# The Demand-Supply Measurement of Youth Development-Oriented Cities Based on the Characteristics of Generation Z: A Case Study of Shanghai, Nanjing, and Hangzhou

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**Abstract**
This study examines Generation Z's (born 1997-2012) demand patterns and urban development alignment in Shanghai, Hangzhou, and Nanjing. As key drivers of urban innovation and economic growth, Gen Z exhibits atomized lifestyles and self-actualization tendencies. A demand-supply evaluation framework is developed across three tiers: basic growth, relational cohesion, and developmental leap. Empirical analysis reveals supply-demand mismatches: Shanghai and Hangzhou excel in employment ecosystems and recreational infrastructure, while Nanjing achieves higher youth satisfaction despite weaker supply capacities. Findings highlight Shanghai's lag in leisure services, Hangzhou's deficiency in cultural amenities, and Nanjing's need for entrepreneurship support. The study advocates policy optimization to bridge gaps in youth-oriented urban development, emphasizing tailored strategies to enhance productivity and social integration for this generation.

**Keywords:** Youth Development-Oriented Cities,Demand-supply matching,Generation Z,development evaluation

## Introduction

As China's demographic dividend begins to wane, major cities across the country are increasingly recognizing the vital role that young people play in driving high-quality development across economic, social, and urban domains. In response, national and local governments have introduced a range of youth-oriented policy initiatives—ranging from improving talent attraction mechanisms to enhancing urban appeal for young residents. In April 2017, China released its first national-level plan dedicated to youth development: the Medium and Long-Term Youth Development Plan (2016–2025) (hereafter referred to as the Youth Development Plan), which provided clear guidance on education, employment, and entrepreneurship for young people (China, 2017). Later, in April 2022, the National Development and Reform Commission, along with 16 other ministries, jointly issued the Opinions on the Pilot Construction of Youth Development-Oriented Cities, advocating for the creation of cities that meet young people's needs in housing, employment, health, and education (NDRC et al., 2022).

Amid the growing trend of youth migration to urban areas, cities in economically advanced regions such as the Pearl River Delta and the Yangtze River Delta have seen increasingly concentrated youth populations. First-tier cities like Beijing, Shanghai, and Guangzhou, along with emerging cities such as Hangzhou, Nanjing, and Chengdu, have become the primary destinations for young people, offering abundant employment opportunities, high-quality healthcare and education services, and appealing living environments (Dou et al., 2023). In line with national strategies to build youth-friendly cities, many regions have prioritized creating high-quality spaces for youth production, living, and ecological wellbeing. Cities such as Shanghai, Hangzhou, and Nanjing have actively undertaken various youth development-oriented city-building initiatives.

However, despite the richness of these policy practices, a corresponding theoretical framework for youth-friendly urban spatial development remains underdeveloped in the academic realm. At the macro level, some scholars have proposed evaluative frameworks for youth development-oriented cities. For instance, Zheng et al. (2022) developed a four-dimensional assessment model—"livability, employment, vibrancy, and potential"—based on the characteristics of Generation Z. Xu et al. (2020) utilized multi-source big data to build digital profiles of youth groups, supporting evaluation efforts with empirical tools. Liu et al. (2021) constructed an assessment framework for youth-friendly cities using Zhuhai as a case study and offered policy suggestions accordingly. Other studies have focused on policy evaluations, assessing the effectiveness of housing support, spatial inclusivity, employment protection, and administrative services in pilot cities (Zhu, 2018; Wu and Zhou, 2023), or using methods such as fuzzy-set Qualitative Comparative Analysis (fsQCA) and the PMC index model to evaluate talent policy (Li and Zhang, 2023).

Scholars have also examined spatial needs, identifying the typologies and characteristics of youth-friendly spaces (Li, 2023), and proposing spatial configurations based on youth demand (Wang et al., 2023; Yin et al., 2021). Internationally, research has mainly focused on the relationship between cities and youth employment, often incorporating negative externalities brought by rapid urbanization (Zhu et al., 2019). In countries such as the United States, Canada, Poland, and Germany, cities have developed youth-friendly public policies and urban strategies centering on employment and community life. For example, the American Institute for Economic Research (2016) released a ranking of the best U.S. college destinations, evaluating cities' appeal to youth through demographic features, quality of life, and economic development. Similarly, Youthful Cities, a Canadian strategy consulting firm, identified key characteristics of youth cities—connectivity, dynamism, growth, novelty, and creativity—and developed an urban youth index accordingly (Youthful Cities, 2023). Some scholars have also addressed youth vulnerability, highlighting socio-economic and spatial inequalities faced by marginalized urban youth (Sriskandarajah, 2021).

In sum, current academic research either focuses on the interaction between youth populations and urban development—exploring evaluation systems and development pathways—or investigates spatial configuration through an analysis of youth behavior and needs. Yet, within the discipline of urban planning, such studies remain exploratory. There is a lack of attention to the dynamic coupling between evolving youth needs and urban spatial responses. Quantifying the multidimensional development needs of Generation Z youth and constructing a precise "demand-supply" matching mechanism has become a critical breakthrough for implementing national strategies and invigorating urban youth. This calls for deeper theoretical inquiry to support the development of urban spaces conducive to youth innovation and entrepreneurship.

## 1. Research Foundation for Youth Development-Oriented Cities

### *1.1. Homo-Urbanicus Theory*

The Homo-Urbanicus Theory is a human-centered planning framework proposed by Liang Heren, which emphasizes that urban residents make rational choices regarding their settlement locations to balance their material needs with spatial interaction needs. Liang (2012; 2019) defines Homo Urbanicus as a composite identity, wherein an individual may simultaneously possess multiple urban roles. In the context of this study, the Homo Urbanicus identity of youth in industrial communities is shaped by life stage, age, gender, occupation, job position, and family roles.

Building upon the humanistic logic of "self-sufficiency and co-existence balance" embedded in the Homo-Urbanicus Theory, domestic scholars have begun to construct planning evaluation methodologies that reflect Chinese characteristics. For example, Wei Wei of Wuhan University has attempted to develop an assessment framework for urban public service facilities based on this theory. He positions public facilities as carriers of spatial interaction opportunities and argues that their spatial distribution should strive to fulfill both individual and collective needs—emphasizing full coverage, equalization, and equitable access to opportunities within regions. This forms the basis for a planning evaluation model from the perspective of Homo Urbanicus (Wei et al., 2018; 2020; 2022).

### *1.2 Constructing a Demand–Supply Evaluation Framework*

According to the Homo-Urbanicus Theory, planners aim to achieve an optimal match between "typical urban residents" and "typical habitats" by analyzing both ends of the urban experience. The attributes of "typical urban residents" are defined by demographic characteristics (such as age and gender) as well as contextual elements like life stage, socio-economic status, and cultural background. Meanwhile, typical habitats refer to urban spatial units that provide opportunities for spatial contact.

