

The Present Situation and Trend of Preschool Education in China Under the Framework of Supply and Demand Theory

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ABSTRACT

This article first explains the definition of preschool education categories, combing its historical evolution. Next, the author starts to conduct research on the status quo of preschool education in China from the theoretical analysis framework of supply and demand. On the demand side, this paper starts from the policy, economic and social aspects. On the supply side, the author draws the upper, middle and downstream industrial chain of preschool education, and puts forward the problems such as the lack of teachers and concepts, and the incomplete evaluation criteria. Finally, this paper discusses the future development trend of the industry, and explores the development direction with the typical case of VTRON, in order to provide advices and suggestions for preschool education practitioners.

Keywords: *Preschool Education, Teacher Construction, Educational Concept, Educational Information, Home-school Interaction*

1. INTRODUCTION

Preschool education is an education that parents and kindergarten teachers use various methods to provide systematic and planned scientific stimulation of their brains in order to achieve the purpose of promoting the perfection of various parts of the children's brain. Generally, preschool education in the broad sense refers to education for children from birth to 6 years old, while preschool education in the narrow sense refers to education for children aged 3 to 6 years old. The preschool education referred to in this paper is preschool education in a broad sense. As shown in Figure 1, preschool education is divided into different forms according to different criteria: according to the content of preschool education, it can be divided into preschool children health education, language education, science education, social education, art education, moral education, aesthetic education and so on.

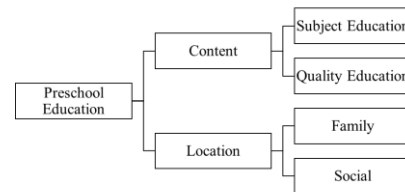


Figure 1 Schematic diagram of the definition of preschool education

From the perspective of the development history of the preschool education industry, as FIG.2 displays, it can be roughly divided into four stages: the first stage is the period of extensive trustees (before 1990). At this stage, the main functions of kindergartens met the needs of trustees and collective childcare formed by a large number of women after they entered the workplace; The second stage is the period of intellectual education (1990-2004). With the increase of per capita income, early childhood education gradually attracted attention, and intellectual development gradually became the central idea. The center of early childhood education revolved around the number of literacy and numeracy. The third stage is the comprehensive training period (2004-2014), the early childhood education from the "intellectual education center" to the comprehensive development of children, children's physical,

intellectual, moral, aesthetic, character, social, emotional intelligence and other aspects of the development of attention. The fourth stage is the initial stage of upgrading (after 2014). 1) Educational content and service form will present the trend of informatization and pan-entertainment; 2) Inclusive education courses for children will be gradually standardized and enter the stage of scientific, theoretical support and professional development; 3) Children's high-end elite education courses will be diversified, with children's quality training, computer programming learning and other featured themes of early childhood education courses popular.

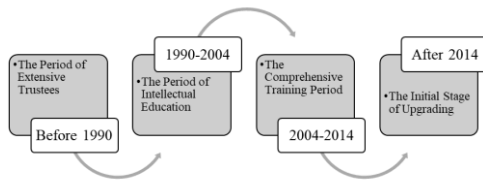


Figure 2 The development history of the preschool education industry

In terms of theoretical significance, (1) in terms of research content, the author found that few studies conducted a detailed analysis of this topic from both the supply and demand ends, while this paper analyzed preschool education from a more comprehensive perspective and presented it in combination with data charts. (2) In terms of research methods, academic methods such as literature review method, chart analysis method, data analysis method, case analysis method and country comparison method were comprehensively used in this paper.

As for practical significance, preschool education is very important for the physical and mental growth of young children. From a physiological point of view, about 70-80% of human brain cells are formed before the age of 3, and 50% of the intelligence level is formed before the age of 4. According to the results of a long-term follow-up study conducted by American psychologist Bloom on more than 1,000 people, if the level of intellectual development of a 17-year-old is 100, then the level of intellectual development of a 4-year-old child is 50, and that of an 8-year-old child is 80, and the remaining 20 is obtained from 8-17 years old in 9 years. This means that the intellectual development of a person in the first 4 years is equal to the sum of the following 13 years.

