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Preschool Teacher Development in China: Insights from Japan and South Korea's Responses to Population Aging

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Abstract: With the declining birth rate and the exacerbation of aging in China, the construction of preschool education teacher programs faces unprecedented challenges. To address these challenges, it is imperative to draw insights from the successful experiences and lessons of Japan and South Korea. Both countries have adopted different strategies in response to their population crises, particularly in the realm of preschool education teacher development. By conducting a comparative analysis of these strategies, the commonalities and differences can be identified. An urgent task is to improve the provision of nursery services for children under three years old, enhance incentives for childbirth, and establish an early warning mechanism for population trends to optimize the allocation of educational resources. Additionally, efforts should focus on enhancing the quality of teachers and expanding employment opportunities to mitigate the impact of the population crisis on the high-quality and balanced development of preschool education teachers.

Keywords: Population forecast; Demand for educational resources; Experience and lessons

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1. Introduction

The aging population and the persistent decline in birth rates present a challenging scenario for China's population dynamics. The dwindling fertility rate poses a serious threat to the development of the national education ecosystem, with far-reaching implications for the education system as a whole. Particularly in the realm of preschool education, adapting to the shifting population demographics has emerged as a pressing concern. Against this backdrop, the experiences and insights gleaned from Japan and South Korea in the realm of preschool education teacher training hold significant relevance.

In 2023, South Korea recorded its lowest-ever birth rate, with only 235,000 births, marking a decline of over 120,000 births. According to the "Population Trends in May 2023" report by the Korea Census Bureau, released on July 26, 2023, there were 18,988 newborns in South Korea in May alone, reflecting a year-on-year decrease of 5.3% [1]. Similarly, Japanese newspaper Asahi Shimbun reported on January 3, 2023, that Japan also witnessed the lowest-ever record of 722,000 newborns. China's birth population in 2023 also hit a historic

lowest of 9.02 million, with a fertility rate even lower than that of Japan. This grim reality underscores the bleak outlook of population development in these three East Asian nations.

The fertility rate serves as a crucial indicator of a country's demographic health. According to the United Nations' World Population Prospects 2022 report, the top 10 countries with the lowest fertility rates include South Korea (0.874‰), Singapore (1.035‰), Andorra (1.135‰), San Marino (1.138‰), China (1.175‰), Malta (1.25‰), Ukraine (1.27‰), Spain (1.29‰), Italy (1.29‰), and Japan (1.31‰), as depicted in **Figure 1** (data sourced from the United Nations' World Population Prospects statistical data).

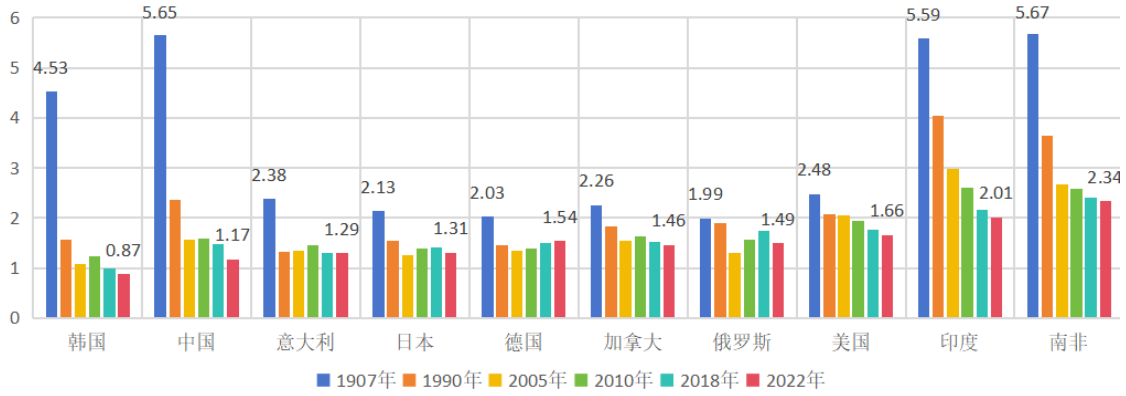

Figure 1. 1907–2022 statistical changes in the total fertility rate of major countries in the world. Left to right: South Korea, China, Italy, Japan, Germany, Canada, Russia, U.S.A., India, South Africa.