In this study, youth residing in industrial communities are identified as the demand side—"typical urban residents" in search of spatial interaction—while the industrial community, as an integrated unit of production and living, serves as the supply side, i.e., the "typical habitat." Based on this logic, the study proposes an evaluation pathway for industrial communities by assessing the demand characteristics of Homo Urbanicus and the spatial supply capacity of the habitat. The aim is to enable optimal matching between human needs and spatial opportunities, thereby fostering youth development (Fig 1).

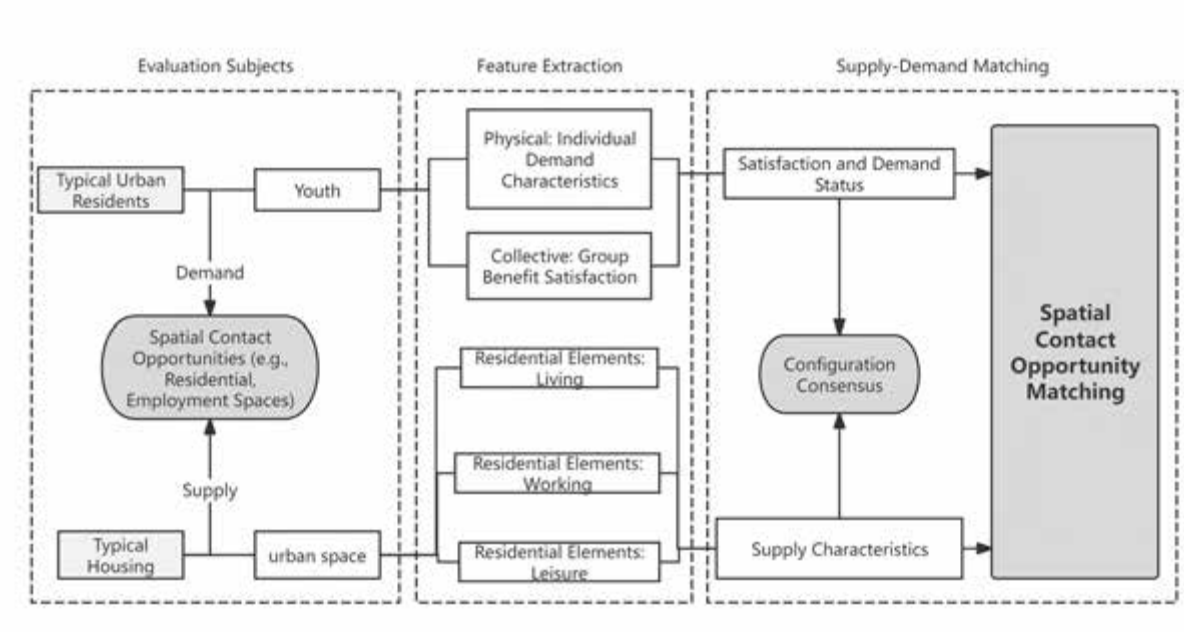


**Fig 1** Construction of evaluation pathways for youth development-oriented cities

## 2.Construction of the Demand–Supply Evaluation Indicator System for Youth-Oriented Cities

Establishing an evaluation system for youth-oriented cities provides a scientific tool to promote their construction and sustainable development. The assessment of youth-oriented cities must adhere to a human-centered approach, using quantitative methods to measure the comprehensive effectiveness of science and technology innovation (STI) industrial communities in meeting the multidimensional needs of contemporary youth, stimulating regional innovation vitality, and optimizing spatial efficiency. This study evaluates the effective demand–supply matching of spatial resource allocation in youth-oriented STI industrial communities from both demand and supply perspectives.

### *2.1 Analysis of Generation Z Youth Demand Characteristics*

Based on the 2021 China Social Status Comprehensive Survey (CSS) data, this study selects urban youth born between 1994 and 2003 who have entered the workforce. [Given that most industrial communities are located in areas with high urbanization rates, rural populations were excluded for research purposes.] The intergenerational characteristics of this cohort are analyzed to summarize youth group traits and development demand preferences, providing the "demand-side" direction for selecting evaluation indicators for youth-oriented industrial communities.

**1)** High Educational Attainment

According to the CSS data, urban youth generally possess high educational backgrounds(Fig 2), with approximately 68.2% having attained college education or above, including 34.8% with a bachelor's degree and 4.6% with a postgraduate degree. A comparison across generations reveals that, due to increased emphasis on higher education and demand for highly skilled talents, Generation Z exhibits a significant educational advantage over previous generations. This high educational attainment not only broadens employment options for Generation Z but also facilitates access to higher-paying jobs and promotion opportunities.


| | Not enrolled in primary school | Primary school | Junior high school | High school | Technical secondary school | Vocational high technical school | Junior college | Undergraduate | Graduate student |
|---|---|---|---|---|---|---|---|---|---|
| 1974-1983 | 1.18% | 8.43% | 28.99% | 11.69% | 9.47% | 1.92% | 15.53% | 19.67% | 3.11% |
| 1984-1993 | 0.16% | 2.66% | 18.91% | 10.78% | 6.09% | 2.19% | 24.53% | 28.59% | 6.09% |
| 1994-2003 | 0.00% | 0.00% | 11.48% | 8.20% | 8.85% | 3.28% | 28.85% | 34.75% | 4.59% |

**Fig 2** Statistical analysis of educational attainment across intergenerational cohorts

**2)** High Degree of Atomization
Influenced by the one-child policy and the fast-paced modern era, Generation Z youth display a marked degree of atomization. Compared with cohorts born between 1974–1983 and 1984–1993, the proportion of only children among Generation Z is higher by 26.5 and 9.7 percentage points, respectively, with a rate of 43.6%. Regarding marriage and fertility, 2021 data indicate nearly 75% of Generation Z youth are unmarried and childless, with only 11.8% having children.

**3)** Virtual and Fragmented Socialization
With rapid advances in information technology and the popularization of social media, Generation Z exhibits virtual and fragmented socialization characteristics. They prefer online platforms for information acquisition, business/work communication, and social relationship building, rather than traditional face-to-face interaction. Over 80% of Generation Z maintain diverse virtual social circles, including family groups, friend/classmate groups, workplace colleague groups, community groups, hometown groups, and interest groups. While this facilitates the formation of virtual networks, it weakens their real-life social connections. Due to fast work rhythms and life pressures, they often struggle to participate in community activities or develop deep interpersonal ties, which further intensifies atomization and fragmentation.

**4)** Coexistence of Enjoying Life and Self-Actualization
In terms of consumption, Generation Z emphasizes personalized life experiences and enjoys traveling, artistic creation, fitness, or novel consumption experiences such as immersive theater and escape rooms. They also exhibit strong self-actualization awareness, valuing not only material needs but also spiritual satisfaction and growth. They tend to seek positions and enterprises that are challenging, innovative, and development-oriented. Additionally, they focus on personal growth and learning, willingly investing time and effort in training and educational activities to enhance their overall quality and competitiveness, and enjoy engaging in culturally enriching activities such as visiting museums and art galleries.