2. DEMAND-SIDE ANALYSIS OF CHINA'S PRESCHOOL EDUCATION INDUSTRY

2.1. The policy side

The state actively advocates the development of preschool education and the development of private institutions. For a long time, China has attached great importance to education, but relatively speaking, K12 and higher education have been paid more attention by the state and the Ministry of Education. Related policies and regulations are commonplace, but the development of the preschool education industry has been ignored for a long time [1]. In recent years, the state has begun to pay attention to the development of preschool education, and has included the development of early education for children aged 0-3 in the overall plan of educational development. Advocate the simultaneous development of public and private enterprises, and optimize the allocation of preschool education resources. Construct an experimental zone for the reform and development of preschool education, and vigorously develop inclusive preschool education.

The state finances strongly support preschool education. Since 2010, the state began to pay attention to financial input in preschool education. The State Council included the funds for preschool education in the financial budgets of governments at all levels, among which the new education funds should be tilted toward pre-school education, and the financial expenditure items for preschool education mainly flowed into public preschool education institutions to promote their development. According to Figure 3, China's total investment in education in 2018 was 4,613.5 billion CNY, an increase of 8.39% over 2017. Of this total, 367.2 billion CNY was spent on preschool education nationwide, an increase of 12.79% over 2017, accounting for 7.96% of the country's educational spending.

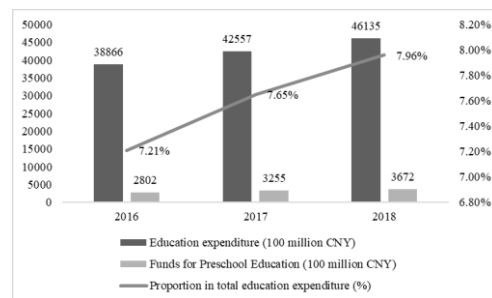


Figure 3 Statistical analysis of China's education expenditure from 2016 to 2018 (CNY; %)

Data source Ministry of Education of the People's Republic of China

2.2. The economic side

The living standards of the people have been improving. With the deepening of reform and opening up, the income level of Chinese residents continually increased. As shown in FIG. 4, in 2019, the national per

capita disposable income of residents reached 30,732.8 CNY, a year-on-year growth rate of 8.87%. Although it has declined compared with previous years, the growth rate is still not low. The CAGR of this index reached 9.01% from 2013 to 2019. The increase of income level also brings the change of consumption structure [2]. In 2019, China's per capita expenditure on education, culture and entertainment was 2,513 CNY, accounting for 11.66% of the total expenditure. The year-on-year growth rate of this indicator in 2019 was 12.89%, and the CAGR from 2013 to 2019 was 10.27%. The increase in the public's emphasis on education and culture will bring benefits to the education industry.

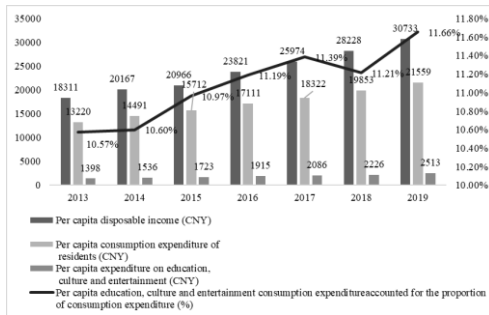


Figure 4 Analysis of per capita disposable income and education and culture expenditure in China from 2013 to 2019 (CNY; %)

Data source Statistics Bureau of the People's Republic of China

2.3. The social side

2.3.1. Fully open two-child policy brings a turning point for infant population decline

Allowing a second child would trigger another baby boom. Due to the continuous implementation of family planning, the population aged 0-14 in China has been declining. As shown in Figure 5, it reached the lowest point of 221.64 million in 2011, and then grew slowly with a growth rate of 0.1-0.5% in 2012 and 2013, and the proportion of total population also decreased from 20.27% in 2005 to 16.41% in 2013.

