Research on Curriculum Development in Regional Senior Universities from the Perspective of Supply and Demand

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Abstract: *With the deepening population aging and the full popularization of the concept of lifelong learning, education for older adults is becoming an important way to improve public welfare services and enrich the spiritual and cultural life of older adults. The District Senior University as the main front for education for older adults in the region has been expanding the school-running scale, and the enthusiasm for learning among learners keeps rising. Imbalance problems between supply and demand have gradually emerged during the process of curriculum development and operation. From the perspective of supply-demand relationship, based on the data of campus course enrollment, the survey results of learners' course needs and the application by teachers for new courses, we analyzed the current situation of curriculum operation from two aspects of demand and supply; identified practical dilemmas at different aspects such as course quantity, structure, research and development, and support; proposed corresponding optimization paths (course expansion, structural optimization, process standardization, and support upgrading) so that there can be a dynamic balance between supply and demand within the curriculum system, providing practical reference for curriculum development and high-quality development in similar senior universities.*

Keywords: *Perspective of Supply and Demand; Senior University; Curriculum Development; Curriculum Optimization*

Introduction

According to the data provided by the National Bureau of Statistics: At the end of 2025, the total population in China reaches 1,404.89 million, including 323.38 million aged over 60 and 223.65 million aged over 65 (increase of 13.07 million and 3.42 million respectively than last year)[1]; with the growth of the larger number of older adults, some researchers pointed out that the learning needs of older adults show tendencies towards diversification, personalization, and high quality; How to improve the match between the supply and demand of curricula in education for older adults become the key issue in solving the development bottlenecks of education for older adults, improving the learning quality and promote the implementation of a positive outlook on aging[2] . In this paper, taking a District Senior University in Shanghai as a case study, based on learner questionnaires, enrollment data and new course application materials, we analyze the practical dilemma of curriculum development in education for older adults from both perspectives of supply and demand, propose systematic optimization paths according to relevant research results, which can provide practical references for improving the quality and efficiency of regional curricula in education for older adults.

1. Current Supply and Demand Status of Courses at Senior Universities

Mainly using the online course registration data during the spring 2026 term at a District Senior University in Shanghai; 794 learners questionnaire about their course needs; Teachers application for new courses. We take an approach from two aspects (demand side and supply side): comprehensively analyzing the actual operation of courses in education for older adults at the campus, summarizing general characteristics of supply-demand matching.

1.1 Demand Side: Analysis of the Overall Characteristics of Learners' Course Needs

There is 54 classes available for enrollment in the spring 2026 semester at the District Senior University in Shanghai including 28 basic classes and 26 advanced classes. There was a flash sale phenomenon on the courses during the launch of online registration with 94% of all classes across the school completing their enrolment within 15 minutes but some niche courses register slowly. Two major trends of learners' course choice preferences are traditional culture and sports courses and digital and intelligent technology courses. Courses like Tai Chi, classical dance, guzheng, opera, calligraphy and painting have always been on the top of the popularity list; Digital courses like AI applications, short video production, and smart device use surge in popularity become an emerging popular choice. Regarding demand survey for the 18 new courses which will be offered in the autumn semester, according to the 794 valid learner questionnaires, learners' demands for new courses are diverse and mostly concentrate on three directions: practical life skills, cultural health and wellness experiences, leisure and cognitive stimulation. Learners usually choose courses that are very practical, easy to understand and closely related to daily life; Western pastry baking, practical English, intangible cultural heritage handicrafts, physical performance are in high demand.

1.2 Supply Side: Overview of the Comprehensive Situation of Course Supply at the Campus

Tiered teaching takes place on campus where some classes take a mixed online and offline teaching mode but traditional culture, sports and arts courses prevail with slow updating of course categories and obvious polarization between popular and unpopular courses reflecting the lack of flexibility in course layout. The teachers show great enthusiasm when providing courses and they have submitted 18 new courses in total from various fields. But there exist many issues: Some courses are too theoretical exceeding their appropriate difficulty levels not conforming to the characteristic of older learners' learning, Only 4 new courses will be piloted this autumn semester; Hardware facilities has become the bottleneck for expansion of courses because the classroom functions at the campus are all single-function without dedicated space or supporting equipment for baking, handicrafts and other activities which makes it hard to conduct a lot of practical/experiential courses.