### *2.1.1 Demand Hierarchy Characteristics of the Youth Group*

In 1943, American psychologist Abraham Maslow proposed a hierarchy of needs theory based on motivation theory, which includes five basic needs: physiological needs, safety needs, love needs, esteem needs, and self-actualization needs, as well as cognitive needs related to knowledge and understanding, totaling six main domains of needs (Maslow, 1943). The priority of these needs differs between levels; higher-level needs only emerge after the more fundamental needs are adequately satisfied. In further discussions, Maslow suggested that for dif-

ferent personality types, there are variations in the hierarchy of needs, showing different tendencies. In 1954, Maslow elaborated this theory in his work Motivation and Personality, dividing the hierarchy into seven levels (Fig 3), where aesthetic and cognitive needs represent higher levels (Maslow, 2021).

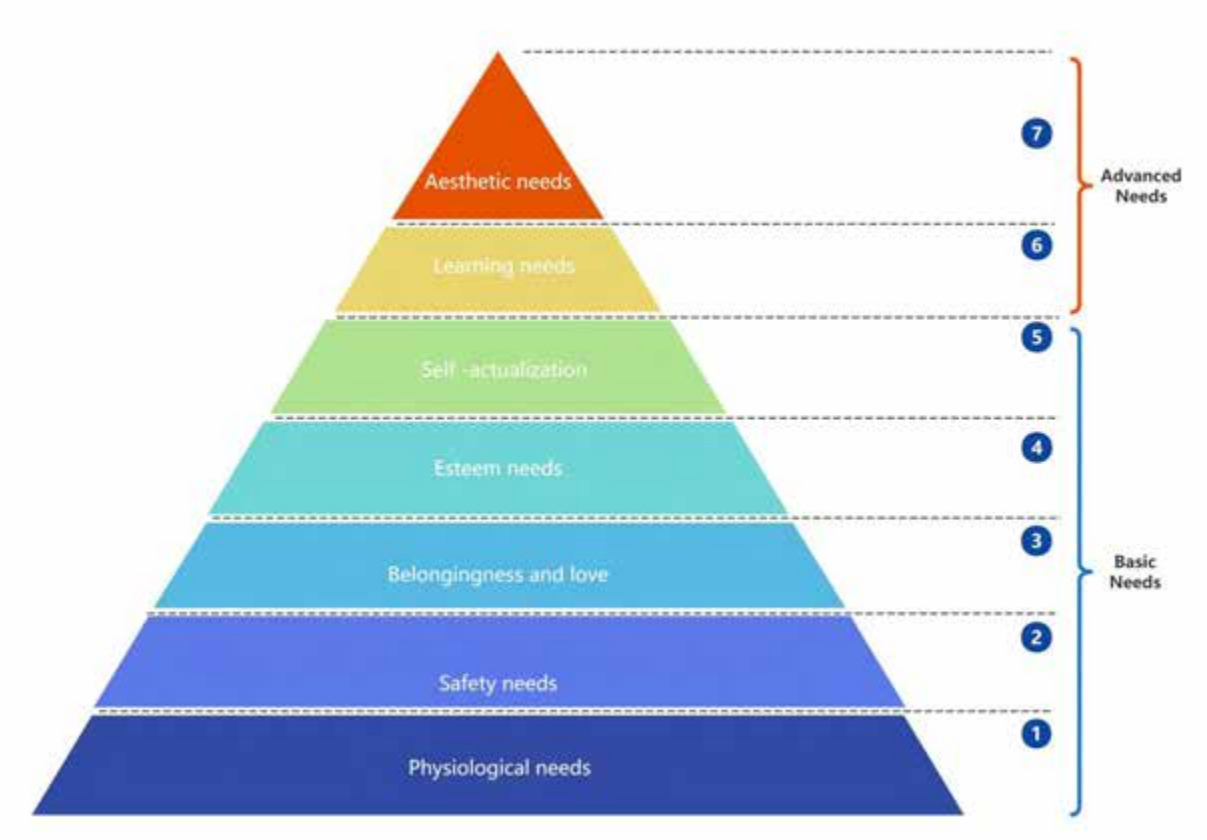


**Fig 3** Seven-stage hierarchical model of Maslow's needs theory

Following the introduction of Maslow's hierarchy of needs theory, it has been widely applied and further developed. Clayton Alderfer, a scholar at Yale University, conducted extensive empirical research and revised the traditional hierarchy, proposing the ERG theory of needs (Alderfer, 1969). In his paper An Empirical Test of a New Theory of Human Needs, Alderfer argued that Maslow's five needs did not show clear distinctions and that there was overlap between love, esteem, and self-actualization needs. Therefore, he condensed the five needs into three types: Existence needs, Relatedness needs, and Growth needs. Existence needs include material and physiological desires such as food, salary, and physical working conditions. Relatedness needs reflect the human desire for interaction with others, including positive and negative emotions. Growth needs refer to the desire to influence oneself and the surrounding environment. This categorization avoids internal overlap among different need types. The ERG theory retains the concept of need hierarchies but emphasizes that the levels are not strictly sequential and highlights the reality of individual differences in needs (Shen, 2010).

This study divides the youth group's needs into three main levels: existence needs, relatedness needs, and growth needs, with existence needs further divided into three key areas: housing, employment, and living. As shown by the treemap analysis (Fig 4), employment is the area of highest concern for youth, followed by housing and living, while attention to self-improvement is greater than to consumption and social interaction. Employment is the core focus of young people because it directly relates to their economic independence, social status, and future career prospects. Therefore, youth who have just entered society tend to prioritize local employment opportunities and work environments. Housing conditions are closely linked to quality of life; choices such as renting or purchasing, housing location, and transport accessibility directly impact life quality, making it an important concern. After satisfying basic needs, youth tend to pursue personal growth and self-improvement rather than

invest excessive energy in consumption and socializing. Limited resources lead them to prioritize activities that enhance competitiveness by balancing time, money, and effort, emphasizing long-term self-investment. Meanwhile, consumption and social activities remain important ways for youth to regulate life pace and enhance satisfaction, though they receive slightly less overall attention than self-improvement.