After the partial liberalization of the second-child policy in 2013, with the accelerated growth of the number of newborn babies, the population of 0-14 years old began to accelerate in 2014, with a growth rate of 1%, accounting for 16.49% of the total population, the highest proportion in 4 years. At the same time, the number of newborn babies in China has started a rapid growth model. The author predicts that with the full implementation of this policy, the number of newborn babies in the future will continue to increase and may even trigger the next baby boom, which will provide a solid foundation for the development of the preschool education industry.

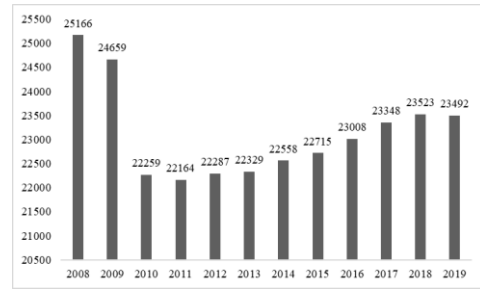


Figure 5 Population of 0-14 years old in China, 2008-2019(unit: 10,000)

Data source China Statistical Yearbook

2.3.2. The new generation of parents has a high level of education and changes in educational concepts

As Figure 6 displays, the educational level of Chinese residents is constantly improving, especially the number of people receiving higher education is constantly expanding. In 2019, the gross enrollment rate of higher education reached 51.6%, exceeding the average level of middle-and high-income countries.

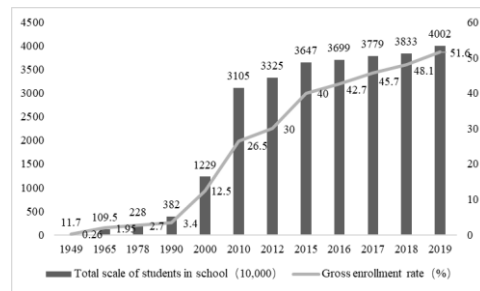


Figure 6 Analysis of the gross enrollment rate and the number of students in higher education (%; Ten thousand people)

Data source China Youth Daily

The new generation of parents' education concept has been upgraded. At present, people of fertile age are mainly born in the 1980s and 1990s. These are the two generations whose parents and children have enjoyed the dividends of the reform and opening up. Their income and wealth reserves are obviously higher than those of previous generations. China has always had a tradition of emphasizing education. As the "4+2+1" family structure is more and more become the mainstream mode of family, their children's education problem has become a top priority [3]. The world wave of information technology makes a lot of young people increasingly realize the importance of knowledge and education, according to FIG. 7, their ability to both more willingness to pay for preschool education, especially the quality of preschool education service.

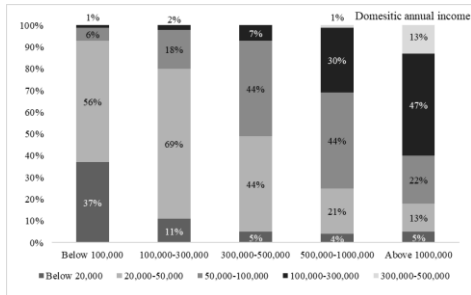


Figure 7 Family composition chart of childcare expenditure at different income levels

Data source *Maternal and Infant Parenting and Family Education Consumption Trend Insight Report on Weibo in 2018*

3. SUPPLY-SIDE ANALYSIS OF CHINA'S PRESCHOOL EDUCATION INDUSTRY

3.1. Teacher construction and preschool education concept

As FIG.8 displays, the gross enrollment rate of preschool education kindergartens in China has been increasing year by year from 2010 to 2020, and the problem of "difficulty in enrollment" has been solved to a certain extent. According to Figure 9, the number of kindergarten principals and full-time teachers in China maintained a steady growth trend from 1.305300 in 2010 to 2.8735000 in 2019 from 2010 to 2020. The growth rate gradually slowed from 14.6 percent in 2010 to 6.7 percent in 2019. At present, the proportion of private kindergartens in China is still relatively high, and the supply of public kindergartens with high quality and low price is insufficient. There is still a low proportion of public kindergartens in the development of preschool education in China, and the proportion of private kindergartens is too high. The pattern of "public and private kindergartens" has not yet formed, and "difficulties in entering kindergartens" are common. It is "difficult to enter public kindergartens", and the number of public kindergartens with high quality and low price is obviously insufficient, which cannot meet the needs of the public.

