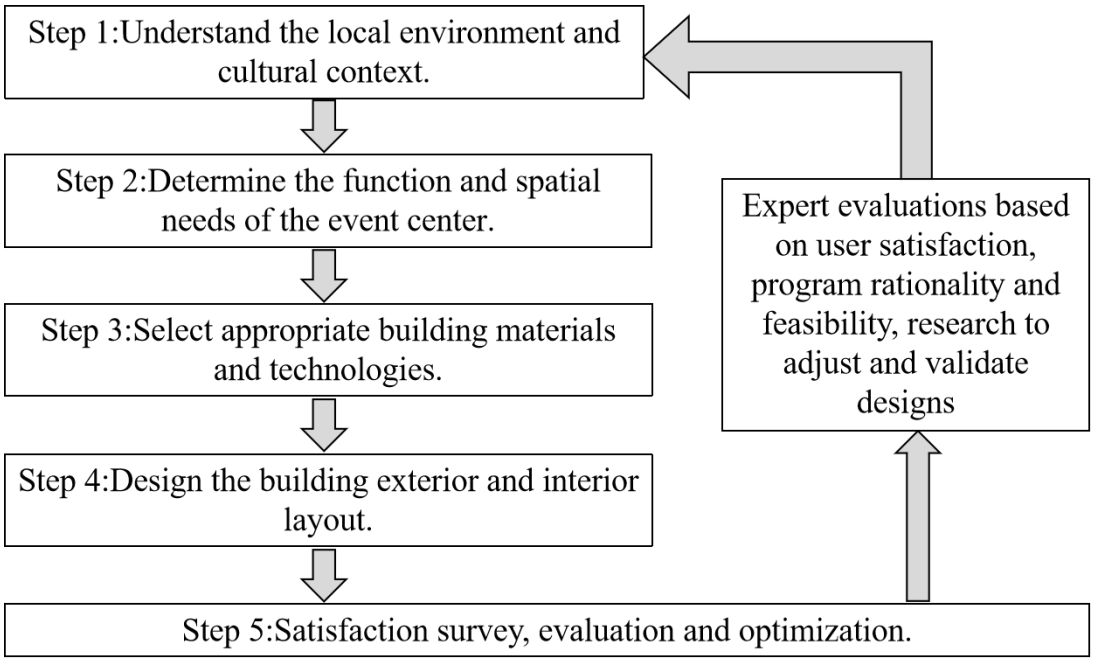

Figure 4 Design flow chart
Source: Author, 2023

Step 1: Understand the local environment and cultural background. Before designing, it is necessary to deeply understand the local environment and cultural background, including geography, climate, and folk culture.

Step 2: Determine the function and space requirements of the activity center. The functional requirements of the activity center are the focus of the design, which needs to meet the activity needs of left-behind children while considering safety and education.

Step 3: Choose suitable building materials and techniques. To ensure the safety and comfort of an event center, appropriate construction materials, and technologies must be selected; local climate and environmental factors must be considered.

Step 4: Design the exterior and interior layout of the building. Based on the function and space requirements of the activity center, the designer needs to design the exterior and interior layout of the building to ensure that the activities of left-behind children can be effectively organized and managed.

Step 5: Satisfaction Survey, Evaluation, and Optimization.

3.2 Site Selection

The selected design site is in the northeast direction of Cailing Village .The total area of the design scope is about 2400 m2, and the building covers 872 m2. The site's overall topography is relatively flat; the terrain decreases gradually from the northwest and southeast to the middle; there is no significant height difference, the surrounding building layout is relatively gathered, and the building form varies mainly between brick and tile buildings. At the same time, there are a small number of earthen buildings.

3.3 Space Planning and Functional Zoning

The activity center is mainly for entertainment, socialization, education, and emotional enhancement. It is an open activity center for children left behind in rural areas, with the concept of "nature education" embedded.

The purpose of this design is to introduce children to the natural space to create a spacious environment for children in Cailing Village to play, socialize, and learn, and also to meet the needs of guardians to rest, as well as meet the needs of multi-age people's activities, which can not only achieve the effects of education and fun but also play a good role in children's physical and mental health.