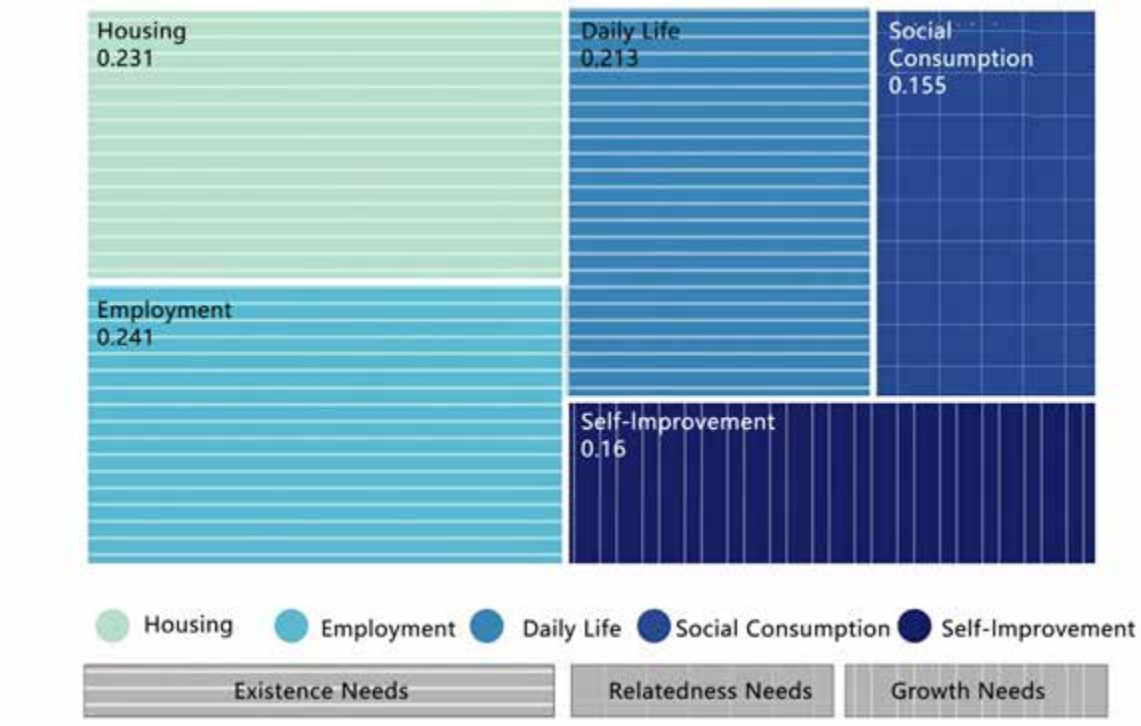


**Fig 4** Hierarchical Treemap Analysis of Youth Needs

The division of these five levels and their relative attention can be further explained by ERG theory. These levels interact dynamically: on one hand, after satisfying lower-level needs such as existence and relatedness, youth tend to pursue higher-level needs; on the other hand, unmet higher-level needs can cause individuals to focus more on lower-level needs as a compensatory mechanism, resulting in a frustration-regression effect. For self-improvement needs, increasing satisfaction does not weaken demand but rather enhances it, showing a satisfaction-enhancement effect. This also explains why youth in industrial communities pay more attention to self-improvement needs than to relatedness needs ( Fig 5).

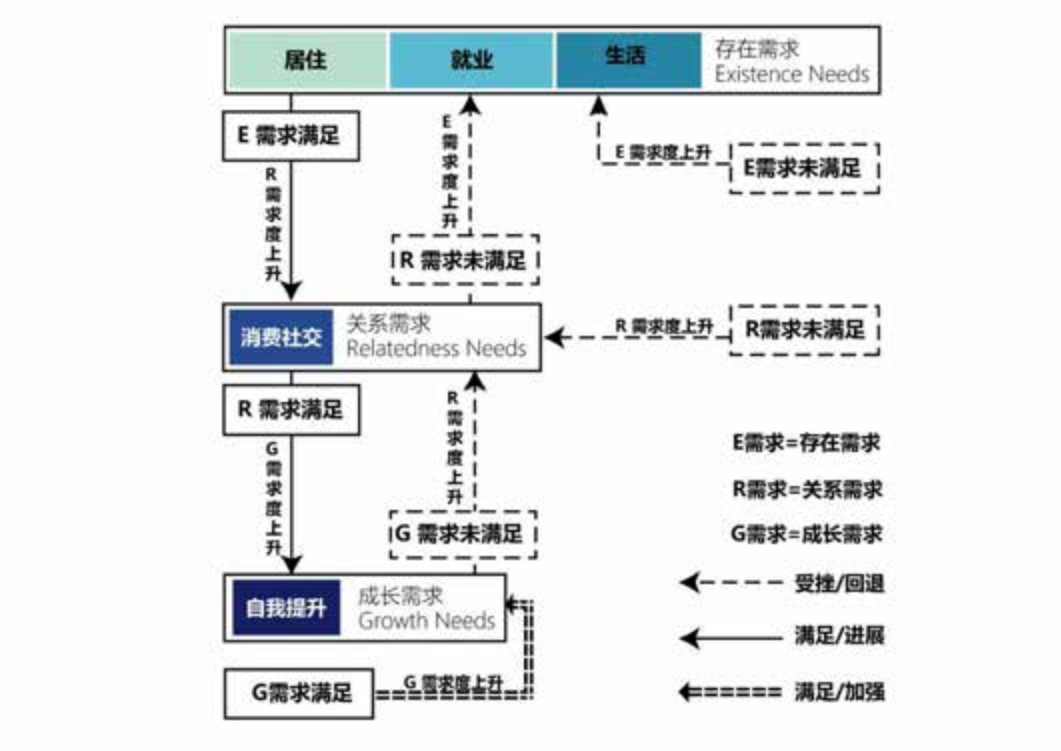


**Fig 5** Interactive Mechanisms of Gen Z's Need Hierarchies

***2.1.2 Analysis of Youth Development Needs***

Based on the characteristics and hierarchical needs of youth, this section summarizes the development needs of the youth group:

Existence needs include housing, employment, and basic living needs related to material security, serving as the foundation for personal development. Regarding housing, the "high atomization" characteristic of Generation Z youth leads to greater attention to rental housing and employer-provided talent housing, with a strong demand for affordable and flexible rental models. In terms of employment, Generation Z youth typically have higher educational attainment and thus exhibit a stronger desire for economic independence and financial freedom. They seek income and career prospects that match their educational qualifications and tend to pursue meaningful and fulfilling work, placing emphasis on opportunities for innovation, entrepreneurship, and career development pathways (Fig 6). For daily basic living, Generation Z has a high demand for online consumption; ordering takeout and purchasing daily necessities or medicines online have become integral parts of their everyday life.