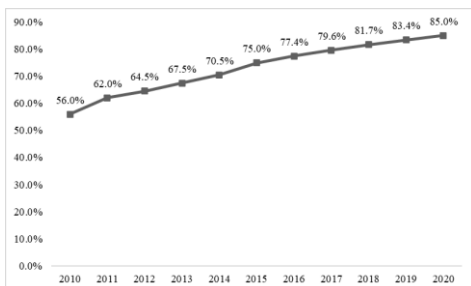


Figure 8 Gross enrollment rate of preschool education kindergartens in China (%)

Data source *2010-2020 National Educational Development Statistical Bulletin*

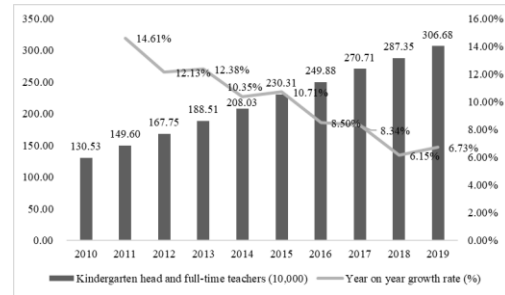


Figure 9 Number of Head and Full-time Teachers in Preschool Education Kindergartens in China and Its Growth Rate (ten thousand people; %)

Data source *China Education Statistics Yearbook*

At present, the most painful point in the establishment of China's pre-school education industry standards lies in the teachers and concepts.

The first major pain point is teachers. Preschool education teachers in China generally have a low educational background and lack of professional development platform after their employment [4]. However, in terms of recruitment, while professional requirements are getting higher and higher, the overall treatment of kindergarten teachers and staff is not high, the average monthly wage is even close to the minimum standard of living for urban residents. These problems are detrimental to the long-term healthy development of the preschool education industry. Taking Singapore as an example, where the national education is at an internationally leading level, the Singapore Pre-school Education Certification Committee divides the pre-school education professional teacher qualification certificates into three categories, CECCE, DECCE-T, and SDECCE, according to the stage characteristics of teacher development level and the growth needs of young children. The division of the three levels reflects the gradual improvement of the level of teachers. At the same time, the revision and promulgation of the pre-school education professional talent training curriculum standards ensure the quality of Singapore's preschool teachers.

Table 1 Teacher qualification levels and requirements for pre-primary education professionals in Singapore

Rank	Obtaining requirements
CECCE	Pass the general level exams in three subjects and obtain full credits, including English or mother tongue as the first language
DECCE-T	Pass the general level exams in five subjects and obtain full credits, including English or mother tongue as the first language
SDECCE	Bachelor's degree or a diploma from a polytechnic school, including English as the first language, and pass the general level examination, and complete the credit

The second major pain point is the lack of education concepts in our country. Taking the United States as an example, a complete pre-kindergarten education system consisting of two stages, Pre-K and K, has been formed, of which stage K has been incorporated into the compulsory education system of the United States. The standardization of preschool education in the United States consists of two parts: education model

standardization and curriculum standardization. The education model includes six major projects [5]. Curriculum standardization was established in the form of legislation through the Blueprint for Education Reform in 2010. Educational concepts play a guiding role in curriculum standardization, and the preschool education concepts in China need to be updated urgently.