Figure 1 illustrates the substantial decline in fertility rates across the three East Asian countries over the past century, positioning them among the global leaders in this demographic trend. Looking ahead, South Korea's population is projected to experience exponential decline, closely followed by China, further accentuating the urgency of addressing population-related challenges.

2. The current configuration of preschool teachers

2.1. The development of preschool education

2.1.1. South Korea

The Ronam Kindergarten, founded by Mr. Shizong Zheng in 1909 in North Hamgyong, stands as the earliest kindergarten in South Korea. Following this, the first public kindergarten, Cheongju Kindergarten, was established in 1947. Subsequently, South Korea implemented policies such as the "Kindergarten Education Curriculum" in 1969 to foster the growth of preschool education. This marked the onset of rapid advancement in South Korean preschool education.

From the 1970s onward, the predominant presence in South Korean preschool education gradually shifted from private to public entities. By the early 21st century, South Korean preschool education has achieved a degree of standardization. In 2004, South Korea enacted the "Early Childhood Education Law," providing a legal framework for preschool education. The law underwent revisions in 2012 to stipulate that the state and local governments would bear the full or partial costs of preschool education for children belonging to specified categories as per the "National Basic Life Security Law" and presidential decrees [2].

In 2018, the Ministry of Education in South Korea introduced the "Basic Plan for the Development of Early Childhood Education (2018–2020)," aimed at broadening early childhood education opportunities, balancing and expanding public education across all regions, continually easing parental financial burdens, fortifying support and management systems for private kindergartens, and fostering new avenues for development [3].

2.1.2. Japan

In 1872, the Meiji government enacted Japan's first modern educational ordinance, known as "The School System Ordinance." Subsequently, in 1876, Japan established its inaugural kindergarten, the Tokyo Women's Normal School Kindergarten, marking the inception of public preschool education in the country. By 1890, Japan had established its first crèche, followed by the promulgation of the initial official ordinance on early childhood education in 1899, titled "Regulations on Kindergarten Care and Equipment." At that time, Japan boasted 229 kindergartens with over 20,000 enrolled children [4].

In 1926, Japan introduced its first comprehensive preschool education ordinance, "The Kindergarten Ordinance." Despite fluctuations due to World War II, the number of kindergartens in Japan experienced growth and subsequent decline. By 1985, Japan counted 15,220 kindergartens nationwide, with 41% being public institutions, and enrollment surpassing 2 million children [5]. During the 1960s, Japan launched several pivotal initiatives to invigorate preschool education, including the "7-Year Plan for Early Childhood Education" in 1962, the "10-Year Plan for the Revitalization of Early Childhood Education" in 1972, and the "Revitalization Plan for Early Childhood Education" in 1991. These plans aimed to ensure universal access to kindergarten education for all 3 to 5-year-olds within the subsequent decade, allocating special funds from the budget for kindergarten construction or renovation.

By 1980, kindergarten enrollment had surged to 2.4 million children, marking a tenfold increase over the preceding 30 years. On June 1st, 2023, the Future Children Strategy Committee reviewed and endorsed the "Draft Future Children Strategy," intending to foster high-quality development in preschool education, reduce childcare burdens, and realize a "universal child daycare system for all" [6].

2.1.3. China

During the late Qing Dynasty, the first education system, known as the "Imperial School Regulations," was promulgated in 1902. This marked the initial integration of preschool education into the Chinese educational framework. In 1903, the Qing government established China's first kindergarten, the "Hubei Kindergarten," followed by the promulgation of the "Guimao Xuezhi" (癸 卯 学 制) legislation in 1904. This officially incorporated preschool education into the national education system, thereby establishing China's public preschool education system.