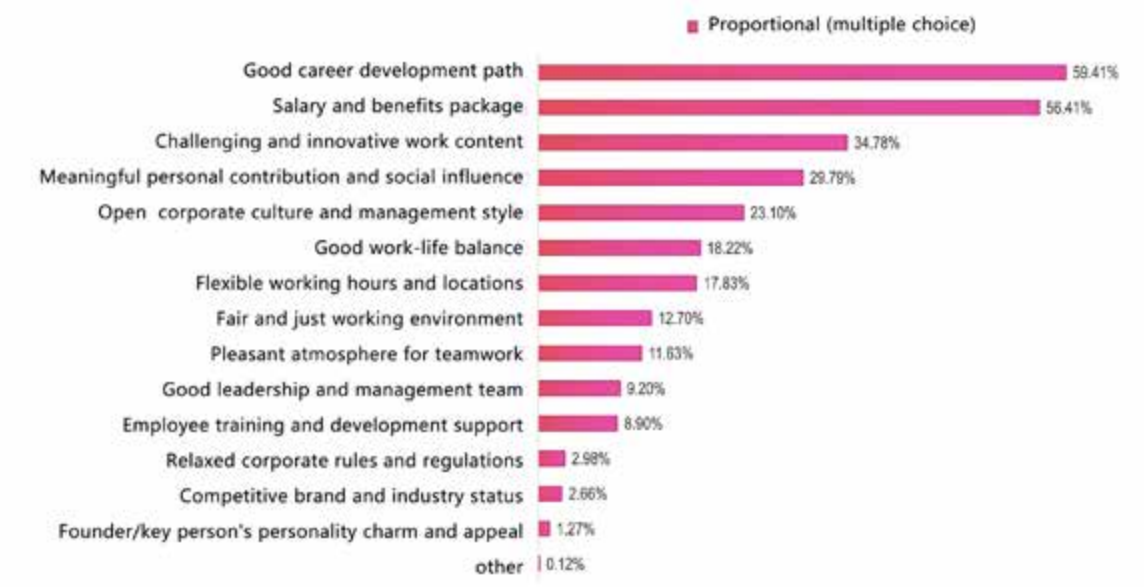


**Fig 6** Occupational Value Systems of Generation Z
Data Source: TTI Gen Z Workplace Expectations Report 2024

Relatedness needs reflect the importance of socialization for Generation Z youth, who satisfy their sense of belonging and interaction needs through social activities and community participation. Growing up in the internet era, Generation Z is adept at using digital media platforms for communication, yet they also have a strong desire for offline interactions, especially deep social connections based on shared interests and values. They tend to join communities aligned with their interests and beliefs, emphasizing individual uniqueness and contributions within groups. By providing creative social spaces, multicultural interaction platforms, and supporting interest-based clubs and public welfare activities, industrial communities can foster richer social participation and cultural exchanges among youth.

Self-growth needs refer to individuals' demands for potential development, value realization, and long-term growth, representing advanced needs for Generation Z youth. Influenced by fast-paced lifestyles and social competition, they place high importance on mental and physical health, investing significantly in fitness, body shaping, and wellness. Moreover, Generation Z values personalized development and unique cultural expression, favoring art, design, and new media forms for self-expression. They pursue continuous knowledge updating and skill enhancement, aiming to access educational resources at any time to adapt to the rapidly changing society.

### *2.2 Composition of Supply Subject Elements*

The city is analyzed as an integrated system (Fig 7). According to human settlement environment theory, it can be considered a system unit at the "community" level within the five hierarchical levels of human settlement environments: global – regional – city – community – building. This system contains five subsystems: population (man), society, shell, support network, and nature. These five subsystems collectively form the supply elements of youth development-oriented science and technology innovation industrial communities and correspond respectively to three types of capital in overall system analysis: human capital = population system + social system; structural capital = shell + support network; natural capital = various environments and resources. The specific interpretation of each subsystem in youth development-oriented science and technology innovation industrial communities is as follows:

**Population Subsystem:** This subsystem mainly targets the user populations within the industrial community, including employment groups, residential groups, and community managers.

**Social Subsystem:** This subsystem includes economic, socio-cultural, and government management aspects. Economically, it focuses on labor and employment, market trade, production, and consumption. In terms of socio-cultural and government management, it encompasses social medical and educational security, cultural activities organization, community management, and party-building activities.

**Shell Subsystem:** This includes spatial support systems such as housing, shops and malls, administrative offices, industrial facilities, and cultural and entertainment facilities, providing venues for human activities.

**Network Subsystem:** This refers to infrastructure networks such as water and electricity supply systems and transportation networks, linking various independent shells and forming the basic spatial organizational framework of the science and technology innovation industrial community.

**Natural Subsystem:** Serving as the "foundation" for the other subsystems, this includes natural resources such as land, water bodies, and vegetation. It should be noted that natural resources like water bodies and vegetation may be artificially modified and optimized through human activity, for example, by constructing artificial lakes and green parks.

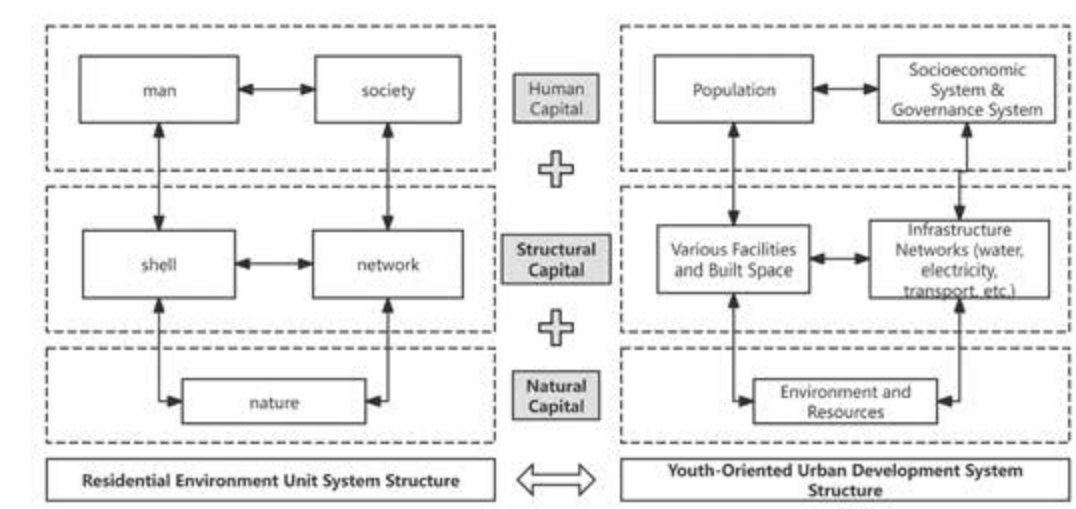


**Fig 7** Schematic Diagram of Youth Development-Oriented City System Framework

### *2.3 Construction of the Evaluation System*

The evaluation indicators are divided into three hierarchical levels: the goal layer, the criterion layer, and the implementation layer. The goal layer includes two main dimensions: the demand side and the supply side, referring respectively to youth's demand satisfaction and the urban supply level from the perspective of youth development. The criterion layer is classified in accordance with Maslow's hierarchy of needs theory, divided into five aspects: housing, employment, living, entertainment and consumption, and self-improvement. The criterion layer indicators on the demand side correspond one-to-one with those on the supply side. The selection of evaluation indicators at the implementation layer is based on the characteristics of youth development-oriented cities, youth demand preferences, and relevant academic studies on youth development city evaluation indicators, integrating these factors to construct a comprehensive indicator system (Table 1)