1.3 Overall Situation of Course Supply-Demand Matching

According to the information obtained by both demand side and supply side, we found some features such as inadequate total supply and no supply for potential demand for courses in this Senior University: Popular courses (Tai Chi, classical dance, guzheng, digital and intelligent applications, short video production) are completely full within seconds or minutes when they open registration which means these courses satisfy the core needs of learners but the number of existing classes at the campus is limited with an obvious contradiction between supply and demand, there is a huge shortage of places; There are many potential learners for other courses (Western pastry baking, practical English for older adults, mental health, intangible cultural heritage handicrafts). Due to venue, teaching staff and course review restriction, the school hasn't provided relevant courses so far, learners' new demands can't be satisfied and a "disconnect" appears between demand and supply.

Some theory classes on literature and history and health preservation have very few registrants with a certain amount of remaining spots meaning course resources are not used up completely, which aggravates the situation of supply demand mismatch. As to matching structure: The proportion of traditional culture, sports, and arts courses takes up a relatively large proportion in the existing supply but the supply of emerging courses meeting the modern lifestyle needs of older adults adapting to new consumption and new life scenarios lagging behind making it hard to meet the diversified and different learning demands from current learners, there is still much room for improvement regarding the level of supply-demand matching.

2. Main Dilemmas in Curriculum Development from the Perspective of Supply and Demand

From the perspective of supply-demand balance, the dilemmas currently facing curriculum development at senior universities are mainly in four aspects: course quantity, course structure, curriculum development, and course support.

2.1 Insufficient Supply in Course Quantity and a Large Shortage of Places

Currently, there are 54 classes open for enrollment on our campus, and the "flash sale" phenomenon at online registration obviously reflects the fact that the number of intended learners far exceeds the total number of existing places: There is an obvious gap in the total number of regular classes, and the overall class scale cannot meet the huge number of learners. The so-called "flash sale" refers to the online registration situation where popular courses are snapped up within a very short period of time once the registration channel opens, and many learners are automatically blocked by the system because of being full of quota and not able to enter the next course selection process. This intuitively reflects a great quantity gap between the supply of places and registration demand. As for the traditional culture and sports courses and digital and intelligent technology courses with the broadest audience among all course sections, their enrollment quotas per class do not set up additional parallel classes to divert learners (so that the same course can only accommodate a fixed number of learners). A large number of new students who are willing to learn cannot get admission qualifications. Regarding the response from the school, facing the prominent contradiction of tight places and high demand for popular classes, the school is constrained by its rigid conditions such as venues and teaching staff in the short term, making it hard to quickly expand classes, therefore it cannot promptly absorb the constantly accumulated registration demand. Looking at the long-term operation of the school, relying solely on the existing number of classes can no longer adapt to the growing enrollment demand of regional education for older adults, the insufficient total number of places has become a foundational shortcoming limiting the expansion of the coverage of education by the school, which is also the most intuitive dilemma that urgently needs to be solved now.