Figure 5 General plan
Source: Design by author, 2023

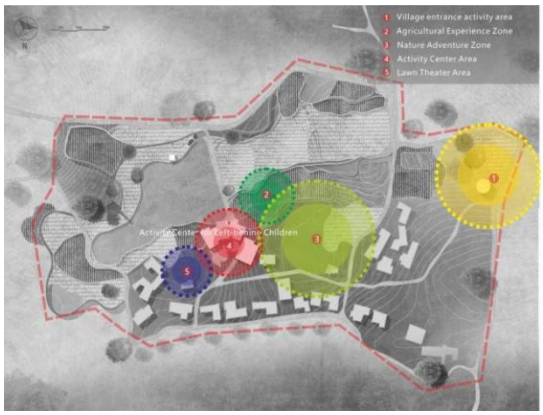

Figure 6 Functional zoning map
Source: Design by author, 2023

The general planning design is shown in Figure 5. The location of the activity center for left-behind children is in area 4, and the remaining areas are: 1 is the village entrance, 2 is the tower, 3 is the village committee, and 5 is the elementary school of the village.

The functional zoning of the activity center forms a structure of "one core + five zones" (Figure 6).

One core: The activity center for left-behind children is located at the center of the activity space for children in the village, meeting the needs of entertainment, socialization, education, and emotion and giving other functions to the site around the core.

Five zones: The researcher included the area around the activity center in the natural educational activities for left-behind children, bounded by the red line in Figure 1. The five zones are the village entrance activity zone, nature education zone, agricultural experience zone, activity center zone, and lawn theater zone.

3.4 Architectural Design

The site's original buildings are located on the east and west sides, respectively. The east side is an abandoned private house, and the west is the original activity house for left-behind children, whose structure and functions are relatively simple, with only a psychological counseling room, library, and activity room. It is closed most of the time, only used by volunteers for voluntary counseling and teaching, and occasionally opened for children who borrow books.

The building generation of the activity center for left-behind children is shown in Figure 7, which is divided into nine steps as follows:

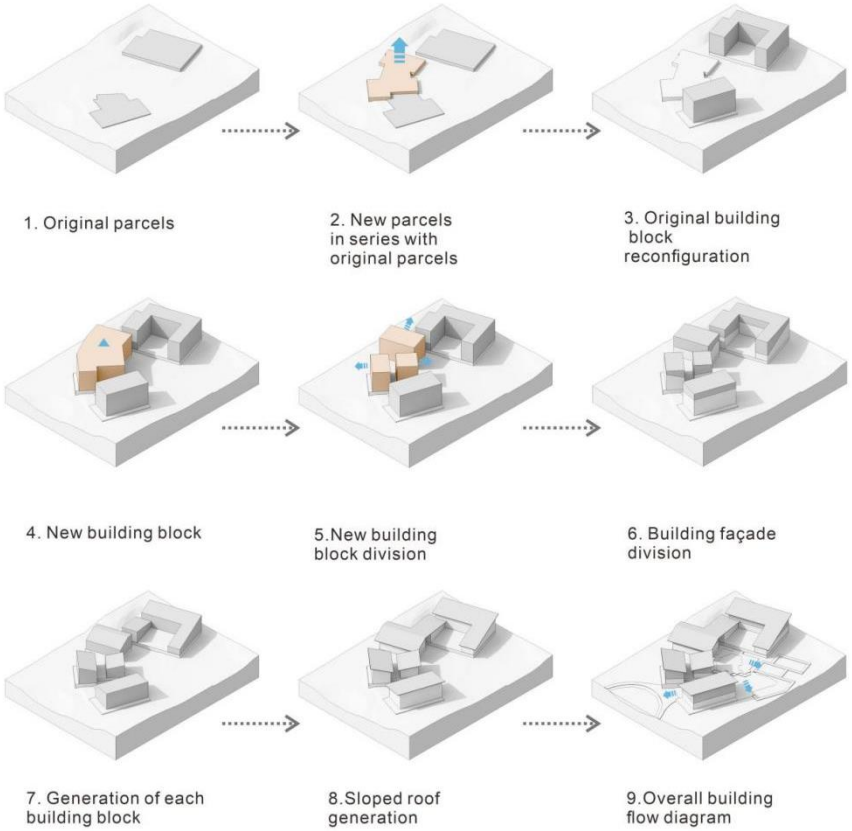

Figure 7 Architectural development process diagram
Source: Design by author, 2023