At the inception of New China in 1949, there were 1,300 kindergartens nationwide, with over 130,000 children enrolled. In 1950, China adopted international preschool education experiences and models, leading to the issuance of the "Decision on Reforming the School System" in 1951. This decision marked a significant milestone in the scientific and planned development of preschool education in China. However, during the period from 1966 to 1976, preschool education in China faced severe disruptions and stagnation.

Following the reform era, preschool education development gradually regained momentum. The state enacted the "Regulations on Kindergarten Work (Trial)" to underscore the crucial role of preschool education. From 1977 to 2000, the total number of kindergartens in China surged to over 180,000. However, state-owned enterprise reforms led to the "closing, merging, and transforming" of kindergartens, resulting in a rapid reduction to over 110,000 kindergartens.

Since 2001, the state has issued multiple directives, including the "Outline of Preschool Education Guidance (Trial)," fueling rapid development in kindergartens. By 2022, the gross enrollment rate of preschool education had reached 89.7%. Over the past two decades, the number of children enrolled in kindergartens has more than doubled [7].

2.2. The current situation of preschool education teacher development

2.2.1. The current situation of teacher development

With the advancement of society and increased government attention, China, Japan, and South Korea have achieved remarkable progress in preschool education. Resources for preschool education have seen continuous improvement and enrichment, and both the quantity and quality of teachers have undergone rapid development (**Table 1**). However, in recent years, issues in preschool education have been on the rise due to population aging. Challenges include regional disparities in educational resources, the coexistence of "teacher shortage" and "teacher surplus," and significant attrition among rural preschool teachers. These factors contribute to escalating conflicts between the phenomenon of teacher vacancies and the clustering of teachers in urban areas.

Table 1. The number of on-campus children, preschool teachers, and the development of kindergartens in China, Japan, and South Korea from 2011 to 2022

Year	China			Japan			South Korea		
	On-campus children	Preschool teachers	Kindergartens	On-campus children	Preschool teachers	Kindergartens	On-campus children	Preschool teachers	Kindergartens
2011	3,424.45	131.56	16.68	159.62	11.04	1.33	56.48	3.87	0.84
2012	3,685.76	147.92	19.86	160.42	11.08	1.32	61.37	4.22	0.85
2013	3,894.70	166.35	19.86	158.36	11.11	1.30	65.82	4.61	0.87
2014	4,050.71	184.41	20.99	155.75	11.11	1.29	65.25	4.85	0.88
2015	4,264.83	205.10	22.37	140.24	10.15	1.17	68.26	5.10	0.89
2016	4,413.86	223.21	23.98	133.98	9.99	1.13	70.32	5.29	0.90
2017	4,600.14	243.21	25.50	127.19	9.78	1.08	69.35	5.38	0.90
2018	4,656.42	258.14	26.67	120.79	9.56	1.05	67.60	5.49	0.90
2019	4,713.88	276.31	28.12	114.56	9.36	1.01	63.35	5.34	0.88
2020	4,818.26	291.34	29.17	107.85	9.18	0.97	61.22	5.37	0.87
2021	4,805.21	319.10	29.48	100.90	9.02	0.94	58.22	5.36	0.87
2022	4,627.55	324.42	28.92				55.28	5.37	0.86

The data are obtained from the following websites: Chinese Ministry of Education "Annual Education Statistics of the Year of History" (http://www.moe.gov.cn/jyb_sjzl/); Japanese Ministry of Education, Culture, Sports, Science and Technology (https://www.mext.go.jp/); Korean National Statistical Service's (https://kostat.go.kr/portal/korea/index.action).

2.2.2. The situation of preschool teacher staffing

In terms of enrollment rates (**Table 2**), Japan has essentially achieved full coverage of preschool education. China's kindergarten enrollment rate reached 89.7% in 2022, marking a 27.4 percentage point increase from 2011. However, South Korea's kindergarten enrollment rate remains relatively low, with less optimistic development over the past decade.