2.2 The Course Structure Leans Toward Leisure and Entertainment, with Insufficient Supply for Diverse Needs

There are four major categories of campus courses, namely traditional culture, sports and arts courses, digital and intelligent technology application courses, practical life and aesthetic education courses and cultural general knowledge courses. Traditional culture, sports and arts courses account for the biggest proportion such as Tai Chi, various types of dance, guzheng, Shanghai opera, Yue opera, calligraphy, traditional Chinese painting, and instrumental and opera courses (such as the electronic wind instrument and saxophone), Digital and Intelligent Technology courses are new popular courses with content of Silver-Haired AI Life, short video production, mobile photography, practical smartphone operation, and AI-based traditional Chinese medicine health preservation; Practical life and aesthetic education has makeup and styling, intangible cultural heritage handicrafts, and communicative English; Cultural general knowledge has a few classes in poetry recitation, classical music, and cultural tourism appreciation. We see from the present class offerings that the course category is serious homogeneity and resource concentration is excessive in entertainment and art. There are almost no courses about rigid needs like mental health, legal rights protection, volunteer services for older adults, and grandparenting education, which cannot meet the multi-layered needs of older adults in health protection and social participation. Meanwhile, the overall supply of emerging courses is not enough due to having only a few digital and intelligent technology classes, making it hard to correspond to the booming market demand shown by course registration. Courses focusing on social participation are severely lacking: all existing courses focus on personal leisure and life skills, there is a lack of courses on community governance, volunteer service for older adults, and public welfare services, confining older adults to "enjoying life in old age", neglecting their higher level learning need of "contributing in old age". Focuses on entertainment and leisure while neglecting practical support and social empowerment, the structural mismatch between supply and demand is obvious.

2.3 The Curriculum Development Process Is Not Sound, with Shortcomings in Preliminary Research and Post-Course Iteration

All aspects involved in the process of curriculum development including needs research, course design, lesson plan writing, and implementation optimization. Deficiencies exist in the process of curriculum development at the campus currently: Firstly, we haven't established a curriculum development mechanism with "needs research first" so that there is a certain level of blindness. When applying for new courses or designing courses, teachers only make course plans based on their own professional expertise and personal ideas without conducting preliminary research considering the overall needs, learning abilities, and interest preferences of learners at the campus. Some proposed courses are too difficult, whose content doesn't match the lives of older adults, making it inherently

inappropriate for learners from the very beginning, thereby wasting curriculum development resources. Secondly, the ability for secondary course optimization is weak. After courses are implemented and run, there lacks routine classroom feedback and content iteration. The content of some old courses updates slowly, teaching methods change little. Courses "emphasize offering but neglect optimization". Research and development stops at the stage of course offering, lack of polishing and upgrade over its whole life cycle.

2.4 The Supporting Guarantee System for Courses Is Incomplete, with Both Software and Hardware Conditions Restricted

Software and hardware facilities are the basic guarantees for curriculum development, operation and iteration. The current course guarantee system at the campus become a rigid constraint restricting curriculum development. Hardware facilities: the biggest problem is lack of dedicated venues and equipment. Existing classrooms have relative single functions, can only meet the requirements of traditional teaching without having functional space such as baking classrooms, professional handicraft classrooms or large-scale work exhibition spaces. Some courses (Western pastry baking, creative handicrafts, immersive experience courses), due to insufficient venue conditions, cannot be carried out, restricting the expansion of course types. Dedicated equipment for some instrumental music, photography, and digital courses are not fully equipped, making it difficult to meet the actual operational needs in the teaching process, affecting the teaching quality of existing courses. Teaching staff and software: Full-time teachers in education for older adults are relatively few, and most courses rely on part-time teachers. There is little training related to the laws of teaching for older adults, curriculum development methods, and classroom design techniques; some teachers do not systematically understand the learning characteristics, receptivity, and interest preferences of older learners, and they need to improve their abilities in course design, classroom organization, and pacing control.

3. Optimization Paths for Curriculum Development Oriented Toward Supply-Demand Equilibrium

To address the present supply-demand imbalance dilemma in the courses of senior universities by taking dynamic supply-demand equilibrium as its main goal based on the actual situation of school operation at the campus, learners' needs, and teaching staff and hardware conditions, formulate the optimization path from the aspects of class expansion, structural adjustment, research and development standardization, and support upgrading that can dynamically match the course supply capacity with learners' learning needs and fully optimize the curriculum development system; these four dimensions complement each other and progress together, thereby providing an overall framework for optimizing the curriculum development towards supply-demand equilibrium—overcoming the shortcomings and constraints in the current curriculum development through systematic adjustments, promote the change of curriculum construction at senior universities from passive response to demand to actively adapting to demand, achieving positive interaction and dynamic balance between course supply and learners' needs.