The architectural design is done through remodeling, connecting, and adding new buildings. The two buildings in the original plot are connected to the original plot through the new plot, and a new building is added in the center, connecting the two buildings to form a courtyard, mainly a space for play, interaction, and education. The original abandoned house is transformed into a shared children's public activity area and a living area for the children left behind. Two new buildings were added in the center, one for science activities and the other for multi-functional and office areas. A corridor connects the four building blocks to form a unified building block.

The form of the building is formed to stagger the existing local ancient villages through the changes in the layers of the four blocks. Considering that the building as a public service facility should be simple and modest, there is no overly exaggerated architectural volume and shape expression (Figure 8). Building materials and craftsmanship: Considering the climate and environment of Hunan, the primary materials of the building are local wood and red bricks. The roof is designed as a sloping roof according to the height difference and the convenience of drainage.

Figure 8 Building exterior rendering
Source: Design by author, 2023

3.5 Environmental Design

There is a sandpit, a secret base, a swing, a seesaw, a wooden pier, and other facilities for children to play there (Figure 9).

In the design, the leisure and social needs of left-behind children and guardians (such as single parents or the elderly) are also considered. The games, leisure, and social functions are combined on the limited site, with pavilions and seats for rest and companionship. Some colorful and interesting devices are set up to serve as decoration and a place for rest and communication. Adequate socialization can promote communication and interaction between children, villagers, and their partners, neighbors, and relatives, thus promoting the healthy psychological development of left-behind children.

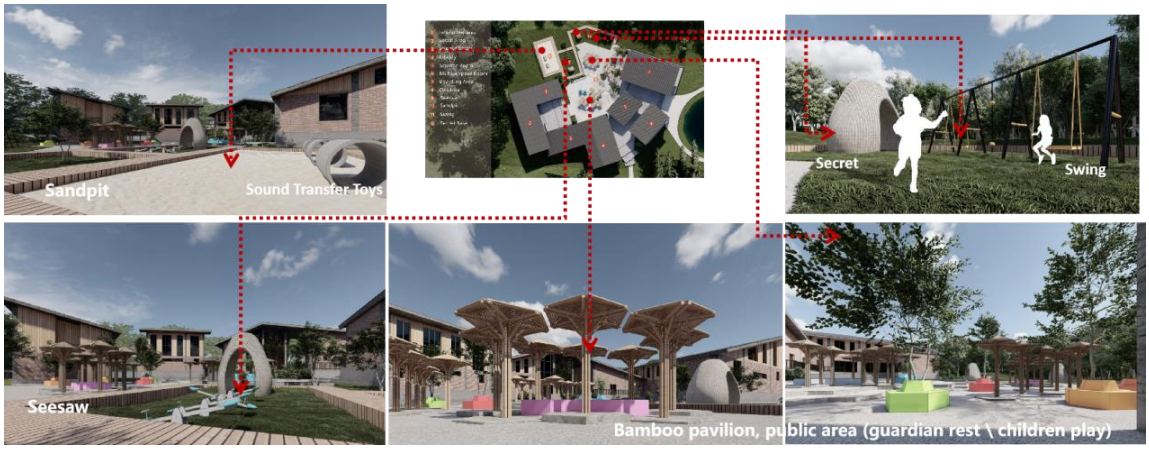

Figure 9 Outdoor environment design effect
Source: Design by author, 2023

3.6 Interior design

3.6.1 Indoor functional division.

The interior space consists of four buildings, and all four blocks have passages connected to the outdoors using light and ventilation (Figure 10).