*Table 1 Integrated Evaluation Index System*

| Goal Layer | Criterion Layer | Implementation Layer Indicator | Indicator Evaluation Standard |
|---|---|---|---|
| Supply Side | Work-Living Level | Commuting Convenience | Average Commute Time |
| | | Housing Affordability and Friendliness | Average Income-to-Housing Price Ratio |
| | | Career Development Level | Average Graduate Salary |
| | Daily Life Level | Medical Supply Level | Number of Tertiary Hospitals |
| | | External Traffic Convenience | Cities Covered in 1-Hour High-Speed Rail Circle |
| | | Online Shopping Supply Level | Coverage Rate of Express Stations / Food Delivery |
| | | Daily Dining Supply Level | Convenience Store Coverage Rate |
| | Social Vitality Level | Shopping and Consumption Facility Supply Level | Commercial Area Foot Traffic |
| | | Public Social Space Supply Level | Coverage Rate of Coffee / Milk Tea Shops |
| | | Leisure and Entertainment Facilities Supply Level | Coverage Rate of Cinemas, KTVs |
| | | Youth Activity Organization Supply Level | Frequency of Various Cultural and Entertainment Events |
| | Self-Improvement Level | Sports and Fitness Facilities Supply Level | Number of Sports Venues |
| | | Cultural and Artistic Venue Supply Level | Coverage Rate of Specialty Bookstores |
| | | Park and Green Space Development Level | Quality of Green Spaces |
| Demand Side | Work-Living Level | Commuting Satisfaction | Satisfaction Survey Results |
| | | Housing Cost Satisfaction | |
| | | Career Development Satisfaction | |
| | Daily Life Level | Medical Support Satisfaction | |
| | | Traffic and Travel Satisfaction | |
| | | Online Shopping Satisfaction | |
| | | Dining Facility Satisfaction | |
| | Social Vitality Level | Shopping and Consumption Satisfaction | |
| | | Public Social Space Satisfaction | |
| | | Leisure and Entertainment Satisfaction | |
| | | Youth Activity Organization Satisfaction | |
| | Self-Improvement Level | Sports and Fitness Satisfaction | |
| | | Cultural and Artistic Venue Satisfaction | |
| | | Park and Green Space Satisfaction | |

### *2.4 Weights of Evaluation Indicators*

To scientifically determine the relative importance of indicators at each level in the youth development-oriented city evaluation system, this study employs an interactive weighting method. Using a digital questionnaire platform, a multi-dimensional weight allocation was implemented, with a dynamic matrix slider weighting mechanism designed to allow respondents to systematically allocate weights within a bounded rationality framework. The weight results of each indicator are shown in Table 2. The weights for the demand side and supply side indicators correspond to each other, each accounting for 50% of the total.

**Table 2** Comprehensive Evaluation Indicator System Weight Results

| Goal Level Indicator | Weight | Criterion Level Indicator | Weight | Implementation Level Indicator | Weight |
|---|---|---|---|---|---|
| Supply Side / Demand Side | 0.5 | Employment & Residence Level | 0.173 | Commuting Convenience / Commuting Satisfaction | 0.048 |
| | | | | Housing Affordability / Housing Cost Satisfaction | 0.071 |
| | | | | Career Development Level / Career Development Satisfaction | 0.053 |
| | | Daily Life Level | 0.128 | Medical Service Availability / Medical Service Satisfaction | 0.027 |
| | | | | External Transportation Convenience / Transportation Satisfaction | 0.033 |
| | | | | Online Shopping Availability / Online Shopping Satisfaction | 0.04 |
| | | | | Daily Dining Availability / Dining Facilities Satisfaction | 0.027 |
| | | Social Vitality Level | 0.111 | Shopping Facilities Availability / Shopping Satisfaction | 0.031 |
| | | | | Public Social Space Availability / Public Social Space Satisfaction | 0.033 |
| | | | | Leisure & Entertainment Facilities Availability / Leisure & Entertainment Satisfaction | 0.031 |
| | | | | Youth Activity Organization Availability / Youth Activity Organization Satisfaction | 0.017 |
| | | Self-Improvement Level | 0.089 | Sports & Fitness Facilities Availability / Sports & Fitness Satisfaction | 0.028 |
| | | | | Cultural & Artistic Venue Availability / Cultural & Artistic Venue Satisfaction | 0.029 |
| | | | | Park & Green Space Development Level / Park & Green Space Satisfaction | 0.032 |

## 3. Empirical Evaluation: Taking Shanghai, Hangzhou, and Nanjing as Examples

### *3.1 Research Scope and Basic Situation*

This study selects Shanghai, Hangzhou, and Nanjing as empirical evaluation targets. As core cities of the Yangtze River Delta, these three cities exhibit significant and typical structural characteristics in their youth populations. Shanghai, as a mega-city, had youth aged 14–35 accounting for 29% of its population in 2022, concentrating 19% of the nation's innovation and entrepreneurship enterprises, thus forming a "high-level employment – high-density agglomeration" characteristic. Hangzhou, relying on its digital economy ecosystem, had a youth population aged 14–35 reaching 5.13 million by the end of 2022, accounting for 34.6% of the city's total population, showing a resonance of "industrial youthfulness – population youthfulness." Nanjing, known for its strong higher education advantages with over 900,000 university students, also has a youth population proportion exceeding the national average in all three cities.

### *3.2 Evaluation Results*

#### *3.2.1 Supply Side Evaluation Results*

Through an in-depth analysis of supply-side implementation-level indicators in Shanghai, Hangzhou, and Nanjing, differentiated characteristics and optimization pathways of urban youth development efficiency are revealed(-Fig 8). The comprehensive evaluation results show Hangzhou ranked first with a score of 11.88, followed closely by Nanjing (11.60) and Shanghai (11.51), with less than a 3% difference among the three cities, reflecting a trend of homogenized youth service supply in the Yangtze River Delta urban cluster. Specifically, Hangzhou leverages the deep penetration of the digital economy, leading in seven indicators including shopping and consumption facilities supply, daily dining density, cultural and artistic venue availability, and leisure and entertainment facilities. Nanjing excels in livelihood services, with comprehensive advantages in housing affordability and online shopping supply, but its youth activity organization supply (0.430) is only 43% of Shanghai's, revealing weaknesses in community operation capacity. Shanghai maintains the lead in hard resources such as career development level, medical resource supply, and external transportation convenience, but the housing cost pressure far exceeds that of Nanjing and Hangzhou, urgently needing to resolve the "high-level resource – high-cost" development paradox.