3.1 Expanding Classes to Alleviate the Quantitative Contradiction Between Supply and Demand

To solve the problem of insufficient total places and difficulty of getting a place in popular courses, the main solutions include scientific expansion of capacity and improvement of efficiency via revitalizing existing teaching resources and filling up the supply gap in terms of quantity: Firstly, adding parallel classes for popular courses. For those core courses which are always full (such as Tai Chi, classical dance, guzheng, AI intelligence, short video production), we need to add parallel classes if there is enough teaching staff and classroom conditions, maximizing the carrying capacity of existing venues and teaching staff, increasing the number of places in popular courses at once and easing the pressure of new student registration. Secondly, integrating and optimizing niche and less popular courses. Sort out niche courses suffering from insufficient enrollment and idle resources over a long time, merging classes with similar contents and overlapping audience; for courses losing learners still, the campus should gradually reduce class numbers or suspend them, allocating the vacated classrooms and teaching staff to popular courses and newly added courses to improve the overall resource utilization efficiency. Thirdly, enriching course formats to divert the pressure of regular registration. Besides fixed long-term classes, the campus should also add lightweight courses like short-term

experiential courses, weekend interest classes and public welfare courses during winter and summer vacations. Short-term courses have short cycle, low threshold and high flexibility; they can meet the needs of some learners wanting to try something new and fragmentary learning while diverting the registration pressure on long-term regular classes.

3.2 Adjusting the Course Structure to Precisely Match Learners' Needs

The three elements of the learning needs of contemporary older adults in China that some researchers believe as follows: Need to pursue quality of life; Need to pursue interpersonal interaction; Need to pursue social contribution. In which the need to pursue quality of life is the primary and basic need while the need to pursue interpersonal interaction is a higher level need and the need to pursue social contribution is the highest-level need[3]Therefore, in rebuilding the curriculum system based on learner needs, we should solve the problem of category misalignment, homogenization, and imbalance of old to new courses ratio to perfectly match the course supply and learner needs. Firstly, combine similar courses to break the homogenization dilemma. Fully sort out existing courses and courses applied for by teachers at our campus, integrate and classify the repeatedly offered AI courses and traditional culture and sports courses, merge classes with very similar content. For remaining courses of the same type, differentiate their positions and clarify the features of each class to avoid internal competition and waste of resources. Secondly, optimize the overall category layout according to the four major course categories. Strengthen the flagship traditional culture, sports, and arts courses, expand the digital and intelligent technology application courses, refine practical life and aesthetic education courses, and optimize high-quality cultural general knowledge courses so as to build a well-structured and comprehensively covering curriculum system. Strictly control the proportion of purely theoretical courses and encourage all courses to add practical operation, interaction, and experiential components to match the learning characteristics of older learners. Compared with traditional classroom teaching, due to the decline of physical strength and memory experienced by older adults, various forms of teaching (experiential teaching and study tours) are more compatible with the physical and mental characteristics of older adults and are more conducive to meeting the learning needs of older adults for social integration[4]. Thirdly accelerate the implementation of new courses to meet potential learning needs. Make a learner needs list and prioritize adding courses which are in high demand among learners in the questionnaire and meet the condition for offering in the course plan. Take on new learner demands actively and fill the gap of potential courses' supply.

3.3 Standardizing the Research and Development Process and Improving the Dynamic Adjustment Mechanism for Course Iteration

We must standardize and promote the entire process of curriculum development in our campus, reverse the situation of blind research and development, single-tiered stratification, and lack of optimization, comprehensively improve the quality and adaptability of curriculum development. First, we need to build up a research and development mechanism putting "needs research first", studying learner's needs as the first step of curriculum development; each semester, the campus conducts regular questionnaire surveys, symposiums and classroom visits to get learners' intention of course selection and suggestions for course improvements. When applying new courses, teachers have to write proposals according to needs data, instead of blindly offering courses due to their own preferences so that curriculum development can always focus on learner needs. Second, we need to optimize the course review and iteration system. By establishing a course lifecycle management system considering factors such as course selection rate, completion rate, satisfaction, and social influence, initiate optimization or exit procedures to make sure courses keep pace with the times and always accurately adapting to the needs of older adults[5]. Third, we need to strengthen the design of course outcomes. All courses follow the teaching management requirement to synchronize planning content for display of learning outcome at the development stage, combining classroom teaching with performances, works exhibition, and practical activities to increase the interest and demonstrativeness of courses and strengthen learners' sense of gain from learning.