Table 2. Different programs and characteristics of American preschool education model

Project	Features	Textbook
Montessori	Emphasize independence and respect for children	Let children follow the development of the heart
Waldorf	Focus on practice and innovation	Combination of values and practice, emphasizing imagination
Reggio Emilia	Respect, responsibility and sociality as the principle, based on interest	Through exploration and discovery, self-directed curriculum implementation plan
High Scope	Actively participate in learning	Comprehensive observation and assessment of child development
Bank Street	Focus on understanding the world	The combination of the young and the young pays attention to the education of whole personality
Parent Coops	Game oriented	Pay attention to the interaction between parents and children

With the gradual establishment of preschool education practice standards, the pain points of teachers will gradually be solved. In 2012, my country issued the relevant documents, which emphasized the need to strengthen teacher training and implement a strict qualification system for kindergarten teachers. In 2015, Professional Standards for Kindergarten Principal were issued for kindergarten principals, which put forward requirements for principals in areas such as planning

kindergarten development and leading kindergarten work, and formulated qualification standards and training standards for kindergarten principals. As shown in Table 3, both full-day kindergartens and half-day kindergartens have the situation of insufficient teaching staff and too many children. In view of the above situation, the Ministry of Education issued the official document in 2013, which stipulates the size of classes and staffing requirements for all ages in kindergartens,

as shown in Table 4 [6]. The author thinks that the establishment of the standards will greatly improve the level of preschool teachers and the quality of preschool

education in China will be significantly improved in the long run.

Table 3. Proportion of staff and children in kindergartens of different service types

Service type	Ratio of teachers and staff to children in the whole kindergarten	The ratio of nurses to children in the whole kindergarten
Full-time	1 : 5 ~ 1 : 7	1 : 7 ~ 1 : 9
Half-day	1 : 8 ~ 1 : 10	1 : 11 ~ 1 : 13

Table 4. Kindergarten class size and staffing standards for full-time teachers and caregivers

Age class	Class size	Full-time		Half-day	
		Full-time	Caregivers	Full-time	Caregivers
Year 3 ~ 4	20 ~ 25	2	1	2	If possible, one caregiver should be assigned
Year 4 ~ 5	25 ~ 30	2	1	2	
Year 5 ~ 6	30 ~ 35	2	1	2	
Mixed age class	< 30	2	1	2 ~ 3	

3.2. Content standardization and teaching diversification

This article analyzes the standardization trend of the preschool education industry from the three perspectives of demand standardization, content standardization, and service standardization shown in FIG.10. In the future, the preschool education industry should coexist with standardization and diversification, and on the basis of standardization of the preschool education concept and service, the specialty and differentiation of courses and products can be realized [7]. To enhance the level of industry standardization will drive a comprehensive upgrade of preschool education products and content.

From the perspective of service standardization, the teaching process is mainly realized by teachers, whose teaching and guidance methods directly affect the educational effect. Compared with other fields of education, the quality of teachers is more uneven. The future service standardization problem needs to be solved urgently. From the content side, K12, vocational education, and higher education all have systematic teaching materials and outlines, while the content of preschool education is chaotic and disorderly. From the perspective of demand standardization, K12, vocational education, and higher education have clear goals and rigid needs. The just requirement of K12 is to raise points, the rigid requirement of higher education is academic qualifications, and the just requirement of vocational education is the mastery of certificates or professional skills [8]. The needs and evaluation criteria of preschool education are more diversified.

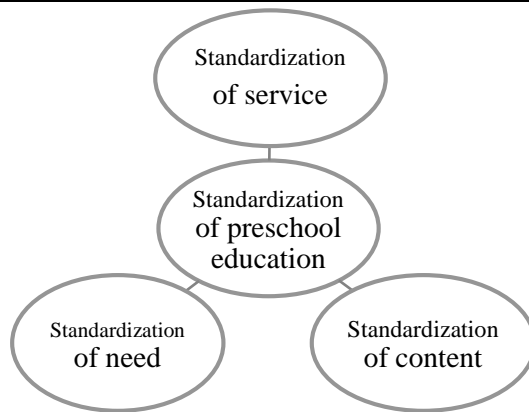


Figure 10 The trend of China's preschool education standardization

At present, the expansion rate of direct-run kindergartens in China is slow, mainly restricted by the kindergarten license policy. The basic approval procedures of this policy are as follows: firstly, apply for the establishment of a kindergarten, and submit the application report and the required materials to the education bureau of the county (city, district). After the preparation work is basically completed, the applicant shall make a formal application to the county (city, district) Education Bureau and submit the materials needed for the formal establishment application. The county (city, district) Education Bureau will issue a license to the approved kindergarten and report it to the municipal education administrative department for record. The establishment of kindergartens is strictly subject to the supervision of the government and the assessment and audit of the local education department, and is restricted by the restriction that "private kindergartens shall not open sub-kindergartens".