Furthermore, regarding the student-to-teacher ratio, both Japan and South Korea maintain lower ratios, which have steadily declined over the years. In 2011, China's student-to-teacher ratio was 1.8 times higher than that of Japan and South Korea. However, significant reductions have occurred over the past decade, narrowing the gap. Nonetheless, there remains a shortage of kindergarten teachers.

Additionally, the impact of population aging on the preschool education teacher workforce is becoming increasingly evident. In Japan and South Korea, the unemployment rate among kindergarten teachers has risen annually due to population aging. China's construction of preschool education teachers will also encounter substantial challenges in this regard.

Table 2. The enrollment rate and the teacher-student ratio of kindergartens in China, Japan, and South Korea from 2021 to 2022

Year	The student-teacher ratio			The enrollment rate (%)	
	China	Japan	South Korea	China	South Korea
2011	26.1	14.5	14.6	62.3	41.1
2012	24.9	14.5	14.5	64.5	44.2
2013	23.4	14.3	14.3	67.5	47.4
2014	22.0	14.0	13.4	70.5	47.3
2015	22.8	13.8	13.4	75.0	49.4
2016	19.8	13.4	13.3	77.4	50.7
2017	18.9	13.0	12.9	79.6	50.7
2018	18.0	12.6	12.9	81.7	50.6
2019	17.1	12.2	11.9	83.4	48.7
2020	16.5	11.7	11.4	85.2	49.0
2021	15.1	11.2	10.9	88.1	50.6
2022	14.3	10.5	10.3	89.7	52.7

Japan launched the "Second Kindergarten Promotion Plan" in 1972 and subsequently achieved full preschool education coverage, thus the enrollment rate is not further analyzed.

3. The demand for preschool education resources in the context of low fertility rates

3.1. South Korea

Data from the South Korean Statistical Agency reveals that over half of the regions in South Korea have experienced a significant decline in newborn numbers. Over the past four years, more than 8,000 kindergartens have been forced to close, resulting in a substantial number of unemployed or redeployed early childhood educators. The government's 2022 educational statistics indicate that small-scale kindergartens, each with one class, constitute 49.6% of all public kindergartens in the country. In comparison with 2018, kindergarten enrollment has decreased by 18.2% in 2022 and is projected to decline even further over the next five years, with an anticipated 32% decrease from 2022. The population of 3–5-year-old children (in ten thousand people) has decreased from 135.5 in 2018 to 108.9 in 2022, with further anticipated declines to 98.5 in 2023 and 73.9 in 2027 (**Table 3**).

Table 3. Development trend of kindergarten classes and number of children in South Korea from 2018 to 2022

Years	2018	2020	2022	Increase/decrease compared with 2018
The recognized classes (in kindergartens)	37,748	36,634	35,799	↓ 5.1%
The children enrolled (in kindergartens)	675,998	612,538	552,812	↓ 18.2%
The teacher enrolled (in kindergartens)	65,631	59,470	53,671	↓ 18.2%

Data was obtained from the "Third (2023–2027) Development Plan for Preschool Education" released by the South Korean Ministry of Education on April 10, 2023. The number of teachers is calculated based on the latest student-teacher ratio of 1:10.3 in Japan.

3.2. Japan

The impact of low fertility rates has led to a continual decline in the number of kindergarten-aged children in Japan. In 2019, the kindergarten-aged population in Japan was less than 1.2 million, marking a halving over the subsequent 30 years (**Table 4**). It is noteworthy that Japan boasts the world's highest kindergarten enrollment rate, and recent years have witnessed near-universalization of preschool education. Consequently, the decline in kindergarten-aged children primarily stems from reduced newborn numbers.