3.4 Improving the Software and Hardware Guarantee System and Advancing Venue Optimization and Teaching Staff Cultivation and Reserve

It is necessary that the campus fills hardware shortages, strengthens teaching staff development, builds a comprehensive guarantee system to provide a solid foundation for curriculum development and long-term operation. Firstly, we must make full plans for teaching venues and dedicated equipment.

In accordance with the curriculum development plan, the campus should renovate ordinary classrooms into multifunctional practical operation classrooms, handicraft classrooms or performance spaces; according to the needs of popular new courses, the campus should gradually equip baking equipment, handicraft tools, digital devices, and professional audio-visual equipment. If there are no venues available for renovation within a short period of time, the campus can temporarily solve this problem by using mobile classrooms and off-campus practice sites to gradually overcome hardware limitations. Secondly, the campus should strengthen the development and reserve of teaching staff. High-level teaching staff is an important guarantee for achieving high-quality development in education for older adults,on one hand, the campus should frequently conduct specialized training in teaching for older adults, curriculum design, and classroom management to enhance the curriculum development capability and teaching level of existing teachers in education for older adults. On the other hand, the campus should establish a reserve pool of off-campus teachers, attract professionals from different fields such as culture, art, digital technology, and handicraft skills, enrich the part-time teacher team, and constantly improve the assessment and incentive systems for part-time teachers to stabilize the teaching staff. Cultivating and encouraging young-old adults to be the main body of curriculum implementation in education for older adults is also an effective solution to the issue of teacher shortage when implementing education for older adults.

4. Conclusion

There is a good educational atmosphere and very enthusiastic learners at the District Senior University in Shanghai; traditional courses are strong with solid foundations while digital and intelligent emerging courses develop well and play an important role in regional education for older adults. Because of all sorts of reasons such as the total number of places, course structure, research and development capacity, software and hardware, there is a big imbalance between supply and demand in the campus courses, becoming the key bottleneck limiting the improvement of school-running quality. The essence of curriculum development in senior universities is the dynamic match between supply and demand. In the future, according to the actual learning needs of the regional older adult population, it is necessary for the campus to solve the quantity gap by expanding capacity and incrementally growing, solve the category misalignment by adjusting structures, improving course quality by standardizing processes, consolidating the foundation for development comprehensively, optimizing through a series of measures, constantly optimize the curriculum system and improve the school-running level, so that education for older adults really matches older adults' lives, their interests and their learning ability, constantly meeting the pursuit of a better life and lifelong learning among the vast majority of older learners, promoting the steady advance of regional education for older adults.

References

[1] Wang Pingping. China's total population reached 1,404.89 million in 2025, and high-quality population development continues to advance. (2026-01-19).
[2] Xu Wenqing. Improving the supply-demand matching mechanism for courses to enhance the learning quality of education for older adults. Talent and Employment, 2026, (2): 80.
[3] Chen Wenjiao, Liu Qiaoqiao, Xiao Yang. Curriculum development of community education for older adults based on the learning needs of contemporary older adults. Adult Education, 2021, 41(7): 35-40.
[4] Li Kun, Lu Jiansheng, Gao Qian. Construction of a demand model for education for older adults and reflections on the supply side from the perspective of active aging. China Adult Education, 2022, (10): 8-13.
[5] Wang Shufang, Ma Lihua. Conceptual optimization and practical paths for curriculum construction in education for older adults from the perspective of empowerment theory. Adult Education, 2023, 43(4): 15-19.