Therefore, it is extremely difficult for private kindergartens to replicate in different places in the way of direct operation.

Among them, the biggest difficulty lies in the educational land. As for the newly-built residential areas, since the state requires that the newly-built residential areas must be equipped with kindergartens, the area of educational land has already been stipulated in the auction of residential real estate land, and so on, provided that the national standards for the construction of kindergartens are strictly observed, then there are no significant barriers to licensing teaching. However, it will be difficult to apply for permission to open a new non-residential kindergarten if there is no deep local resources. At present, a large number of commercial preschool are in the form of parent-child parks and early education centers.

4. ANALYSIS ON THE DEVELOPMENT TREND OF PRESCHOOL EDUCATION IN CHINA

4.1. Preschool education informatization construction and home-school interaction

Preschool education informatization is the process of using computer multimedia and network information technology to promote the reform and development of preschool in the field of pre-school education (education management, education teaching and education research). See FIG.11 for the industrial chain of educational informatization. The upstream is the telecom operator that creates the basic conditions for informatization, and the mid-stream is the technology service provider and content service provider that provides educational information platform and resources, and the downstream is the audience end of educational informatization [9].

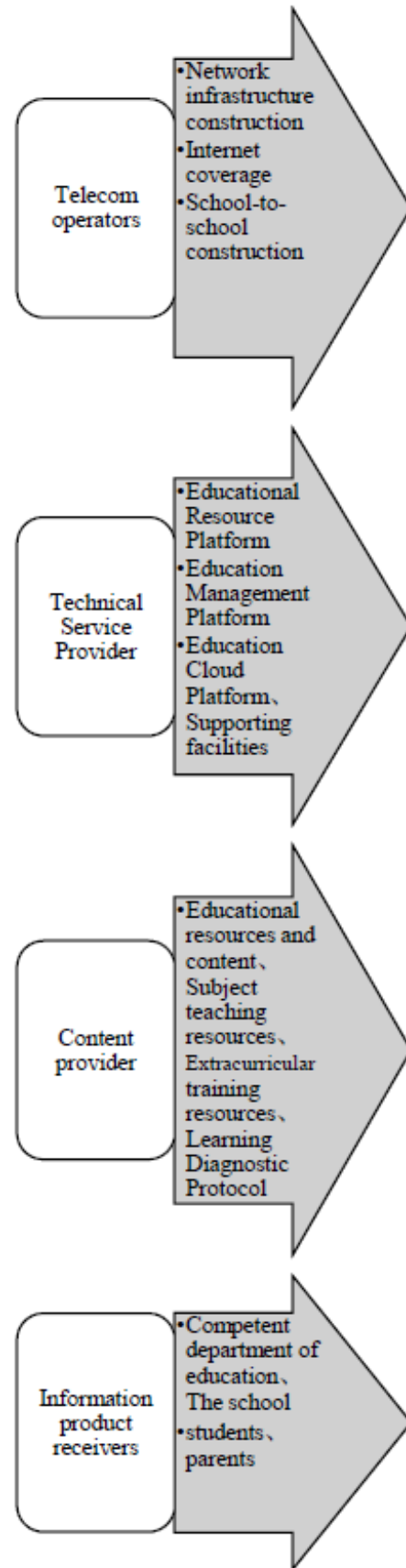


Figure 11 Schematic diagram of the industrial chain of preschool education informatization

The growing environment of the new generation of parents provides a guarantee for the consumption base and consumption demand of the information industry of preschool education. As the main consumer group of preschool education informatization, the new generation of parents is a generation growing with the Internet [10]. As Figure 12 displays, more than 50% of China's mobile Internet users are between 20 and 49 years old. The Internet habits of parents aged 20 to 49 are also filtering into early education for their children.