Figure 10 Interior floor plan
Source: Design by author, 2023

From left to right, the first building is the moving area, with a large area of regional connectivity and a large space area at the entrance. Indoor space functions are the parent-child interaction area, parent-child communication area, psychological consultation room, social area, science room, storage area, and toilet. As a regional space for children's interests, it meets the different needs of children. Among them, the parent-child communication area and the psychological counseling room meet the function of relieving the psychological problems of left-behind children.

The second building is in a quiet area, and the indoor space functions as a library, study room, book storage room, and toilet.

The third building is a mixed space, and the functions of the indoor space are a multi-functional room, a comprehensive office, an office, and a monitoring room. The office and activity spaces are connected by connecting corridors.

The fourth building is a quiet area, and the indoor space functions as a dormitory, communication, and storage area.

3.6.2 Social area space

The social area space (Figure 11) mainly meets the social needs of left-behind children, and children can play group games in this space, and its activities take the form of games with therapeutic effects, such as role-playing, drama performances, and watching movies, etc., so as to satisfy children's spatial and activity needs, cultivate social behaviors, and enable left-behind children to gradually rehabilitate themselves psychologically and behaviorally so as to overcome their psychological barriers.

Figure 11 Social area space
Source: Design by author, 2023

3.6.3 Parent-child communication area

The parent-child communication area (Figure 12) is a more independent space, communicating with parents in distant cities through network connections, so that left-behind children and their parents can communicate face-to-face through the network, assuming the function of emotional needs.

Figure 12 Parent-child communication area
Source: Design by author, 2023

3.6.4 Library design

The library design adopts a semi-open enclosed space form, with glass, bookshelves surrounded by semi-isolated space, to a certain extent, can isolate the outside world's interference, so that children can focus on reading and learning, at the same time, in a non-disturbance of the space is also both to maintain the children's psychological sense of security (Figure 13).

Figure 13 Library design drawings
Source: Design by author, 2023

Discussion

This paper focuses on four questions: 1) the necessity of building activity centers for left-behind children; and 2) the role of integrating regional cultures. 3) the balance between educational and recreational needs; and 4) The social impact of activity centers.

Key findings and discussion

1. The necessity of building an activity center for left-behind children: In the discussion, we first emphasized the necessity of this activity center. Many left-behind children in Cailin Village, Hunan Province, face challenges in education, socialization, and emotional needs. Therefore, establishing a specialized activity center to provide relevant support and services is crucial to improving their quality of life.

2. Integration of regional culture: During the discussion, we emphasized the importance of integrating regional culture in the design of activity centers. Cailin Village in Hunan has a rich regional culture, and these cultural elements not only enrich the activity center's design but also help improve the sense of identity of the left-behind children in the center. The integration of regional culture can promote interaction between children and the center and make them more receptive to relevant educational and recreational activities.

3. Balance between educational and recreational needs: In the design of the activity center, we emphasized the balance between educational and recreational needs. We recognize that left-behind children need a good education and opportunities for recreation and socialization. Therefore, the discussion emphasized the need to balance these two aspects in the design to meet the overall needs of the left-behind children.

4. Social Impact of the Activity Center: In the discussion, we mentioned the social impact of the activity center. This design solution is about the left-behind children in Cailin Village and the entire village. The construction and operation of the activity center will have a positive social impact, including improving the quality of life of the children, reducing social problems, and improving social cohesion.

Limitations of the research

The main limitation of this study is its geographical restriction. The design was conducted for Cailin Village in Hunan Province and may not apply to activity centers for left-behind children in other regions. Different regions have different cultural, social, and economic conditions that may require different design approaches. Also, this study's source and sample of data are relatively limited to this village only. Broader data collection may contribute to a more comprehensive understanding of left-behind children's needs and social

context. Future research may consider expanding data collection sources and sample sizes. These research limitations need to be overcome in subsequent studies.

Conclusions

Firstly, the research results show that the critical elements of the design of the activity center for left-behind children include user needs, educational conditions, the natural environment, the humanistic environment, and social support.