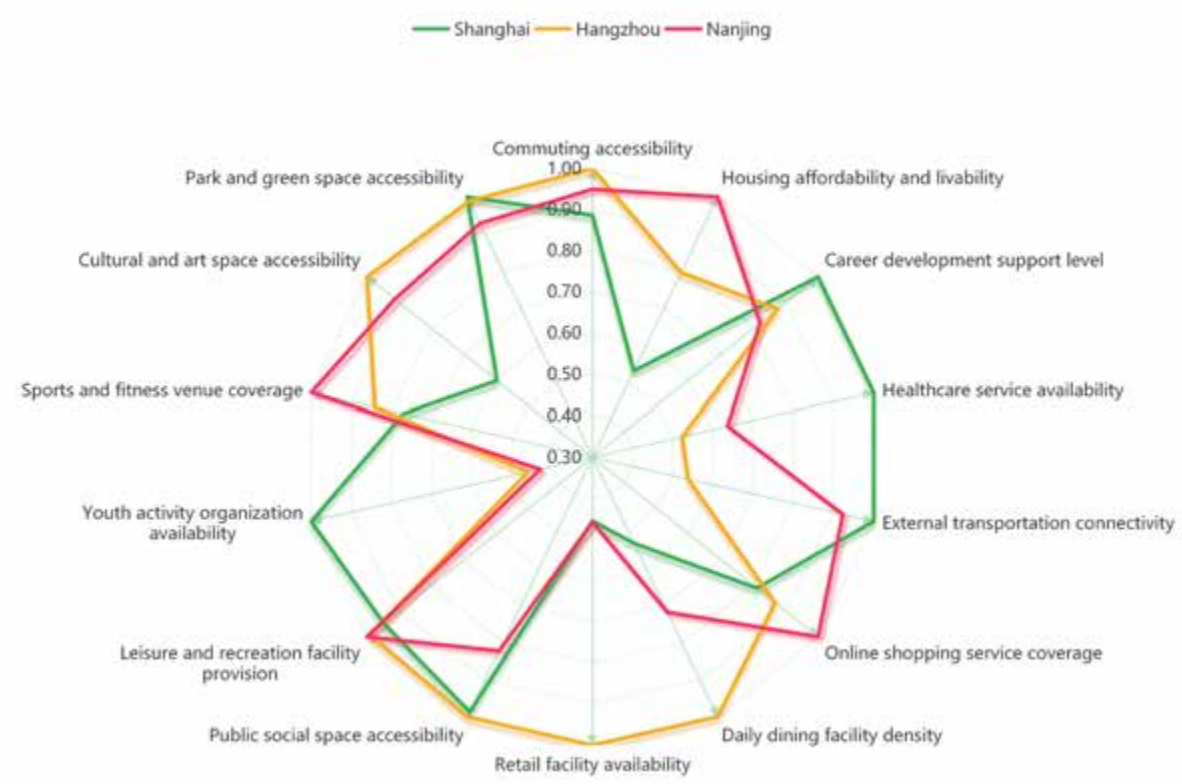


**Fig 8** Shanghai-Nanjing-Hangzhou Tri-City Supply-Side Evaluation Results

#### *3.2.2 Demand Side Evaluation Results*

Based on empirical data analysis of youth development satisfaction in Shanghai, Hangzhou, and Nanjing, the study finds differentiated characteristics in youth development quality across the Yangtze River Delta urban cluster(Fig 9). From the overall average score, Nanjing ranks first with 3.258, followed by Hangzhou (3.200), and Shanghai lags behind at 3.001, reflecting the transformation pressures faced by mega-cities in youth development.

In the dimension of basic survival quality, housing cost and commuting efficiency are critical constraints. Housing cost satisfaction in all three cities is below the 3.0 benchmark, showing a "Yangtze River Delta youth housing anxiety belt" phenomenon, with Shanghai experiencing the most severe housing pressure (2.52), 8.3% lower than Nanjing. Relying on innovative affordable housing policies, Nanjing achieves a significant advantage with a survival quality score of 3.07. Shanghai faces the diminishing marginal benefits of its mega-city commuting network, with a transportation satisfaction of 3.12, significantly lower than Hangzhou (3.44) and Nanjing (3.43), exposing risks of service quality degradation due to rail transit over-saturation.

Public service supply shows gradient differentiation. Benefiting from its rich cultural capital, Nanjing leads in cultural and artistic venue satisfaction (3.64) and park green space (3.33), verifying the spatial empowerment effect of historic heritage revitalization. Driven by digital technology innovation in public services, Hangzhou's youth activity organization satisfaction reaches 3.71, forming an advantage in social vitality, with leisure and entertainment indicators 41.6% higher than Shanghai, highlighting the spillover benefits of the digital entertainment industry cluster. Although Shanghai maintains its traditional advantage in career development potential (2.88), its fragmented public social spaces (3.24) reveal community alienation issues during modernization.