Table 4. Japan's population development, kindergarten seat and teacher demand from 2021 to 2030

Years	Number (10,000 people)					Rate (‰)	
	Number of births	Number of deaths	Natural growth	Degree demand	Teacher demand	Birth rate	Natural growth
2021	81.2	143.8	-625	292.86	27.89	6.3	-5.1
2022	77.7	15.24	-758	284.14	27.06	6.3	-6.2
2023	73.9	14.82	-743	272.97	26.00	6.1	-6.1
2024	75.5	14.99	-744	262.44	24.99	6.3	-6.2
2025	74.9	15.16	-767	251.76	23.98	6.2	-6.4
2026	74.4	15.32	-787	242.99	23.14	6.2	-6.6
2027	74.3	15.46	-803	232.81	22.17	6.3	-6.8
2028	74.4	15.60	-816	227.15	21.63	6.3	-6.9
2029	74.3	15.73	-830	224.30	21.36	6.4	-7.1
2030	74.1	15.85	-843	224.80	21.41	6.4	-7.3

Data on births, deaths, and natural growth in Japan are estimated by the median birth/death method based on data published by the Japanese Statistics Bureau. Since the newborn mortality rate in Japan is very low at 1.9‰, the demand for kindergarten seats is calculated as the total number of children aged 3–6 years old, without considering this factor. The raw data come from the National Institute of Population and Social Security Research of Japan's "Summary of the Projected Population of Japan (FY 2050)."

3.3. China

China experienced negative growth in the number of kindergarteners in 2021 due to a sudden drop in the birth rate. The Ministry of Education of China released the "2022 National Education Development Statistical Bulletin," indicating 289,200 kindergartens in China by the end of 2022, a decrease of 5,610 compared to the previous year. The number of kindergarteners also decreased by 1,776,600, a decline of 3.7%. Utilizing CPPS population software, this study predicted the kindergarten-aged population based on China's Seventh National Census data (**Table 5**).

Additionally, correlation analysis was conducted to examine the relationship between teacher demand and degree demand, revealing a positive correlation among 3-year-olds, 4-year-olds, and 5-year-olds. The sharp decline in China's preschool-aged population has consequently reduced degree demands, leading to a significant decrease in the demand for preschool teachers.

Table 5. Predicted results of the number of kindergarten-aged population and the degree demand from 2023 to 2030 (unit: 10,000 people)

Year	3-year-old	4-year-old	5-year-old	Degree demand	Teacher demand
2023	263.52	316.22	335.68	915.42	61.03
2024	260.35	263.47	316.17	839.99	56.00
2025	252.06	260.30	263.43	775.79	51.72
2026	243.92	252.01	260.26	756.79	50.45
2027	236.21	243.92	251.97	732.1	48.81
2028	229.13	236.21	243.83	709.17	47.28
2029	222.89	229.09	236.13	688.11	45.87
2030	217.71	222.85	229.05	669.61	44.64

Data was obtained from the 2020 Seventh National Census data as the benchmark data, combined with educational bulletins and relevant United Nations data to predict the relevant data of preschool mobile children from 2023 to 2030. Teacher demand = degree demand ÷ 15. Based on the teacher-student ratio average of 1:15 set in the "Interim Measures for the Assignment of Kindergarten Staff and Personnel (Provisional)" issued by China.

4. The impact of low fertility rates

4.1. Declining teacher employment

Firstly, according to the Korean Statistical Information Service, out of the 228 regions in Korea in 2022, 136 regions had fewer than 1,000 newborns. The South Korean newspaper reported that the number of teachers in public kindergartens, primary schools, middle schools, and high schools in Korea would be reduced to 344,906, a decrease of 2,982 compared with the previous year [8]. Simultaneously, due to the sharp decrease in students, many kindergartens have been converted into nursing homes, leading to a significant reduction in the number of kindergarten teachers. In 2023, 7,000 kindergartens closed down.

Secondly, in Japan in 2015, the Ministry of Finance requested the Ministry of Education to cut 37,000 teachers nationwide. In 2016, the Ministry of Finance announced that nearly 50,000 primary and secondary school staff would be laid off. Over the past decade, more than 300 schools have closed down every year in Japan, and many kindergartens have permanently closed down.