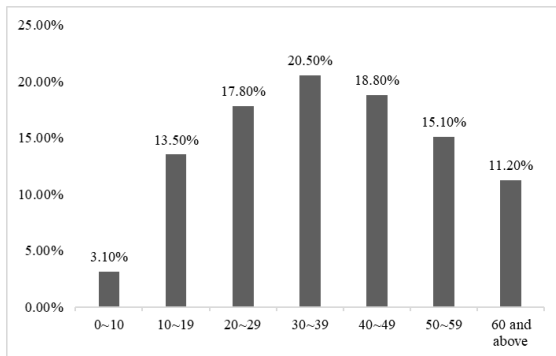


Figure 12 Age structure of China's Internet users (as of Dec 2020)

Data source CNNIC

The home-school interactive platform is one of the most easily standardized and large-scale subdivisions in the field of preschool education information. Both parents and kindergarten teachers can fulfill their needs through its APP. Kindergarten teachers can use it as a tool to manage their classes, while parents can keep in touch with the kindergarten and record and share their children's development via its application. In addition to parents who want to be able to interact with teachers online and communicate daily, there is also a huge demand for communication and interaction between parents or between parents in different places. This high demand brings about a high degree of user viscosity. The core of the home-school interactive platform is traffic monetization. The platform uses a B2B2C model to simultaneously cut into B-end and C-end users, and quickly occupy the entrance through the free business model of basic service functions. In the future, it will be monetized through accumulated traffic.

4.2. Case study: Vitron shares

The number of leading parks and excellent geographic coverage have formed offline channel advantages and industry first-mover advantages. As of the end of 2017, the kindergarten brand under Vitron Co., Ltd. has nearly 5,000 franchised kindergartens. It is currently the company that manages the largest number of kindergartens in the preschool education industry. The company's current kindergartens are mainly concentrated in first- and second-tier cities represented by Beijing. Located in the high-end kindergarten.

After the merger and acquisition investment management, multi-brand management, preschool assets operation experience is increasingly mature. From 2015 to 2017, the actual profits of Hongying Education and Golden Cradle greatly exceeded the M&A performance commitment. In 2017, the company successively completed the merger and acquisition of Ker Education and Dingqi Preschool Education, forming the layout of four major preschool education brands within the group, and further expanding the scale and coverage area of the kindergarten. As shown in Figure 13, from June 2018 to June 2020, the main business income and gross profit margin in other fiscal years remained at a relatively high level, except in 2020, which was significantly reduced due to the impact of the epidemic.

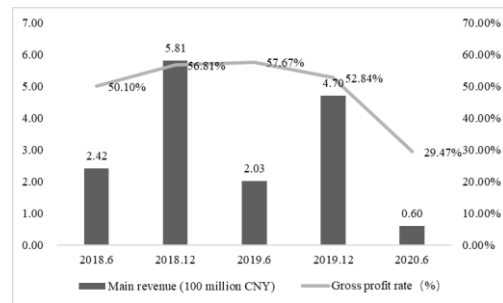


Figure 13 Main Revenue and Gross Profits of Children's Education Service Industry of Vitron Company (CNY 100 million; %)

Data source

<http://f10.eastmoney.com/businessanalysis/index?type=web&code=sz002308#>

Its preschool education brand has a self-developed kindergarten curriculum system. The 3S curriculum independently developed by Hongying Education adjusts the educational content and expression form according to the growing needs of parents and continuously upgrades and optimizes it. It has successively launched high-quality courses such as "Sunshine Sports", "Playing Beauty Time" and "Discovering Similarities".

In 2017, Golden Cradle Research Institute established a company independently and upgraded to Vitron Potential Research Institute. Focusing on the unique education concept of Golden Cradle and combining with the world's excellent education forms and scientific and technological means, it enriches the types of teaching AIDS, upgrades its education system as a whole, and implements the productization, marketization and internationalization of curriculum contents.