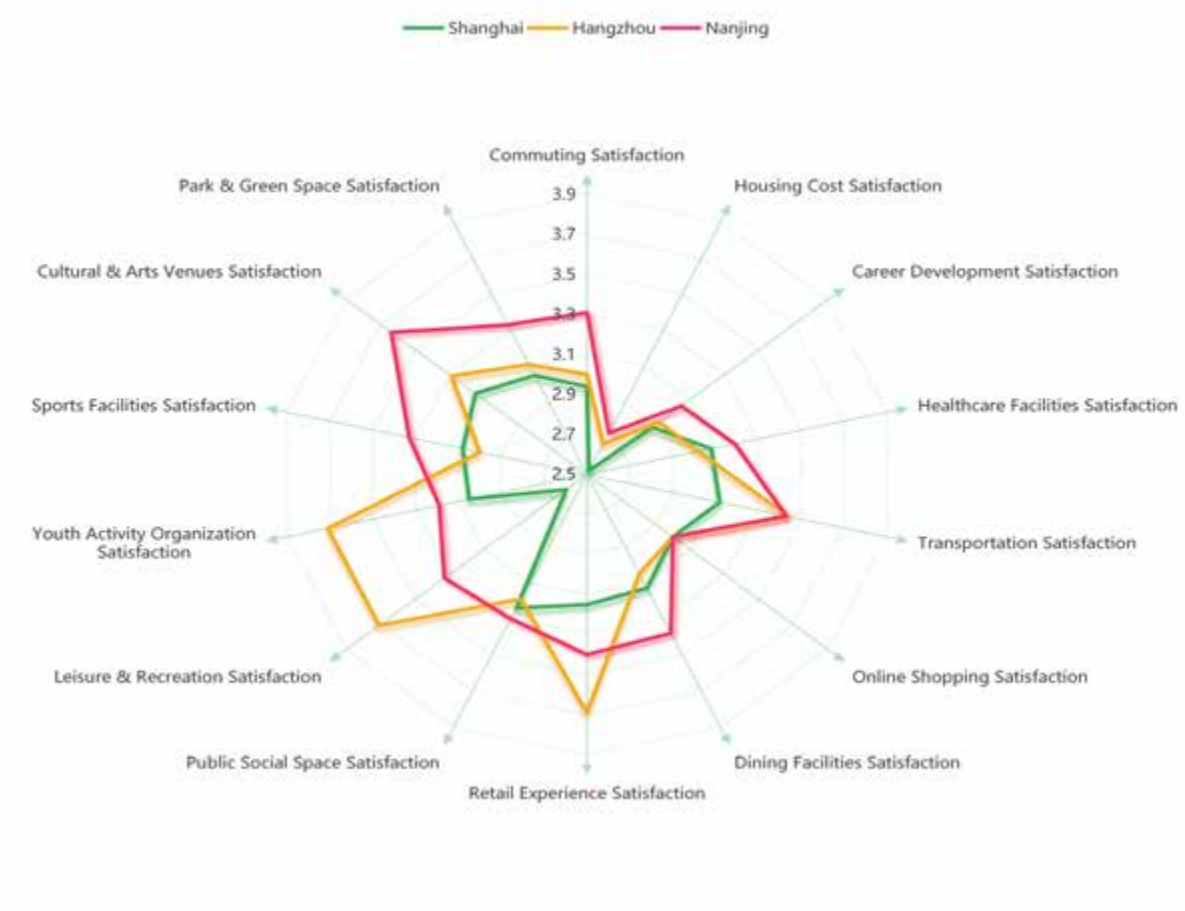


**Fig 9** Shanghai-Nanjing-Hangzhou Tri-City Demand-Side Evaluation Results

### *3.2.3 Comprehensive Supply-Demand Analysis Results*

The evaluation indicates varying degrees of supply-demand mismatch across Shanghai, Nanjing, and Hangzhou-Fig 10 A deeper analysis of youth development dynamics in these three Yangtze River Delta cities reveals differentiated characteristics. Hangzhou demonstrates the strongest alignment with Generation Z demands, achieving the highest congruence between urban resource supply and youth needs through optimized spatial planning

and resource allocation. In contrast, Shanghai exhibits relatively abundant supply-side resources but lower demand-side satisfaction among youth, indicating deficiencies in the targeting and precision of spatial elements and service provision. This necessitates enhanced supply orientation and adaptability to better accommodate the diversified needs of young populations. Nanjing presents a reverse pattern, with higher demand-side satisfaction but insufficient supply-side capacity, reflecting proactive attention to youth demands yet persistent shortages in critical supply elements such as housing, employment, and public services.

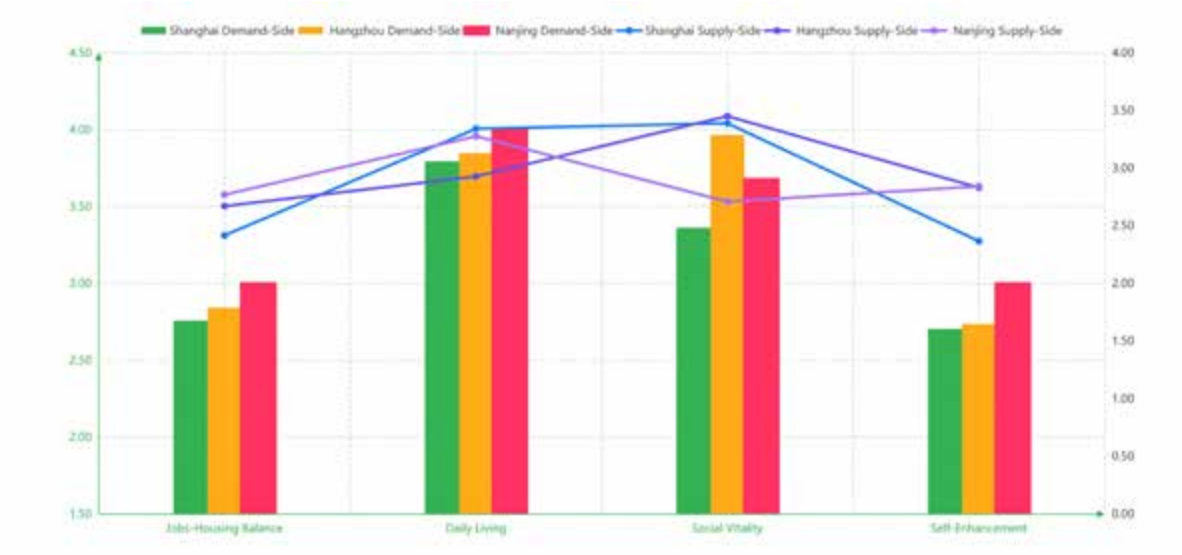


**Fig 10** Supply-Demand Alignment Assessment in the Shanghai-Nanjing-Hangzhou Tri-City Region

The core cities of the Yangtze River Delta exhibit distinct youth attraction profiles shaped by their functional positioning and developmental trajectories. As a global metropolis, Shanghai holds clear advantages in public service provision and transportation infrastructure. Its tertiary hospital system and international healthcare networks form a robust health security framework, while high-speed rail hubs enable a two-hour connectivity circle within the Yangtze River Delta, facilitating cross-regional mobility for young populations. However, urban expansion has intensified spatial contradictions, with escalating housing costs and prolonged commutes in central areas creating compound pressures that undermine residential stability for youth.

Hangzhou leverages its digital economy-driven innovation ecosystem to foster unique advantages in youth social network development. Internet industry-enabled diversified social platforms and innovative professional communities provide nontraditional pathways for self-improvement. The integration of natural landscapes with digital economic features creates hybrid work-life spatial models. Yet, industrial structure homogeneity reduces labor market inclusivity, where technical thresholds may constrain career development opportunities for certain youth groups.

Nanjing demonstrates multidimensional equilibrium in its youth support system. The geographic integration of higher education resources and industrial parks establishes an industry-education-research collaboration model. Coordinated spatial planning between rail transit networks and employment centers maintains reasonable commuting durations. The synergistic evolution of historical cultural heritage and modern industrial systems cultivates an urban environment balancing cultural identity and professional growth. However, limited capacity in aggregating international high-end resources due to city-tier constraints may affect long-term retention of high-caliber young talent.

## Conclusion

This study constructs an evaluation system for youth development-oriented cities based on spatial supply and demand theory, aiming to provide relevant authorities with scientific and reasonable criteria to accurately assess the progress of youth development city construction. The empirical analysis results of Shanghai, Nanjing, and Hangzhou reveal certain mismatches between supply and demand in the construction process of youth development-oriented cities. In future development, it is necessary to further integrate the characteristics and needs of the youth population to explore and form a sustainable and targeted model for building youth development-oriented cities.

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