Finally, concerning China, the impact of low fertility on teachers is becoming increasingly severe. In the first half of 2023, China experienced its "first round of kindergarten closures," resulting in significant changes for kindergarten teachers. Based on China's official documents stipulating an average teacher-student ratio of 1:15, approximately 127 kindergarten teachers will face unemployment.

4.2. Declining student numbers and teacher shortages

In June 2023, Japanese official media highlighted that Japan's aging population is outpacing expectations in the education sector, leading to the closure of 200 universities due to a lack of students. Gakushuin University and Kobe Seiko Gakuin University have publicly announced the cessation of student admissions.

In 2021, many first-tier city schools in South Korea had fewer than 50 students. According to information from the South Korean Ministry of Strategy and Finance, the Ministry of Public Administration and Security, and the Ministry of Education, the public teacher quota of 2024 will be set at 342,388 people, a decrease of 2,982 compared with 2023. The South Korean National Law Information Center published a table of national civil service quotas for public schools at all levels, indicating reductions in the number of teachers in various fields.

Primary and secondary school teachers and kindergarten teachers account for 85% of these reductions. In 2021 and 2022, the number of primary and secondary school teachers and kindergarten teachers decreased by 351 and 1,039 respectively compared to the previous year.

There are numerous "hollow kindergartens" in rural China. Despite the current shortage of kindergarten teachers, with the sharp population decline, the employment prospects for education graduates are worrisome.

5. Countermeasures for preschool education teacher development

5.1. Improving the friendly childcare service policy to increase fertility intentions

Firstly, the low fertility rates in Japan and South Korea preceded that in China, thus the measures taken by these two countries to address population issues can offer valuable insights to China. From 1994 to 2023, Japan implemented various childcare policies such as the "Angel Plan," the "Specific Implementation Plan for Focusing on Countermeasures against Childlessness," and the "Child and Childcare Assistance Law" [9]. Similarly, South Korea began encouraging fertility in 2003 and established its first basic plan in 2006 to foster a child-friendly social environment. It emphasized the participation of social entities and the expansion of diverse and high-quality childcare infrastructure. Drawing from these experiences, China can enhance the construction of diversified service methods and channels, improve service quality and efficiency, expedite the cultivation of professional talent teams, support diverse childcare service methods, and promote diverse entities in running schools. Concurrently, it can promote the implementation of fertility policies, such as reducing educational costs for families with multiple children, to increase fertility intentions.

5.2. optimizing teacher resource allocation based on population prediction

The factors influencing population dynamics are complex, with significant variations in population size, structure, fertility rate, and urbanization rate across different regions. Consequently, conducting comprehensive analyses of birth population scale and direction becomes highly uncertain. Population prediction research is thus conducted using census data, with adjustments and optimizations made to predict results based on emerging social phenomena and issues. Strengthening population monitoring and prediction enhances the national management system for changes in population structure, monitoring fertility trends to more accurately evaluate population changes and the number of newborns. Teacher allocation is adjusted and optimized in accordance with population changes and trends. Based on population density and specific needs, the spatial layout of educational resources is improved to match the adaptability of service subjects. The teacher team is scientifically allocated, establishing quotas for college students majoring in education according to actual teacher needs, and cultivating "quasi-teachers" in line with development trends to reasonably replenish teacher resources. Actively planning the teacher allocation mechanism helps avoid resource wastage.

5.3. Coordinating teacher teams and promoting high-quality teacher sharing

Encouraging kindergarten teachers to transition to childcare teacher groups enhances the quality of teacher training and broadens professional planning and channels for preschool teachers. This elevates the overall quality and work skills of the teacher team, enhancing teacher competitiveness. "Excess" teachers are reassigned or redeployed, receiving professional training in "nurturing" or "infant care" and transferring to inclusive childcare services institutions such as nurseries, early education centers, or baby centers. Alternatively, establishing an integrated service system allows "excess" teachers to receive professional training and be redeployed for childcare-related work. This not only resolves the issue of "excess" kindergarten teachers but also effectively promotes the construction and implementation of inclusive childcare service systems in China.

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