Form a systematic preschool education industry ecological advantage. The company has built a Starwood-style multi-brand preschool education management group, and gradually improved the ecological system layout in the preschool education industry. The online multi-flow platform layout has

been formed, and the offline development is mainly based on Hongying Education, Golden Cradle, Kerr Education and Dingqi Preschool Layout of the operation service platform, and establish strategic partnerships with professional companies in various sub-fields, such as Ruiyi, Tila Reading, Huameng Sports, Wonder Workshop, Cloud School, etc., to initially build an online and offline integrated preschool education ecosystem. Relying on the existing system, the company will continue to seek investment and cooperation opportunities in the field of children's growth in the future, explore new business models, and further open up the entrance to the family side of the kindergarten, and build a children's growth platform.

The R&D advantages of preschool informatization and smart preschool education and the accumulation of children's growth data. The company's Golden Cradle has accumulated more than 20 years of children's growth data. At present, the company's smart preschool education team and Baidu and other top artificial intelligence experts are constantly advancing the accumulation and analysis of children's growth data. In the future, children's growth data will be used. The accumulation will gradually become the company's main core competitiveness, helping children achieve more accurate and personalized education.

5. CONCLUSION

5.1. Summary

This study analyzes the current situation of the preschool education industry from the two aspects of supply and demand.

At the demand-side level: 1. In the policy aspect, China regarding the pre-school education the attention degree enhances gradually, has promulgated more and more pre-school education development the good policy. 2. In terms of economy, the continuous improvement of the country's economic level and the people's emphasis on education from ancient times to the present have also increased the public's emphasis on pre-school education. 3. In terms of society, the fully open two-child policy has brought a rich source of students for preschool education. The general increase in the education level of residents and the improvement of economic conditions have also caused more and more attention to preschool education.

At the supply-side level, the author discusses from the aspects of citizen-run kindergarten, kindergarten teacher team construction and kindergarten school quality. 1. The proportion of private kindergartens is very high, and the number of public kindergartens with high quality and low price is relatively small. 2. The level of teachers is generally low, and the level of remuneration has not been improved, so that the

strength of teachers cannot be guaranteed. 3. There is no accurate quantification of scores in preschool education, and the diversification of parents' judgment conditions makes the supervision and improvement of kindergartens lack accurate standards.

Based on the analysis of the status quo, the author further explored the future development trend of preschool education. 1. Informatization construction and home-school interaction level: The development of Internet technology has promoted the development of preschool education, and parents' habit of using the Internet has penetrated into all aspects of children's education. The resulting home-school interconnection on the one hand strengthens the communication between parents and teachers, on the other hand, it also provides a huge market for the operating platform. 2. This research takes Vitron as a typical case analysis. It has a complete kindergarten teaching system. Based on its own company's R&D advantages and growth data, it continuously develops new programs and explores more accurate development directions for preschool education.

Based on this, the author gives the following suggestions: 1. Establish an inclusive development mechanism, on the one hand, continue to increase institutional investment to provide stable financial support for the development of preschool education; on the other hand, establish a long-term mechanism for preschool education quality supervision. To provide high-quality preschool education services for young children. 2. Continue to expand the supply of preschool education resources. On the one hand, give priority to the development of preschool education in remote, poor and left-behind children's areas, and strive to increase the penetration rate of preschool education; on the other hand, scientifically plan the distribution of urban preschool education resources based on the birth rate and population flow trends. 3. Build a high-quality professional teacher team, adjust the teacher recruitment mechanism, and innovate the teacher supplement mechanism. The local government can strengthen cooperation with local normal colleges and universities based on local pre-school education's demand for teachers.

5.2. Shortcomings and prospects

Due to the limitations of space and data, this paper did not carry out a detailed discussion on the qualitative analysis of the case analysis. Therefore, the author will conduct an in-depth analysis along the operational advantages and qualitative analysis direction of typical head preschool education institutions in the field of preschool education in the future.

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