Secondly, according to the status and functional needs of the original building, the design strategy of the left-behind children's activity center can be divided into the emotional communication space, the functional composite space, the educational space of humanistic inheritance, and the recreational space close to nature.

Thirdly, through the design of left-behind children's activity centers, abandoned buildings and sites in ordinary natural villages are selected and transformed into left-behind children's activity centers by methods including optimization of the plan layout of the building, transformation of the space, lighting, and ventilation, children's recreational facilities, and designing in combination with local culture.

Recommendation

1. Expanding the sample size of the study: Due to the limited sample size of this study, the results may be affected by factors such as geography and culture, and there may be some differences in applicability to left-behind children in other regions. Future research can expand the sample size to cover different regions and cultural backgrounds.

2. Innovative forms and methods of activities: To better meet the needs of left-behind children, research on innovative forms and methods of activities can be increased for future studies. New activities, such as interactive games and experiential learning, can be introduced so left-behind children can learn in play and grow in experience.

3. To ensure the activity centers' sustainability, the local government and villages should support the final design. In addition, effective operation and management must be established in the villages to ensure that the activity centers provide long-term support for the left-behind children. Future research can focus on the actual operational effects of the activity centers and continuously improve and optimize the design solutions to better meet the needs of left-behind children.

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References

Dong, D., Shu, F., & Gang, L. (2018). Discussion on landscape design of rural left-behind children's outdoor activity space under the background of rural landscape——Taking Liujiafan Village, Feidong County, Anhui Province as an example. *Journal of Henan University of Science and Technology*: *Natural Science Edition*, 46(2), 9-17.

Fan, F., Su, L., Gill, M. K., & Birmaher, B. (2010). Emotional and behavioral problems of Chinese left-behind children: a preliminary study. *Social psychiatry and psychiatric epidemiology*, 45, 655-664.

Feifan, J. (2017). A study of "locality" in modern architectural design in the countryside [bachelor's degree, Henan University].

Hu, H., Lu, S., & Huang, C.-C. (2014). The psychological and behavioral outcomes of migrant and left-behind children in China. *Children and Youth Services Review*, 46, 1-10.

Jiali, L. (2018). Analysis and space construction of left-behind children's outdoor activities based on natural experience. *art education*(10), 99-100.

Jian, S., & Wei, Z. (2022). Design research on interactive children's furniture in left-behind children's activity center. *Packaging Engineering*, 43(S1), 128-132.

Jianyong, H., & Xiaopeng, B. (2019). A Study of the Spatial Attributes of Outdoor Activities for Rural Children. *Architecture and Culture*, 10.

Jingjing, L. (2016). Research on the design of family-friendly products for left-behind children. *Art Education Research*(5), 91-91.

Jiyu, X. (2015). Research on the Design of Rural Left-behind Children's Activity Center Southwest Jiaotong University].

Keke, L. (2019). Research on Campus Space Design of Rural Primary Schools Coexisting with the Community Harbin Institute of Technology].

Luofeng, Q., & Jiayin, Y. (2018). Analysis on the Design Strategy of Public Activity Space in Primary School Campus Based on Children's Psychological Development Needs. *Architecture and Culture*(4), 190-192.

Shuo, L. (2019). Research on children's public activity space environment design based on experience. *Chinese writers and artists*.

Wangwang, D. (2021). Research on planning and design of rural children's activity space in central Anhui Province Anhui Jianzhu University].

Xiaojing, Z. (2018). Research on the space environment design of left-behind children in rural areas during the transition period Hunan Normal University].

Xin, L., Kaiyun, Z., & Peifeng, Z. (2022). Research on Design Strategy of Outdoor Activity Space in Child-friendly Community. *Residential Technology*, 42(04), 15-18.

Yong, H., Weidan, L., & Zheng, C. (2015). Reflections on residential area planning and design under the change of family network structure in southwestern rural areas. *Modern Urban Studies*(04), 35-40.

Zhiqiang, G., Ying, C. C., & Meixiang, L. (2013). Care and Service System Construction for Rural Left-behind Children: *An Empirical Study in Hunan Province*. Hunan ke xue ji shu chu ban she.